Daffodil International University

PERSONAL FINANCE MANAGEMENT SYSTEM

A Project Report

Submitted in partial fulfillment of the requirements for degree of

Msc in Software Engineering

By

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Approval

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DECLARATION

I hereby declare that this project under supervision of Md. Khaled Sohel, Assistant Professor, Department of Software Engineering, Daffodil International University. I also declare that neither this project nor any part of this has been submitted elsewhere for award of any degree.

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Abstract

The report is about Personal Finance Management System. Personal Finance Management is task people done manually all the time by keeping note on personal notebook or in memory. Now people interested to adopt a new digital computerized system to avoid inaccuracy and getting more project on their daily life expenses and income. This project report mentioned all issues and solution related with traditional personal finance management. This project help end user to store their personal financial transaction, accounts and budgets information along with getting report on income, expense and budgets based on specific time frame. User will able to export their necessary information on several format such as excel, pdf.

Development of application should follow pre organized structured way by maintaining rules and regulations. There are different type of methodology will reflect that regulations and rules. DSDM Atern under hood of agile methodology used to develop this project. So, whole development of this project will follow DSDM Atern which is not limited but include sequential step such as planning, feasibility, foundation, exploration, engineering, development and implementation.

This project report can be treated as user manual to know how to use this application. Developer will be benefited by this report to know how further development can be happen.

Acknowledgment

First of all I am really grateful to almighty Allah who provide me patience to work hard to achieve my desire to finish this project successfully.

I would really like to provide special thanks to my honorable teacher and supervisor Mohammad Khaled Sohel, Asst. Professor of Daffodil International University. Without his inspiration and regular mentorship, it was not possible to successful ending of this project. At development phase his close attention and guideline help me to finish this project in a structured way.

I must need to express my gratitude to the people who helped me at several way to develop this project and prepare project report. With their help on interview session and questionaries' project requirement get a solid base at pre stage of development.

I also would be grateful to all of my course mate for their continuous support and motivation

Finally, I would like to thank Software Engineering Department of "Bornomala IT Limited" – a leading software solution provider, for giving me opportunities to utilize their lab along with market research data.

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CHAPTER 1: INTRODUCTION

From beginning of mankind, human being struggle to live. General flow of life always indicates two sequential step as survive and then grow. For this two step mankind always need to keep track of their earning and expense not only for motivation rather to prepare execution plan for future survival and continuous growth. Traditionally management of this step called personal finance management which was maintained manually by using keeping note either paper or human brain memory and then applied calculation.

Now, this is an era of technology where people have less time to engage with some regular staff where expectation of using digitized system to manage their life more efficiently. Personal finance management is not out of that box. People interested to create budgets and keep track of their income and expenses. More specifically projection of their current personal financial status help them to make their decision in a manner to main well survive and then growth.

Computerized personal finance management is an automated system to generate budgets and reports based on user financial input of expenses and incomes. And they want suggestion to improve their outcomes by analyzing their data.

The main key feature of this system are:

- User Friendly
- Easy to operate
- Track of personal financial transaction.
- Track of income and expense.
- Budgeting.
- Alerting.
- Overall projection of current state.
- Time specific reports.
- Personal Financial Goal Management.

This expectation can be covered if system/application can be use in both web and mobile devices. So fulfill these kind of responsibility we decided to bring this application in a manner to usable at web and mobile platform. This solution will be working as Software as Service Platform. We named our system Personal Finance Management.

CHAPTER 2: FUNDAMENTAL STUDY

2.1 Proposal:

Title of Project: Personal Finance Management System

Developed by:

Md Khorshed Alam

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Scope of Project:

All type of people who can use mobile, computer and internet.

Project duration: Four months, approximately.

2.1.1 Current condition:

Currently targeted user base using manual or sub manual system to track and trace their personal financial transaction. Facing several obstacles to getting projection and time specific reports. Accuracy of using current procedure is not satisfactory to make decisions.

2.1.2 Vindication of methods and framework:

This application will develop with simple design and standard architecture to focus on user friendly usability and data security. For better management of development system will be divided to small components and developed on iterative and incremental process. So far, development will strictly follow Dynamic System Development Method (DSDM) criteria.

DSDM Atern supports incremental and iterative development. Main focus of it on end user expectation and goal achievement. Change at time of development also be supported.

2.1.3 Aims and targets of the task:

The principle points and targets of this venture are to build up a cutting edge secure web application. It will be worked by means of on the web. With the goal that the administration can keep up the framework locally and remotely from wherever and clients can ready to utilize application from wherever. Another critical points of the venture is additionally planning, track of exchanges and projection

2.1.4 Project objectives:

These following destinations will be accessible in this undertaking.

- Developing a secure modern web application for personal finance management.
- Providing authentication services to secure log in and store data.
- Storing all user access data, transaction information in a proper way.
- Providing facility to view all information.
- Provide facility to add several account and card and real time synchronization through API.
- Providing budgeting facility.
- Providing personal financial goal management.

2.2 Background:

Most of the people interested to keep track of their personal finance which generally happens by keeping manual notes either on paper or memory. Proper tracking of their account and hand cash according to expense and income is most challenging and not enough accurate most of the time. People interested to maintain a timely manner budgeting to lead peaceful life and want to make better personal financial decision based on their current status and future projection.

Research and analysis of lot people's lifestyle and interest we found they are willing to use such a system or application to make their easier to manage their personal financial data management. Motivation of developing this application comes from helping people to make their life easier.

Integrating of Artificial Intelligence on this system will help to learn and provide suggestions to achieve better goals to user to improve their personal life in terms of personal finance.

2.3 Project Scope:

There are a great deal of things that can be canvassed in this project. However, inside this brief period numerous angles that are unrealistic to create. In this way, fundamental perspectives have been isolated. As far as possible are:

- Management and storing of user's data will cover.
- Transaction management will cover.
- Budget management will cover.
- Reporting through charts, graphs and tables will cover.
- Goal management will cover.

2.4 Resource:

Software tools: Software tools that will be used to develop this project:

- Programming language PHP for back-end business logic.
- PhpStrom as development tool.
- Docker as container system.
- MySQL version 5.7 will use for database.
- HTML, CSS, CSS framework bootstrap and JavaScript as designing tool
- Operating system will use Ubuntu Linux.

2.5 Human Resources:

It's a scholarly independent task so one individual is doled out to execute as an expert, a designer and an analyzer and apportioned days for this undertaking is 100 days in general.

2.6 Area of Problem:

People using manual method to keep tracking their expenses and income. Budgeting also follow several manual step on daily basis to keep track and trace current status. Maintaining accuracy is most challenging part of manual method. Their is not reporting and projection on manual method followed currently. Projection most time happens based on assumption which create further complexity to well maintain budgeting and personal financial goals.

Real time input of transnational information is near about impossible which create missing or forgettable data rather and directly impact budgeting and projections.

2.7 Possible solution:

After facing all of those problems, people are interested to use a computerized system to keep real time track of personal financial transaction and maintained accurate budgeting.

2.8 Nature of challenge:

At project development there are five task. By sequentially these are: analysis, design, coding, testing and implementation. Most challenging part is analysis and design as scope of collection requirement from end user is limited and as academic project one person will complete all task including development. So far he will act as analyst, designer, developer and tester of this project. Project will be develop under LAMP environment where PHP will use as backend language and MySQL will use as database. Also several frontend technology will use for UI. Learning and implementing all these technology will require time. So, time constrain is another challenge for this project.

2.9 Factors for basic achievement:

The variables that should be worried for basic achievement:

- Development of role based system to secure user access to information.
- Development of website for user dashboard.
- Providing necessary information on website for users.
- Development of user friendly navigation system for users.
- Development of a budgeting system for all users.
- Development of a goal management system for users.
- Maintaining all information of users such as transaction history, account information, budgeting information, goal information, category information.

Chapter 3: Literature's review

3.1 Discussion on issue area dependent on distributed articles

As indicated by Towanda Mitchell, monetary administration is dealing with our budgetary circumstance in a mindful way to accomplish budgetary autonomy (UMBC Money Matters Seminar, n.d). It manages overseeing cash in all everyday issues. Budgetary administration incorporates individual money related administration and association the board. Individual monetary administration causes us to deal with the back of our home which incorporates planning, sparing, contributing, obligation the executives and different angles identified with individual cash where by an individual can accomplish individual objectives (Bimal Bhatt, 2011). As it were, individual monetary administration is the way toward controlling pay and sorting out costs through a nitty gritty money related administration is the way toward controlling pay and arranging costs through an itemized budgetary arrangement. Figuring out how to monitor cash coming in, and fitting the utilization of this cash to fit costs gives a precise way and using pay (Joseph Wilner, 2009). Individual budgetary administration leads extremely individual to carry on with a superior life. The more effective we are with our funds, the better our lives will be either today or down in the line.

The proposed administration data framework requires the underneath things:

- Development of an web application with secure access method.
- Development of dashboard with reporting information.
- Development of charts and graph for transaction
- Development of charts and graph for money flow
- Development of charts and graph for budgets
- Development of goal management
- Development of assets and liability management

3.2 Discussion on issue arrangements dependent on distributed articles

There are a few different ways to take care of the above issue spaces. Building up the framework with legitimate advancement approach will make the framework proficient generally the proposed framework may be end as disappointment venture. A standout amongst other methodologies is creating framework from our center needs that can offer help our specific need. The accompanying methodologies are as per the following.

- System advancement ought to be inside time and quicker with the best quality. Bleeding edge advancements ought to be utilized for driving execution.
- Right technique ought to be decided for this sort of task that can quicker the advancement and bring the best arrangement.
- Verified organized methodology ought to be executed amid improvement for getting the correct component that can enliven the execution and fill client's requests.
- Developing and testing ought to be arbitrary, with the goal that any mistake amid improvement would be discovered and understood quickly. Furthermore, it won't influence the framework later.
- Building site that ought to coordinate with the framework. So basic data can be given to clients on web applications.

3.3 Comparison of two available applications

Comparison between “Personal Capital” and “Money Dashboard” personal finance management system:

3.3.1 Personal Capital:

Personal Capital’s primary function is to track users investments, assets and savings, rather that specifically looking after user's current accounts. Personal Capital offers specific advice and statistics based on your goals and current standings. but access to human financial advisors is where company makes its money.

Website Link: https://www.personalcapital.com

Figure 01: Personal Capital

Best features:

- Fees are lower to use.
- Cloud hosting application can use anywhere anytime.
- Good customer support.
- Details reporting.

Limitations:

- Not free to use
- Not suitable to use outside of US.
- Need real time account synchronization.

3.3.2 Money Dashboard

Money Dashboard will track spending, offering an overall pie chart depicting your spending on loads, consumables, transport and the like. There's an at-a-glance overall balance, showing exactly how much money user have available across all of your accounts, and user can compare this to the previous month's figure to show how well user been managing their funds.

Website Link: https://www.moneydashboard.com

Figure 02: Money Dashboard.

Best features:

- Free to use.
- Interactive UI.
- Support of planner.
- Have version support for all platform.
- Provide different types of graph information.

Limitations:

- Not suitable for use of country like ours where real time synch with account is a bit risky and not ideal.

3.4 Recommended methodology

To design an effective personal finance management system the best way is to identifying the local scope and how deeply the manual operation and flow working and keep in mind what the user wants. So all of these things will help to design and develop an organized personal finance management system. Here are some recommended best ways:

- Integrating the dashboard for client to get all data on a solitary place.
- Storing data in sorted area, for example, class, labels and so on.
- Ensuring protection and framework security.
- Implementing approval for each conceivable ways.
- System UI ought to be intuitive and straightforward.
- Navigation must be simple and legitimate put.
- Gathering client's feeling to comprehend what they need.
- Providing normal data on site.
- System advancement ought to be solid as indicated by examination and establishment.

CHAPTER 4: METHODOLOGY

4.1 What to use:

Creating application and run or increment business dependent on that application is a typical pattern at present. Be that as it may, it is such a great amount of extreme to adapt up as indicated by end client's needs. Since accomplishing end client's needs speaks to the achievement rate of an application. That is the reason diverse sorts of systems have been acquainted throughout the year with increment task's prosperity rate.

Procedure is utilized for this individual fund the board framework improvement as a system for arranging, organizing and controlling the advancement procedure. There are distinctive sorts of philosophies are accessible for advancement, for example, lithe programming improvement philosophy, dynamic frameworks advancement show technique, outrageous programming strategy, joint application advancement system, lean advancement procedure, scrum approach and so on.

DSDM Atern has been decided for this venture improvement. Since, it is client related and gives valuable methods and rationalities to accomplishing client's objective.

4.2 Why to use:

DSDM Atern is reasonable for any sort of activities however best for group venture. As an independent venture there may be couple of degrees where DSDM Atern won't be appropriate. In any case, in view of Atern theory and unmistakably characterized standards it is best philosophy to build up this task. Atern characterizes that any task must be: (DSDM Consortium, 2010)

- Aligned to plainly characterized vital objectives
- Developed cooperatively.
- Focused on early conveyance of genuine advantages to the business.

4.3 Factors why DSDM Atern is material for this undertaking

- The important objective of DSDM Atern is to convey items as per business needs in the correct time.
- DSDM Atern considers setting up specific targets and creates and conveys it.
- DSDM Atern permits cooperative advancement inside engineer and the end client.
- Atern never bargain with items quality.

- Atern permits improvement from establishment and expanding advancement one by one.
- Atern permits iterative improvement with the goal that any progressions amid advancement can be overseen.
- Atern permits nonstop correspondence among designer and end client.
- Atern permits showing authority over the entire task for overseeing danger and change the executives. (DSDM Consortium, 2010)

Other than theories and systems there are likewise couple of more explanations behind picking this technique. Atern gives a few different ways which makes the framework solid, powerful and client situated. These ways are MoSCoW prioritization, encouraged workshop, time boxing and so forth.

- **MoSCoW prioritization**

MoSCoW prioritization is utilized to organize the prerequisites in need arrange which are gathered from end client. It causes engineer to acknowledge which prerequisites are important to convey at first. The elaboration of MoSCoW terms are as per the following -

- **Must have:** The major necessities of a framework are called must have prerequisites. Without these necessities the task won't be conveyed as a venture or the framework will be considered as pointless.
- **Should have:** Requirements that are imperative however without these necessities the framework will be helpful and usable. Ought to have prerequisites are critical however not verifiably basic.
- **Could have:** Requirements that are imperative however simple to skip. These sorts of necessity is utilized to build business advantage and for framework's effectiveness. It is extremely frustrating to skirt these necessities yet it makes no issue the framework.
- **Won't have this time:** These are as yet important prerequisites yet it can hold up until further improvement or might be later.

- **Facilitated workshop:**

Encouraged workshop characterizes joint prerequisites arranging. For the most part it is somewhat discourse between framework designer and framework proprietor or end client. Through encouraged workshop, end client or association staffs are urged to audit the framework that is being created and discover their issues and arrangements and rundown out their present issues and talk about with framework designer. From along these lines, a necessity list has been created and after that it is organized by applying MoSCoW rules.

- **Iterative development:**

It is a key system where abnormal state necessities are set up in the establishment stage to be investigated and change more subtleties amid improvement in the period of investigation and building. To develop the key methods are from an abnormal state thought, to a conveyed item and gradually. Iterative improvement cycles are short and comprise of a few stages. These are as per the following –

  - Identifying targets for the proposed framework
  - Planning to meet those targets.
  - Evolving any targets amid advancement.
  - Testing the answer for check objective has been accomplished.

- **Modeling and prototyping:**

It is connected idea. A model is dependably a sort of model however a model might be or might be not a model. A model is a lot of graphs, for example, bound together demonstrating dialect (UML). Subsequent to finishing a model then prototyping is begun in the improvement stage. Demonstrating sees how to build up a necessity. Atern permits this system for guaranteeing that the end client's necessities and the created highlights stay same.

- **Time-boxing:**

Time boxing is the achievements of the entire venture or specific goal. DSDM Atern permits diverse sorts of time box. For example, a period box can be for entire undertaking, a period box can be for each errand or each component; a period box can be for each stage. Atern permits time boxing for conveying the item inside time. (DSDM Consortium, 2010)

4.4 Sections of methodology:

DSDM Atern has a configurable lifecycle. It is intended for business advantage which permits conveying items every now and again, iterative and gradual advancement, and persistent business association, testing and giving business benefits. It has a few stages.

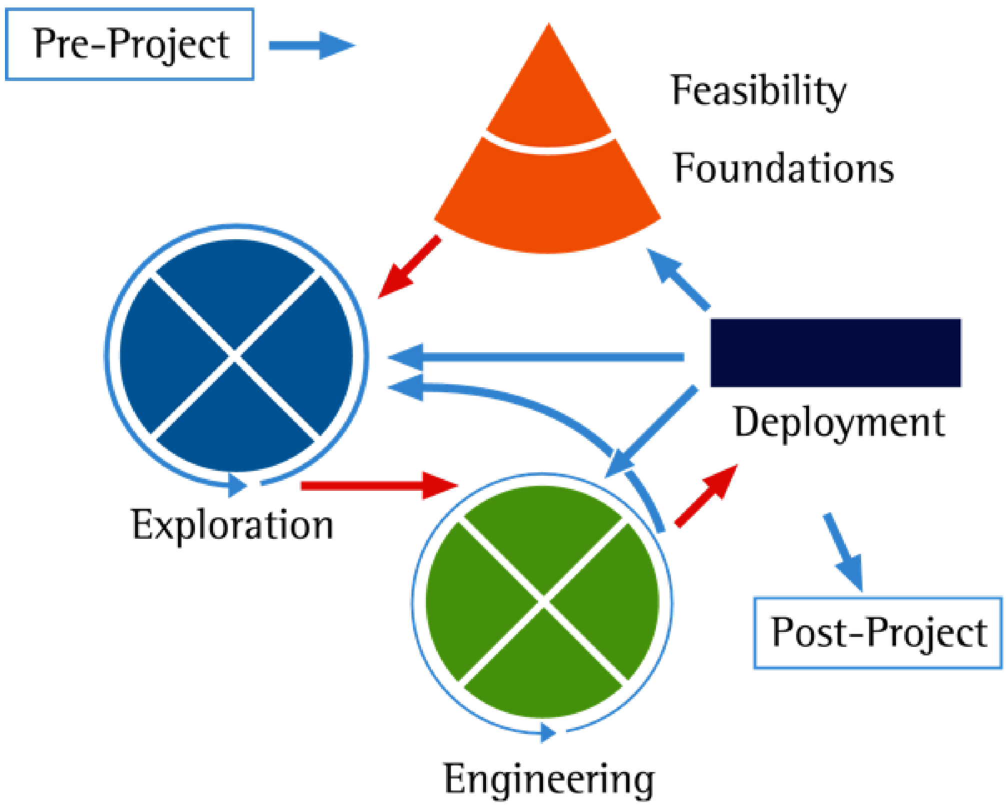

Figure 03: Sections of methodology

- **Pre-project**

In this stage, venture proposition is readied and undertakings targets are set up and in addition business issue are tended to.

- **Feasibility**

In this stage it is depicted whether there is a practical answer for business issues and expected advantages are distinguished and illuminated methodologies for venture conveyance.

- **Foundation**

In establishment stage, doable task are expounded transparently including its answer design, physical or infrastructural components and specialized usage measures. Business viewpoints are engaged and examined how quality will be guaranteed.

- **Exploration**

In investigation stage, an appropriate examination is happened dependent on business and specialized points of view. All necessities are recognized and organized. This stage bears an incredible obligation regarding effectiveness of a venture

- **Engineering**

In building stage, steady and iterative advancement is occurred for accomplishing venture objectives. It is important to meet acknowledgment criteria. Testing is a piece of this stage

- **Deployment**

In sending stage, the total arrangement is given to association and moved into live to utilize. A key audit of the task is likewise given in this stage.

- **Post-project**

In this stage, the venture execution is observed and estimated regarding business needs. This stage characterizes whether the business benefits have been obtained or not from the undertaking. (DSDM Consortium, 2010)

CHAPTER 5: PLANNING

5.1 Project Plan

Project arranging characterizes how to finish an undertaking inside specific accessible assets, time span and assigned spending plan. Undertaking arranging is the key stages for finishing this venture effectively. Here, this entire undertaking has been partitioned into a few stages, for example, work breakdown structure, assets distribution, action arrange and so on. These are characterized underneath

5.1.1 Work Breakdown Structure (WBS):

Work breakdown structure for this personal finance management system:

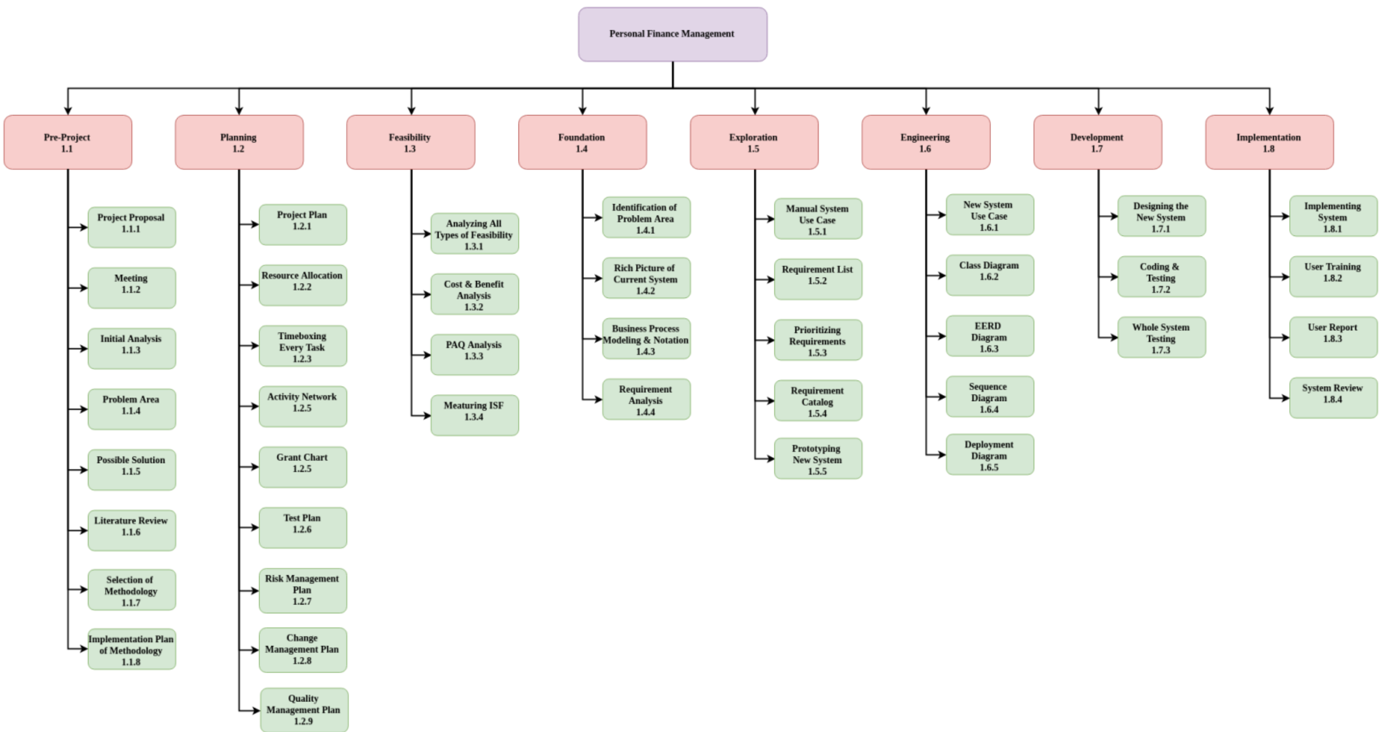

Figure 04: Work breakdown structure

5.1.2 Activity Network Diagram:

Activity	Pre-Condition	Duration (Day)
Pre-Project	-	10
Planning	Pre-Project	20

Feasibility	Pre-Project	6
Foundation	Pre-Project	10
Exploration	Foundation	10
Engineering	Exploration	15
Development	Planning, Exploration	30
Implementation	Development	15

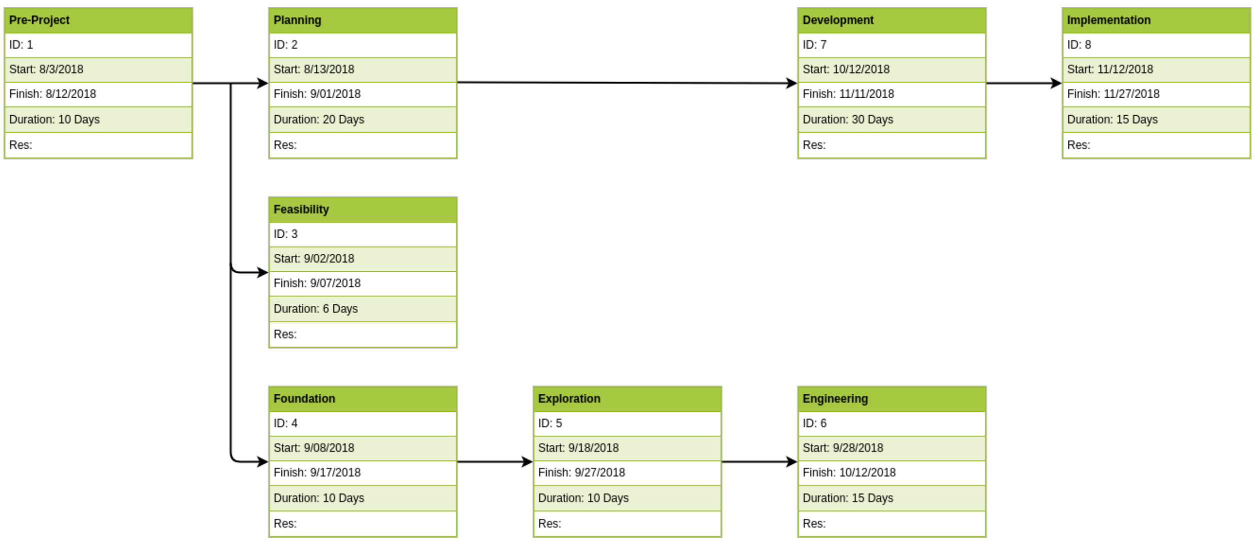

Figure 05: Activity Network Diagram

5.1.3 Gantt chart

Project Gantt chart:

TASK NAME	START DATE	END DATE	START ON DAY*	DURATION* (WORK DAYS)	PERCENT COMPLETE
Personal Finance Management					
1.1.2 Meeting	5/3	8/12	0	102	10%
1.1.5 Possible Solution	8/13	8/20	102	8	12%
1.1.8 Report	8/21	8/30	110	10	13%
1.2.2 Resource Allocation	9/1	9/6	121	6	20%
1.2.5 Grannt Chart	9/7	9/14	127	8	25%
1.2.8 Change management plan	9/15	9/19	135	5	30%
1.3 Feasibility	9/20	10/5	140	16	37%
1.4 Foundation	9/25	9/28	145	4	40%
1.4.3 Process modeling	9/27	9/29	147	3	50%
1.5 Exploration	9/30	10/25	150	26	55%
1.5.3 Recquirement catalogue	10/5	10/13	155	9	60%
1.5.6 Report	10/14	10/30	164	17	65%
1.6.2 Class Diagram	10/17	10/19	167	3	70%
1.6.6 Deployment Diagram	10/20	11/19	170	31	75%
1.7 Development	11/20	11/24	201	5	80%
1.7.3 System testing	11/25	11/29	206	5	85%
1.8 Implementation	11/30	12/4	211	5	90%
1.8.3 User Report	12/5	12/10	216	6	100%

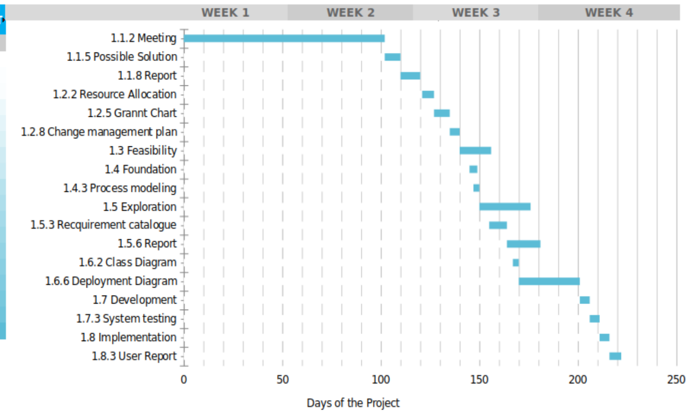

Figure 06: Project Gantt chart

5.2 Test Plan

Test plan is a fundamental stage for giving a quality full item. In a test plan the extension, procedures and criteria are depicted for testing specific expectations of a venture. Along these lines, here various test designs have been portrayed for testing this individual back administration framework.

5.2.1 Testing against time boxes:

Test plan against time boxes is an essential part to pick up undertaking's advancement inside distributed time. In this way, a test plan has been created against the characterized time box. With the assistance of this arrangement this entire venture will be appropriately checked and watched and is anything but difficult to quantify advance.

5.2.2 Required tests

- **Unit Testing:** Unit testing will be performed for testing explicit usefulness or every module of this individual fund the executive's framework.
- **Integration Testing:** Integration testing will be performed by consolidating all modules or parts of this framework and testing it as a gathering to guarantee that this framework is working legitimately.
- **Acceptance Testing:** Acceptance testing will be performed for confirming that this framework has met all client prerequisites and the framework is prepared to convey.

- **Performance Testing:** Performance testing will be performed to gauge this current framework's effectiveness. Execution testing will distinguish this present framework's reaction against client's desire.
- **Security Testing:** Security testing will be performed to check whether the framework is secure or not. Security testing will gauge this current framework's weakness and capacity to anchor the classified information.

5.2.3 Testing Environment:

Necessary tools required for proper testing states below:

- Full configured PC with Ubuntu Linux.
- Web browsers such Mozilla, Google chrome etc.
- Internet connection
- Some valid data.

5.3 Risk Management:

Risk management is one of the significant key stages in task the executives. It is a procedure of recognizing, dissecting and reacting amid the existence cycle of an undertaking. The best enthusiasm of hazard the executives lies in venture's destinations. Hazard the board isn't intended for hazard distinguishing proof yet in addition to measure and legitimize the dangers which are satisfactory and unsatisfactory that accounted by higher administration. It is ceaseless process. Effective hazard the executives isn't just decrease the likelihood of an occasion or hazard happening yet additionally considered as routine with regards to great administration. Appropriate hazard the board has a few stages that need to pursue.

5.3.1 Identification of Risk)

Identification of risk is the principle procedure for hazard the board. So the fundamental point of view of hazard recognizable proof is to distinguish chance from conceivable each part of this framework. For this individual back administration framework certain sources are distinguished that can cause potential dangers. These sources are:

- Technical
- Client
- Schedule
- Environmental
- People
- Weather

So those are the conceivable hotspots for this framework for any potential hazard. Here is the rundown of conceivable dangers for this administration framework that can be made from those sources.

- Insufficient resources available to complete the project.
- Overly optimistic schedule.
- Poorly defined requirements.
- Project scope is ill defined.
- Inadequate design of application
- Poor software quality
- Architecture of this system lacks flexibility (Mar, 2013)

For this individual fund the executives framework a layout has been intended for recognizing and keeping up this procedure.

5.3.2 Assessment of Risk

Hazard appraisal process has come after hazard ID process. All dangers that are distinguished are to be estimated by potential misfortune related with the hazard. All dangers are not same, for example, a few dangers are bound to occur and a few dangers cause more misfortune than others.

So for proper risk assessment some steps will be followed for this personal finance management system:

- Identifying the losses for potential risk.
- Evaluating the likelihood of a risk occurring and its strictness.
- Considering a simple operational condition as well as shutdowns, power outages, emergencies etc.
- Analyzing all available safe information about the losses that the risks cause.
- Identifying necessary action to control the risk.
- Monitoring that the risk is controlled.
- Documenting the whole process in case it is necessary how the risks are assessed.

5.3.4 Evaluation of Risk:

Assessing dangers implies organizing the potential dangers dependent on risk it causes against this current framework's resistance level.

- Differentiating the hazard level against this present framework's resistance level.
- Prioritizing the dangers that are bound to occur and causes more misfortunes.
- Ranking the organized dangers list for the board.

For this individual fund the board framework a format has been intended for keep up hazard evaluation.

5.3.5 Control of Risk:

After risk identification and assessment then it comes to risk control. Risk control means what are the precautions when risks occur. To develop this management system here are some ways that need to be concerned to control the above risks.

- **Insufficient resources available:** Exploring various and numerous ways for secure resource and also considering alternative implementation plan and rescheduling and re-prioritizing tasks.

- **Poorly defined requirements:** Developing clear, complete, consistent, acceptable requirement that are agreed by the stack holder.
- **Poor design of application:** Insisting on agreed requirements proceeding for initiating design. And also following design standards and allowing sufficient time for designing will be helpful.
- **Poor quality:** Taking feedback from stack holder and user to validate requirements and design specification help to reduce risk.

For this personal finance management system, it needs to keep in mind that cost and benefit to users and other consequences have to be reasonable for controlling the risk.

CHAPTER 6: FEASIBILITY

Feasibility study characterizes that an examination on the current framework for the proposed framework to decide is it attainable to build up the framework from specialized, moral, asset and operational factors inside distributed spending plan and time. In this way, all these possibility factors are imperative to build up this individual fund the executives framework. These all achievability factors are depicted underneath:

6.1 Type of feasibility

- **Technical feasibility:** Technical possibility: Technical practicality concentrated on specialized assets that are accessible in this close to home fund the executives specialized group can change over the thought into a working framework. It likewise assesses all the equipment and programming expected to build up this proposed framework.
- **Economic feasibility:** Economic practicality concentrated on ascertains the reasonability and cost and advantages of the proposed individual fund the board framework. It additionally assesses this current club's certain financial advantages from the proposed administration framework.
- **Legally feasibility:** Legal practicality centers will the proposed administration framework struggle with any legitimate necessities, for example, information security act, social law and so on.
- **Operational feasibility:** Operational attainability concentrates how this present club's business prerequisites will be satisfied by utilizing this proposed administration framework. By and large it is a measure that how well this proposed administration framework will take care of this current club's issues and exploit the open doors that are distinguished in the degree definition. For guaranteeing achievement some operational results, for example, unwavering quality, practicality, bolster capacity, ease of use, maintainability and so on must be told amid structure and advancement.
- **Scheduling feasibility:** It is critical to pick up undertaking's prosperity. It decides how much time should finish this administration framework dependent on this present club's specialized asset and expertise. Now and again a few techniques can be utilized to appraise the period to finish the venture.

6.2 Cost Benefit Analysis

The fundamental motivation behind money saving advantage examination is to assess the cash an incentive with the business advantages of this proposed administration data framework. Here is the money saving advantage examination of this individual fund the executive's framework:

Proposed system cost for stakeholder:

Name	Number	Cost (BDT)
Domain Registration Cost		1000 (Yearly)
Hosting Cost		4000 (Yearly)
Staff	2	30,000 (Monthly)
Maintenance Cost		12000 (Yearly)
Internet Bill		1,000 (Monthly)
Total Cost	389,000 BDT per year	

User Cost Analysis:

Name	Number	Cost (BDT)
Notebook	12	2400 (Yearly)
Blank Paper		2000 (Yearly)
Pen and stationary		2000 (Yearly)
Total Cost	6400 BDT per year	

Proposed system use cost for user:

Name	Number	Cost (BDT)
User License	12	600 (Yearly)
Total Cost	600 BDT per year	

Next five years cost & saving analysis:

Year	Existing System Cost (BDT)	Proposed System Cost (BDT)	Savings (BDT)
2016	6400	600	5800

2017	6400	600	5800
2018	6400	600	5800
2019	6400	600	5800
2020	6400	600	5800

According to cost benefit analysis, it can be said that if though initial cost is high to setup configuration and development of this personal finance management system but end user will be benefited by using this system with a little yearly fee.

6.3 DSDM –Project Approach Questionnaires

By and large task approach polls' depend on DSDM Atern instrumental achievement factors. It recognizes and guarantee the dimension of accomplishment everything being equal and address the potential hazard regions. It is considered as a decent practice in venture the board. Here is the PAQ examination amid the improvement of this individual fund the executives framework.

From the above progress rate, it is demonstrated that DSDM Atern is useful for this undertaking and actualizing Atern will bring accomplishment for this venture.

CHAPTER 7: FOUNDATION

7.1 Identification of Problem Area

Recognizing issue is the most vital thing to assemble another framework. Along these lines, to construct this individual fund the board framework, there are a few methods that have connected to recognize the issue region such talking a few kind of clients, perception, surveys and so forth. Here are the subtleties of these methods.

7.1.1 Interview

Meeting is one of the customary and ideal methods for social event information about this individual fund the board and distinguishing issue territories. A few meetings have been performed on the few sort of client, for example, corporate individual, work holder, agent. Here are the subtleties of those meetings.

7.1.1.1 Rashedur Rahman Roni (Managing Director of Bornomala IT)

Mr Rashedur Rahman Roni acting as managing director of Bornomala IT. We asking several type of question regarding personal finance management of his corporate life. His summaries answer of our question states as below:

“I am Rashedur Rahman Roni (MD of Bornomala IT). I would like keep organize everything in my professional and personal life. Finance management is crucial part for both corporate and personal life. At corporate life some tools already in market which may help us to keep track of organization financial transactional data whether at personal finance management sector there is no special solution yet available by targeting geographical area like our country where special type of requirement should be implement. I think proper budgeting, and goal management is a big deal to keep growth steady on personal financial life. I think personal financial stability help you to concentrate more on your corporate professional growth.”

7.1.1.2 Akidul Islam (General Employee)

I am Akidul Islam employee of a renowned ready made garments industry. As a fixed monty earner I would like to keep balance between my income and expense. For keeping track on my financial transaction is most important. Trace of my monthly budget is help me to tweet my expense based on my financial status. But most challenging fact I am facing is not manually booking is tough at regular life. I expect a solution to keep track and trace base on my transaction. Current status should be projected to help user to know their regular financial status.

7.1.1.3 Tajul Islam (General Person)

Hello sir, my name is Tajul Islam. I am a general shop keeper. I face issues everyday to keep track of my financial transaction. My family expense goes from my shop income at everyday need basis. So far sometimes I get lost to retrieve my total personal life expense which create issue of budget fail or unable to pay product bill on time. If there will a solution or application which I can use to track my financial transaction based on category it will help me a lot to me more organized on my personal life. I can find out the growth of my financial status including my shop and my personal life. Budget over expense should provide alert though I can know I am going to over expense.

7.1.1.4 Nasir Uddin (Independent Professional)

I am a dental doctor. I have several chamber which is source of my income. Most of the time I feel stress to keep track of income from all chamber and balancing cost is most difficult task. I am in need a solution whether I can keep track of income and expense of every individual chamber. It will help me justify status of chamber net earning. Personal finance management application can be a solution for me. Mostly I suggest categories transaction input should be there. So far user like me can create multi level category to manage income and expense based on individual chamber. Beside these some common expense will work in my case such as require medicine and chemical related with treatment. Tag should be at application. So, I can add tag on transaction to keep track not only based on category but also based on tag.

7.1.3 Observation

Perception is likewise another information gathering strategy. It implies watching the current manual strategy step by step work and screen with existing watching individual. Along these lines, a few perceptions likewise performed on manual individual back administration for a few kind of client from low salary to high pay including multi pay source individual at their day by day life. It sees how individual to individual dealing with their back physically. Because of perception it tends to be said that this manual and paper based arrangement of a lot of upsetting and mis prompting give right projection and it causes undeniably a greater number of disservices as opposed to favorable circumstances.

7.1.4 Questionnaires

Questionnaires is likewise another information gathering strategy. It implies watching the current manual strategy step by step work and screen with existing watching individual. Along these lines, a few perceptions likewise performed on manual individual back administration for a few kind of client from low salary to high pay including multi pay source individual at their day by day life. It sees how individual to individual dealing with their back physically. Because of perception it tends to be said that this manual and paper based arrangement of a lot of upsetting and miss-prompting give right projection and it causes undeniably a greater number of disservices as opposed to favorable circumstances

7.2 Rich Picture:

Rich picture of the current manual process of this personal finance management:

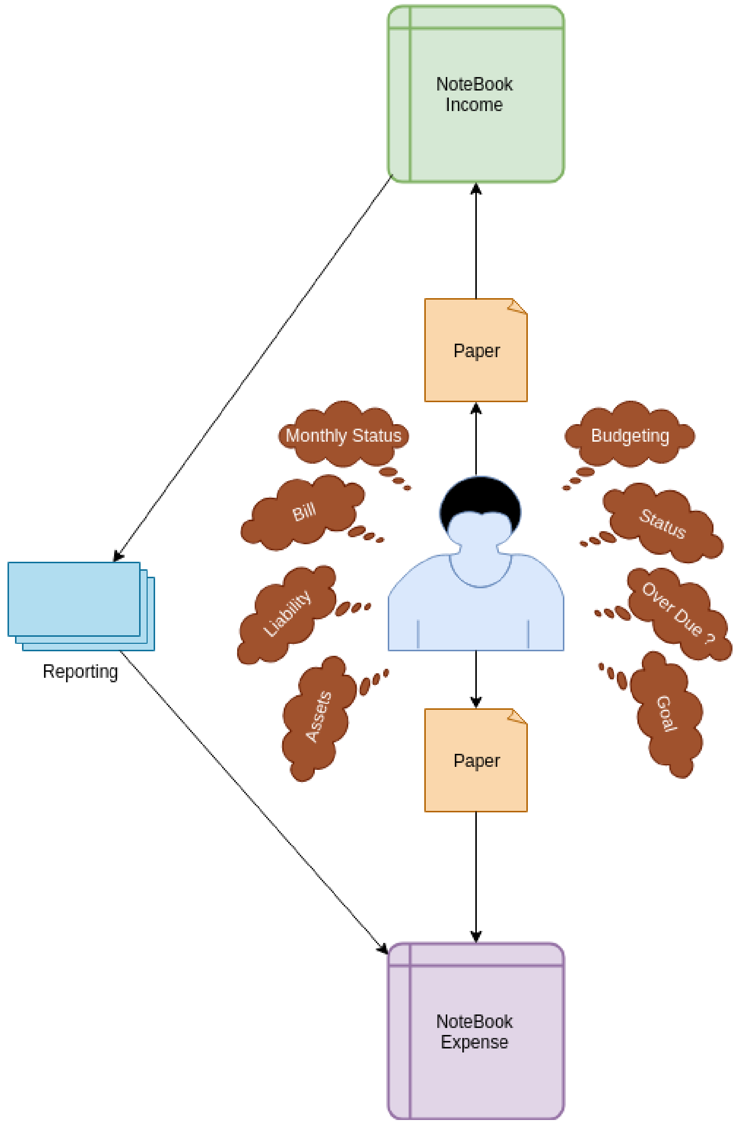

Figure 07: Current manual process rich picture

7.3 Specific problem area identification and description

Due to data loss problem and management problem users want implementation of a new computerized system to overcome their problem. For that at first it needs to identify what are the problems. After applying all the above data gathering techniques several problems have been identified. The details are below.

- Currently this all type of user is maintaining a paper based manual procedure to personal finance system. Most of the time required transaction information noted on piece of paper. So there is much possibility of data loss and data misuse which is also happened at current manual processing of data.
- Tracking of transaction information can not be managed day to day on categories.
- Tracing of budge is tough to check at instance. Require lot of manual effort.
- Wasting time to calculate summaries transactional data to get overview.
- Calculated status/overview/projection is not 100% correct always. Possibility to provide incorrect data.
- Can not handle several account based transaction.
- Can not manage financial goal.
- Can not track assets and liabilities.
- Not able to get alert for recurring transaction such as utility bill payment, house rent etc.

7.4 Possible Solution

In view of above exchange and issue articulations, it very well may be said that these client needs an answer which will defeat each one of those issues. The conceivable arrangements in view of keeping about information security and accuracy for those issues are portrayed underneath.

- An individual user authentication based web application where user will able to add account, can manage category, can add tags, can manage budgeting, can manage goal and can manage their assets and liabilities.

7.5 Requirement List

Based on the above discussion, interviews, observation and questionaries' several requirements have been identified. These requirements are found out based on current problems of manual personal finance management process. It is not prioritized requirement list yet. Here are the listed requirements.

- An web application with individual user authentication system.
- Storing transactional information based on category, account, tags and type.
- Providing facility to create/update/delete of account/category/tags
- Provide facility to create multilevel category.
- Provide facility to create/update/delete financial goal.
- Provide facility to add user assets and liability.
- Provide facility to create budgeting based on time range.
- Providing facility to get status through graph or table.
- Providing data security for all sensitive information.

CHAPTER 8: EXPLORATION

8.1 Use Case of manual process

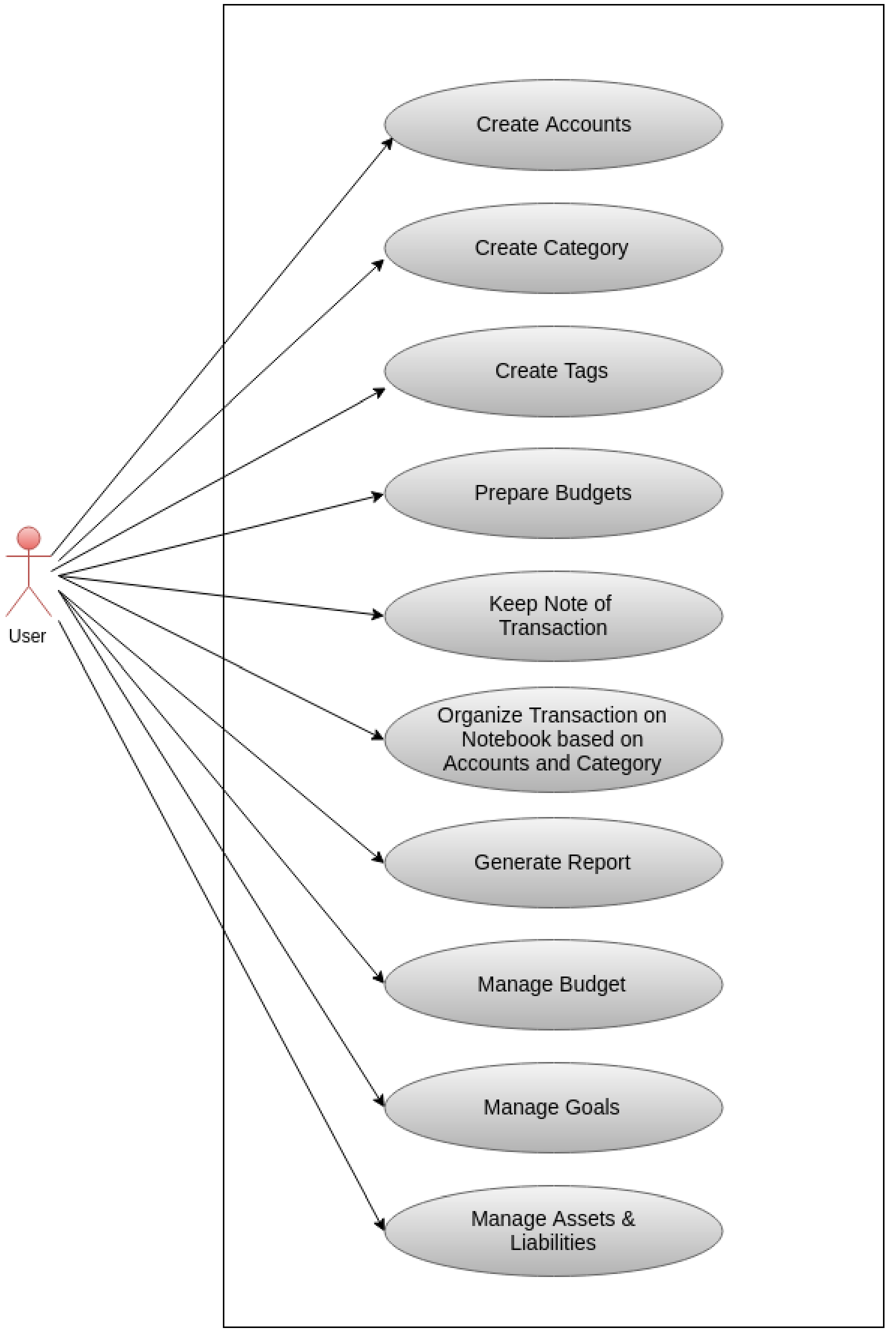

Figure 08: Manual process user case diagram

8.2 Complete Requirement List:

The overall full requirement lists for the proposed personal finance management system are as follows:

Full Requirement List	
RQ01	Store User Authentication Details
RQ02	Store User Information
RQ03	Store Accounts Information
RQ04	Store Category Information
RQ05	Store Tag Information
RQ06	Store Transaction Type
RQ07	Store Budget Information
RQ08	Store Goal Information
RQ09	Store Assets Information
RQ010	Store Liabilities Information
RQ011	Store Transaction Information
RQ012	View User Profile
RQ013	View Accounts Information
RQ014	View Category Information
RQ015	View Tags Information
RQ016	View Budget Information
RQ017	View Transaction Information Based on Date Range
RQ018	View Goals Information
RQ019	View Assets Information
RQ020	View Liabilities Information
RQ021	View Budget Status Graph

RQ022	View Transaction Graph
RQ023	View Income Vs Expense Graph
RQ024	View Categories Income/Expense Graph
RQ025	View Tagged Transaction Information

8.3 Prioritized Requirement List:

Based on MoSCoW prioritization prioritized requirement lists provided below:

Prioritized Requirement List	
Must Have	
MR01	Sign in
MR02	Store Account Information
MR03	Manage Account Information
MR04	Store Category Information
MR05	Manage Category Information
MR06	Store Budget Information
MR07	Manage Budget Information
MR08	Store Goal Information
MR09	Manage Goal Information
MR010	Prepare Budget Report
MR011	Prepare Transaction Report
MR012	Manage Recurring Transactions
MR013	Manage User Information
Should Have	
SR01	Graph Report Based on Category

SR02	Graph Report Based on Budget Category
SR03	Tabular Report of Transaction
SR04	Balance Transfer Between Accounts
SR05	Export Transaction Information
SR06	User Guide To Learn How To Use Application
SR07	Alert System For Over Expense of Budget Category
SR08	Notification For Recurring Transaction
Could Have	
CR01	Direct Account Sync with Bank and Card
CR02	AI feature to suggest how to save
CR03	Bill Payment
CR04	Virtual Wallet

8.4 Requirement Catalog

Based on prioritized requirement lists requirement catalog provided below:

Source: User	**Sign off:** User	**Priority:** Must	**Id:** MR01
Functional Requirement: Sign in			
Non-Functional Requirement:			
Feasibility: High			
Description: Accessing the system through authorized user.			
Goal: Project goal is to secure the system.			
Value of Target:		**Acceptable Range:**	

Source: User	**Sign off:** User	**Priority:** Must	**Id:** MR02
Functional Requirement: Store account information			
Non-Functional Requirement:			
Feasibility: High			
Description: Store several user account information.			
Goal: Project goal is to track transaction based on accounts.			
Value of Target: 50 (Per day)		**Acceptable Range:** Maximum 50 (Per day)	

Source: Staff	**Sign off:** Staff	**Priority:** Must	**Id:** MR03
Functional Requirement: Manage account information			
Non-Functional Requirement:			
Feasibility: High			
Description: Details account information will be managed through system database.			
Goal: Project goal is to update, and delete if needed account information.			
Value of Target:		**Acceptable Range:**	

CHAPTER 9 : ENGINEERING

9.1 New System Modules:

All module and sub module of personal finance management provided below:

- ➢ User information
  - Store user information
  - View, update and delete user information
- ➢ Accounts information
  - Store account information
  - View, update, search and delete account information
- ➢ Category information
  - Store category information
  - View, update, search and delete category information
- ➢ Tag Information
  - Store tag information
  - View, update, search and delete tag information
- ➢ Budget information
  - Store or tag budget category
  - Store budget information for every category
  - View, update, search and delete budget category and information
- ➢ Goal information
  - Store Goal information
  - View, update, search and delete goal information
  - Store goal contribution.
  - View Goals Status.
- ➢ Assets information
  - Store assets information
  - Manage assets information
  - View assets information.
- ➢ Liabilities
  - Store liabilities information
  - View, update, search and delete liabilities information
- ➢ Report
  - View several type of graph report of transactions
  - View Income Vs Expense Report
  - View Budget Report
  - View Saving Projection Report

9.2 Use Case Diagram of Proposed System:

Proposed personal finance management's use case diagram states below:

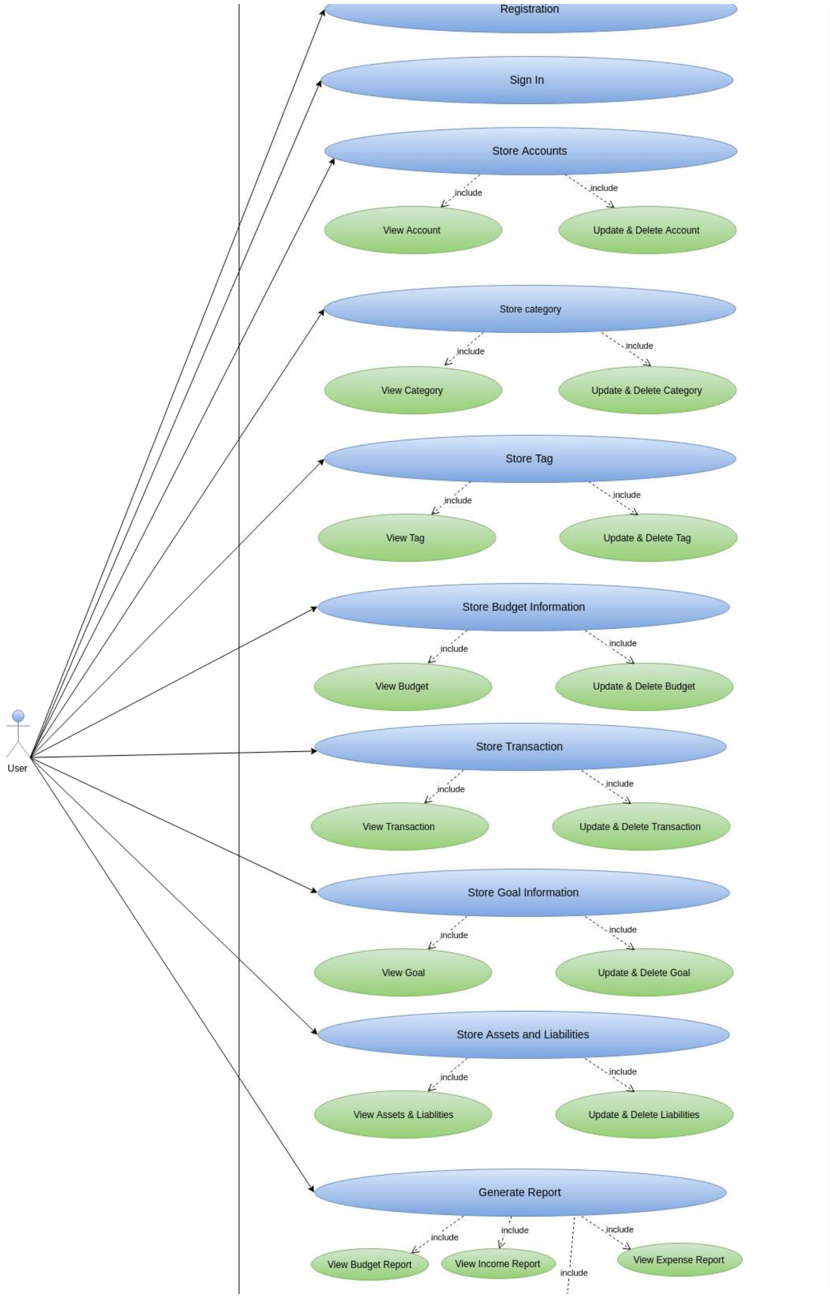

Figure 9: Use case diagram

9.3 Description of Use Case:

ID	**UC01**	**Prepared By**	Md Khorshed Alam
Name	**Registration**		
Actor	User		
Description	• Need for registration to accessing the system		
Include	None		
Pre-condition	• User should have internet access		
Post-condition	• User will get access token to access system		
Flow	• User will complete registration form and submit • User will get verification email along with verification link • User will verify account using that link		

ID	**UC02**	**Prepared By**	Md Khorshed Alam
Name	**Sign In**		
Actor	User		
Description	• Need for accessing the system		
Included	None		
Pre-Condition	• User have an account • This account is set through registration		
Post Condition	• User will get total access of the system		
Flow	• User requests and provides valid username and password to access the system • System permits user request and provides access to the system • Deny and show message for invalid username or password.		

ID	**UC03**	**Prepared By**	Md Khorshed Alam
Name	**Store Account Information**		
Actor	User		
Description	• It is an important functionality for managing account information		
Included	• View account information • Search, update and delete account information		
Pre-Condition	• User need to sign in to the system		
Post Condition	• User access the system • Account information stored in system database.		
Flow	• User view account information page • Provide necessary information • Show message for any invalid information • Information stored in database		

ID	**UC04**	**Prepared By**	Md Khorshed Alam
Name	**Store Category Information**		
Actor	User		
Description	• It is an important functionality for managing category information		
Included	• View category information • Search, update and delete category information		
Pre-Condition	• User need to sign in to the system		
Post Condition	• User access the system • Category information stored in system database.		
Flow	• User view category information page • Provide necessary information • Show message for any invalid information • Information stored in database		

ID	UC05	Prepared By	Md Khorshed Alam
Name	**Store Tag Information**		
Actor	User		
Description	• It is an important functionality for managing tag information		
Include	• View tag information • Search, update and delete tag information		
Pre-Condition	• user need to sign in to the system		
Post Condition	• User access the system • Tag information stored in system database.		
Flow	• User view tag information page • Provide necessary information • Show message for any invalid information • Information stored in database		

ID	UC06	Prepared By	Md Khorshed Alam
Name	**Store Budget Information**		
Actor	User		
Description	• It is an important functionality for managing budget information		
Included	• View budget information • Create budget information • Search, update and delete budget information		
Pre-Condition	• User need to sign in to the system		
Post Condition	• User access the system • Budget information stored in system database.		
Flow	• User view budget create information page • Provide necessary information • Show message for any invalid information • Information stored in database		

ID	UC07	Prepared By	Md Khorshed Alam
Name	**Store Transaction Information**		
Actor	User		
Description	● It is an important functionality for managing transaction information		
Included	● View transaction information ● Create transaction information ● Search, update and delete budget information		
Pre-Condition	● User need to sign in to the system		
Post Condition	● User access the system ● Transaction information stored in system database.		
Flow	● User view transaction create information page ● Provide necessary information ● Show message for any invalid information ● Information stored in database		

ID	UC08	Prepared By	Md Khorshed Alam
Use Case Name	**Store Goal Information**		
Actor	User		
Description	● It is an important functionality for managing goal information		
Included	● View goal information ● Create goal information ● Search, update and delete goal information		
Pre-Condition	● User need to sign in to the system		
Post Condition	● User access the system ● Goal information stored in system database.		
Flow	● User view transaction create information page ● Provide necessary information ● Show message for any invalid information ● Information stored in database		

ID	**UC09**	**Prepared By**	Md Khorshed Alam
Name	**Store Assets and Liabilities Information**		
Actor	User		
Description	• It is an important functionality for managing assets and liabilities information		
Included	• View assets and liabilities information • Create assets and liabilities information • Search, update and delete assets & liabilities information		
Pre-Condition	• User need to sign in to the system		
Post Condition	• User access the system • Assets & liabilities information stored in system database.		
Flow	• User view assets and liabilities information page • Provide necessary information • Show message for any invalid information • Information stored in database		

ID	**UC010**	**Prepared By**	Md Khorshed Alam
Name	**Generate Report**		
Actor	User		
Description	• It is an important functionality for several type of reports		
Included	• View Budget Report • View Income Report • View Expense Report • View Income Vs Expense Report		
Pre-Condition	• User need to sign in to the system		
Post Condition	• User access the system • Require information retrieve from system database.		
Flow	• User view report page • User select report type • User select date range • User view report in graph format or tabular format		

9.4 Class Diagram

Class diagram of the personal finance management system:

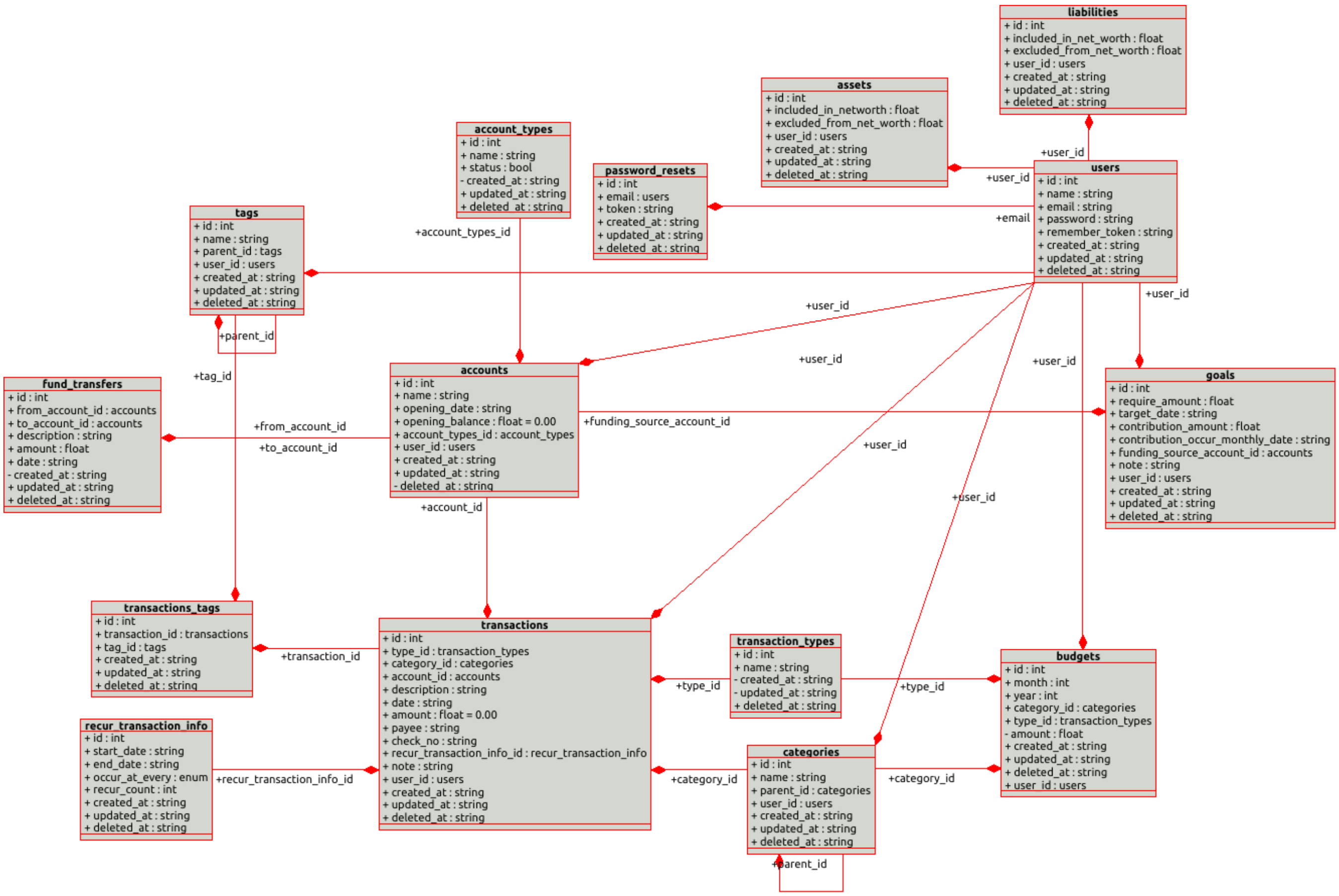

Figure 10: Class diagram of personal finance management system

9.5 ERD Diagram

Entity relationship diagram of personal finance management system:

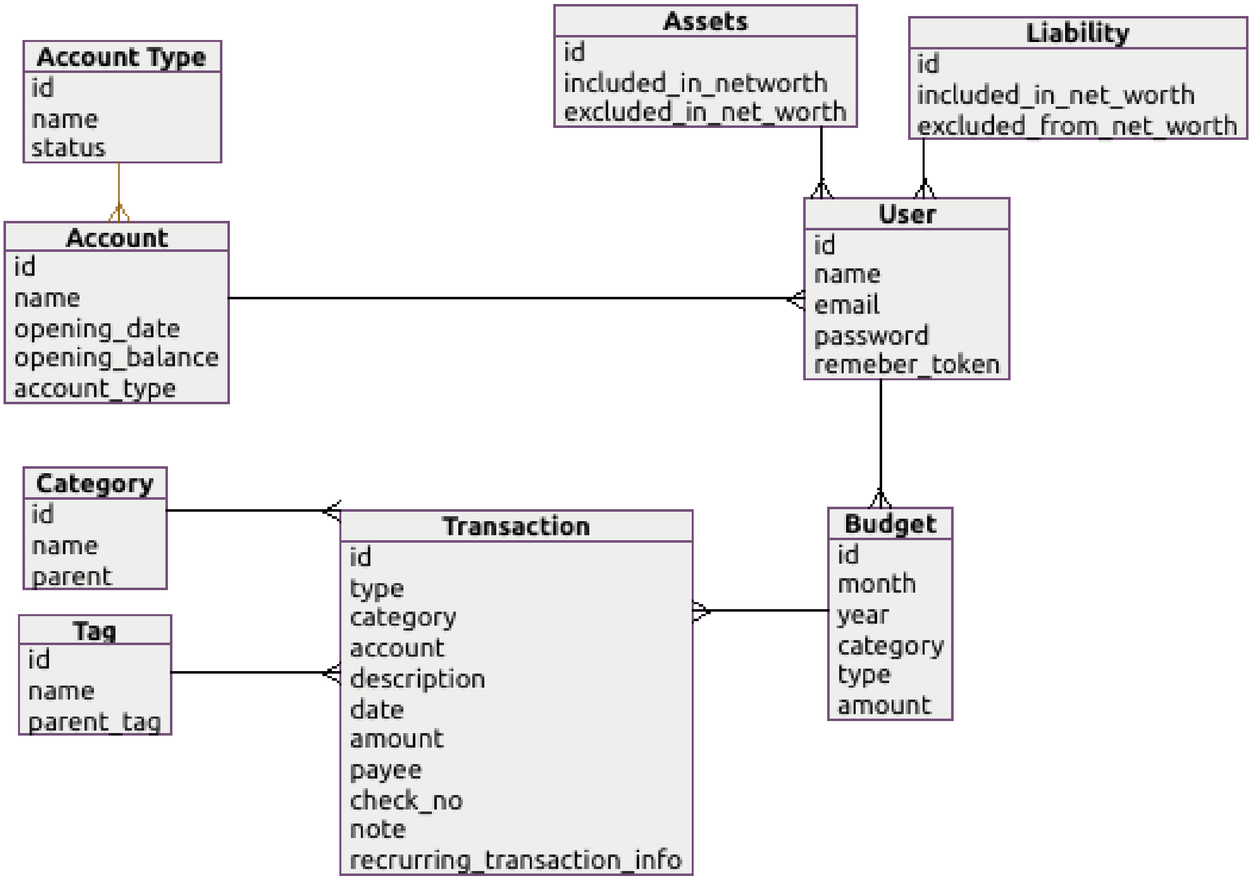

Figure 11: Entity relationship diagram

9.6 Sequence Diagram

Sequence diagrams of this personal finance management system are:

- Sequence diagram for registration:

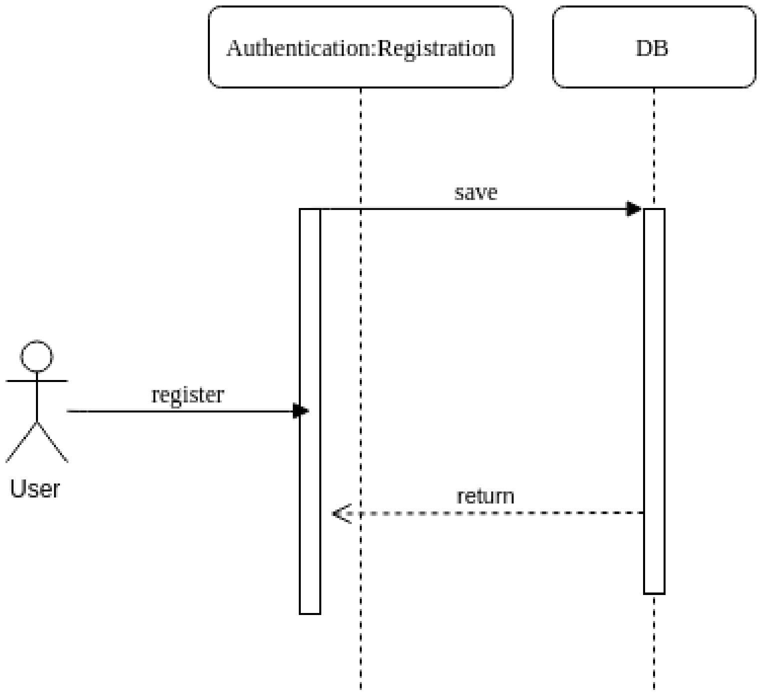

Figure 12: Sequence diagram for user registration

- Sequence diagram for user sign in

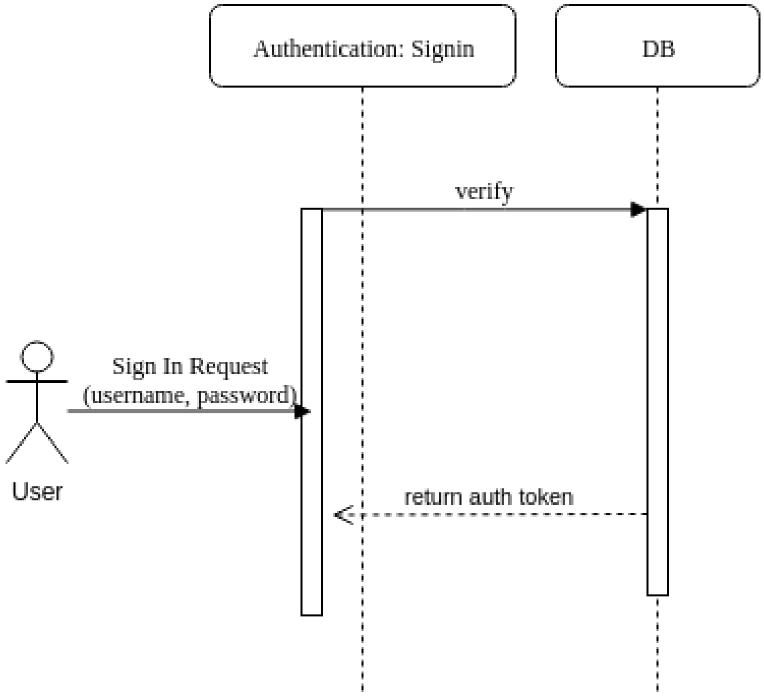

Figure 13: Sequence diagram for player information insert

9.8 Activity diagram

Activity diagrams of personal finance management are:

- Overall activity diagram for finance management:

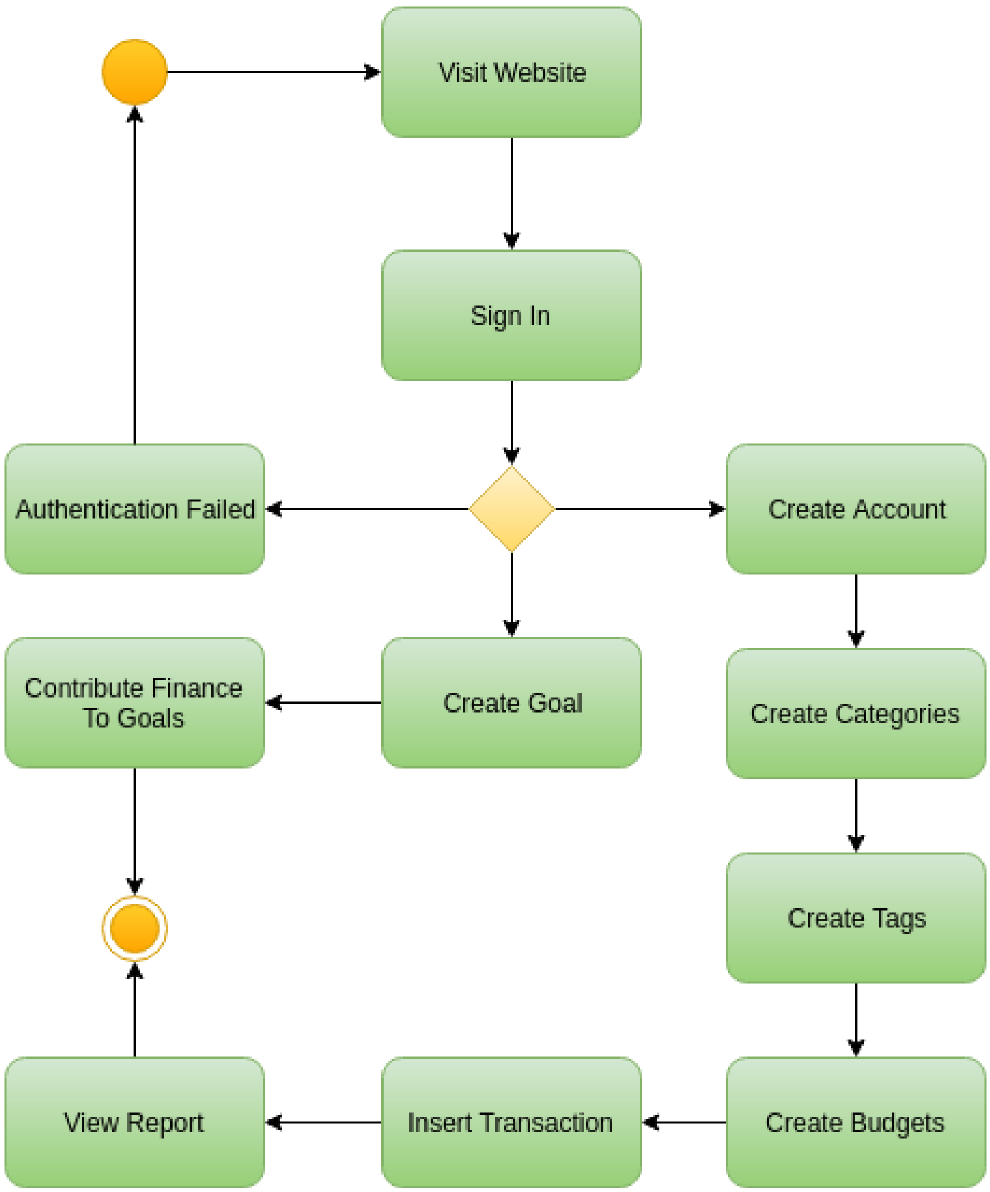

Figure 31: Overall Activity Diagram

- Activity diagram for reporting:

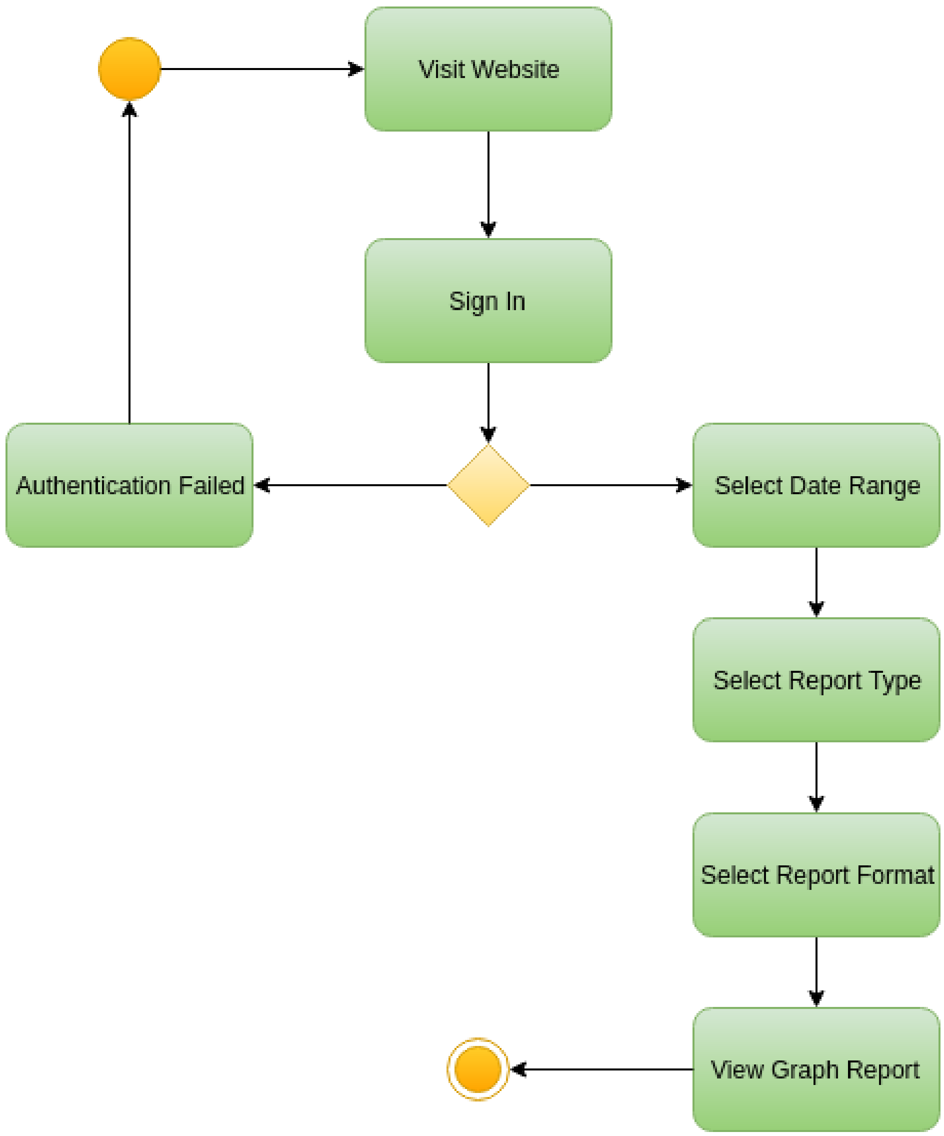

Figure 32: Activity diagram for reporting

- Activity diagram for budgeting:

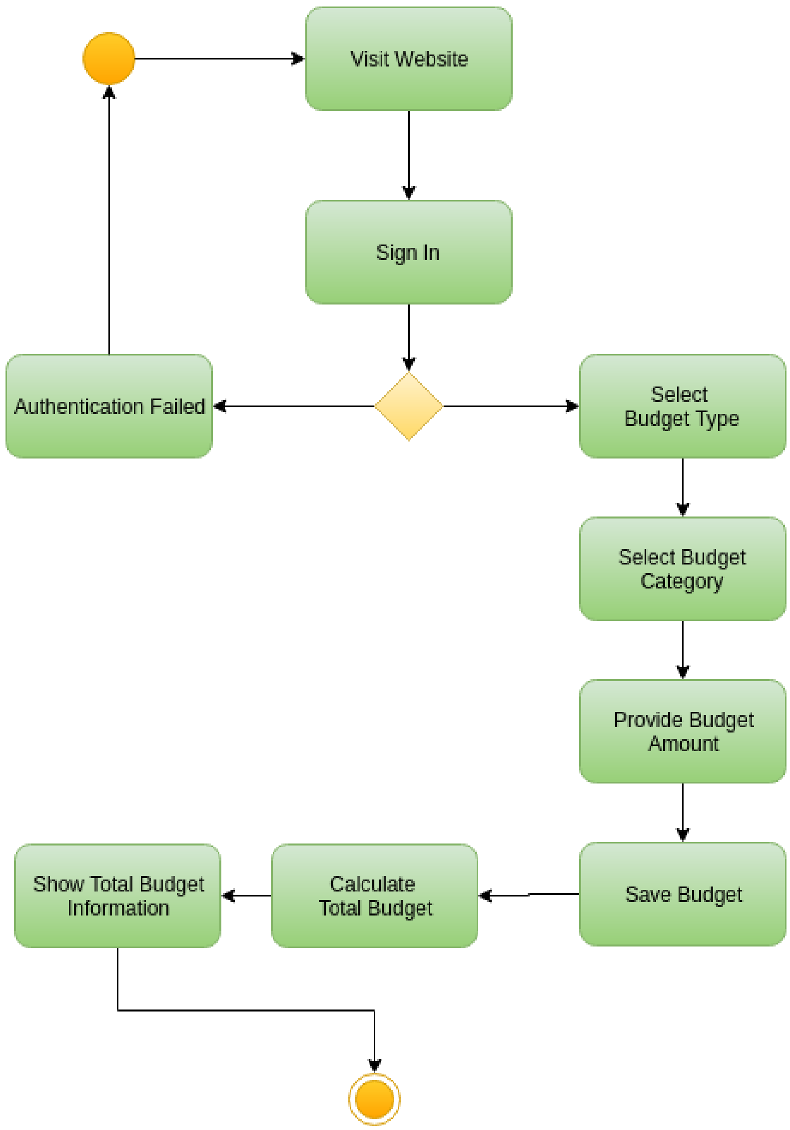

Figure 33: Activity diagram for staff insert

9.9 Deployment Diagram

Deployment diagram of the proposed system:

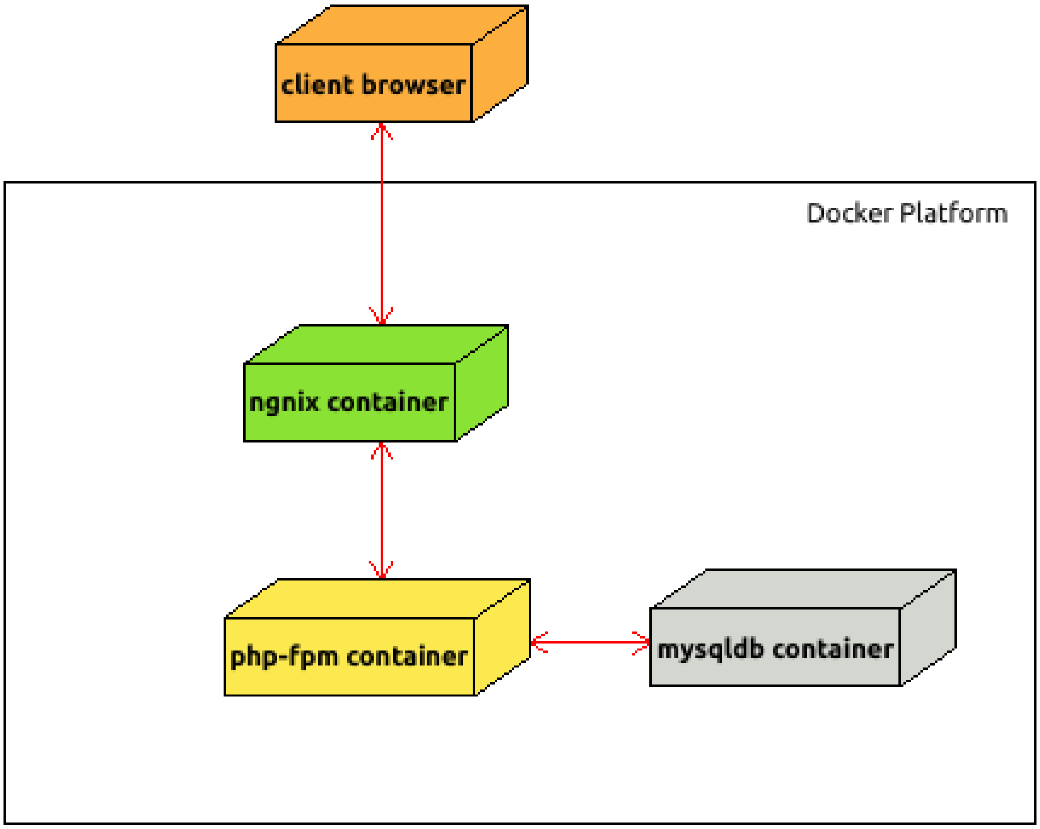

Figure 36: Deployment diagram of personal finance management.

9.10 System Prototype:

- Overview Graph:

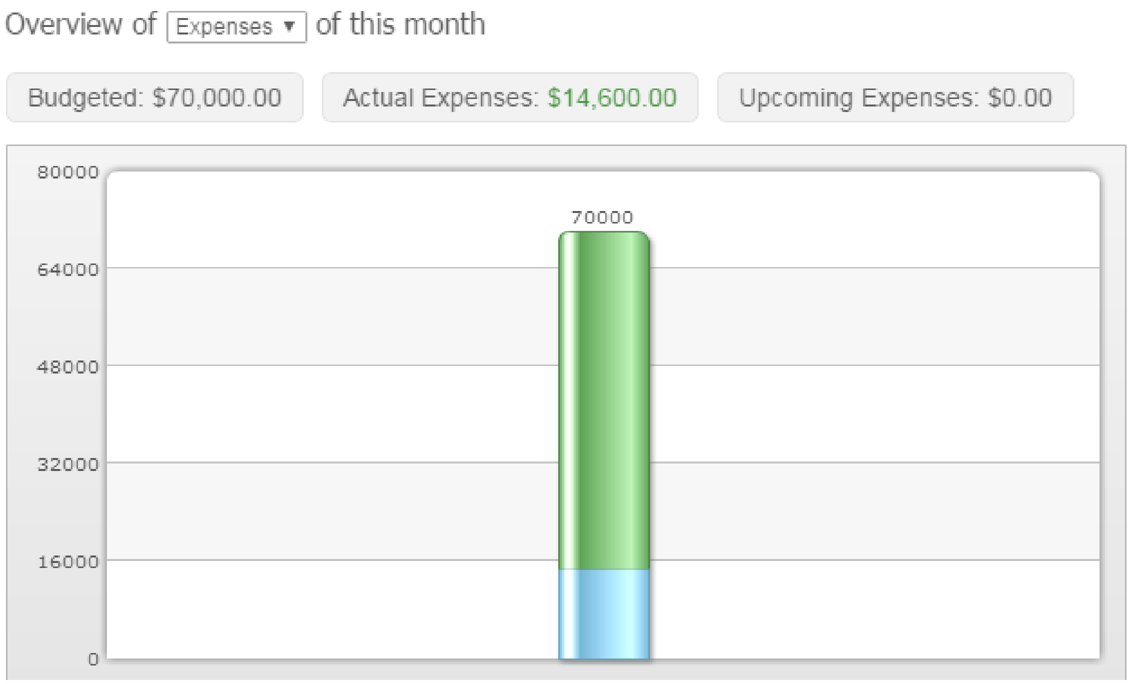

Figure 37: Prototype of Overview

- Cash Flow Graph:

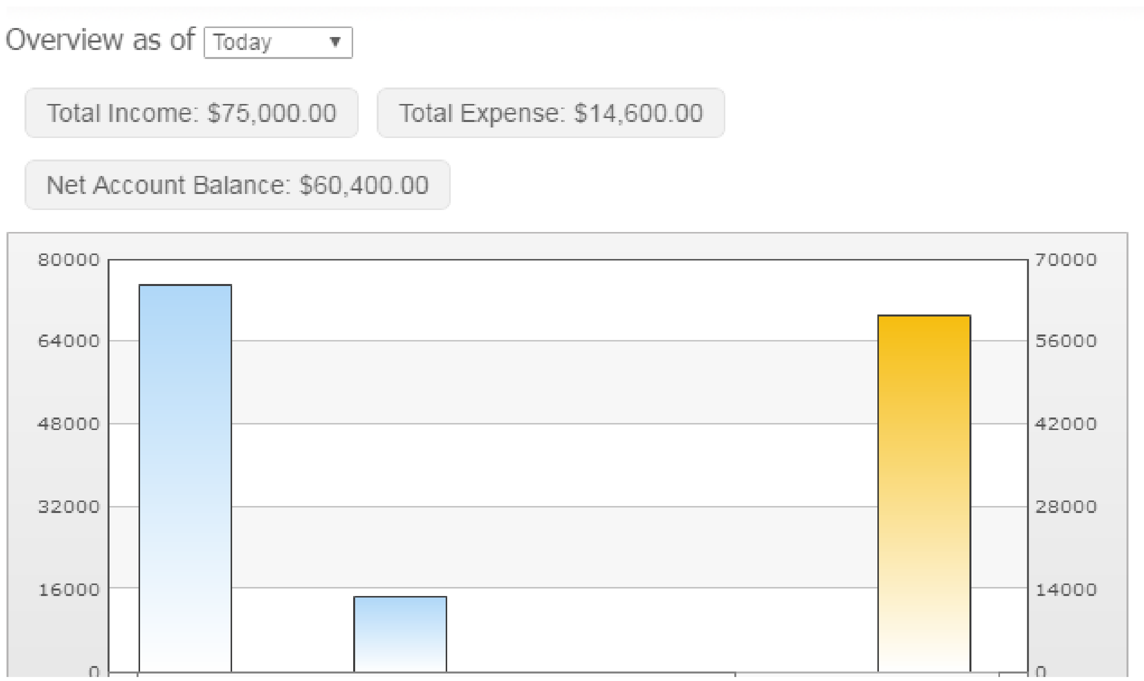

Figure 38: Prototype of Budgeting page

- Income Graph:

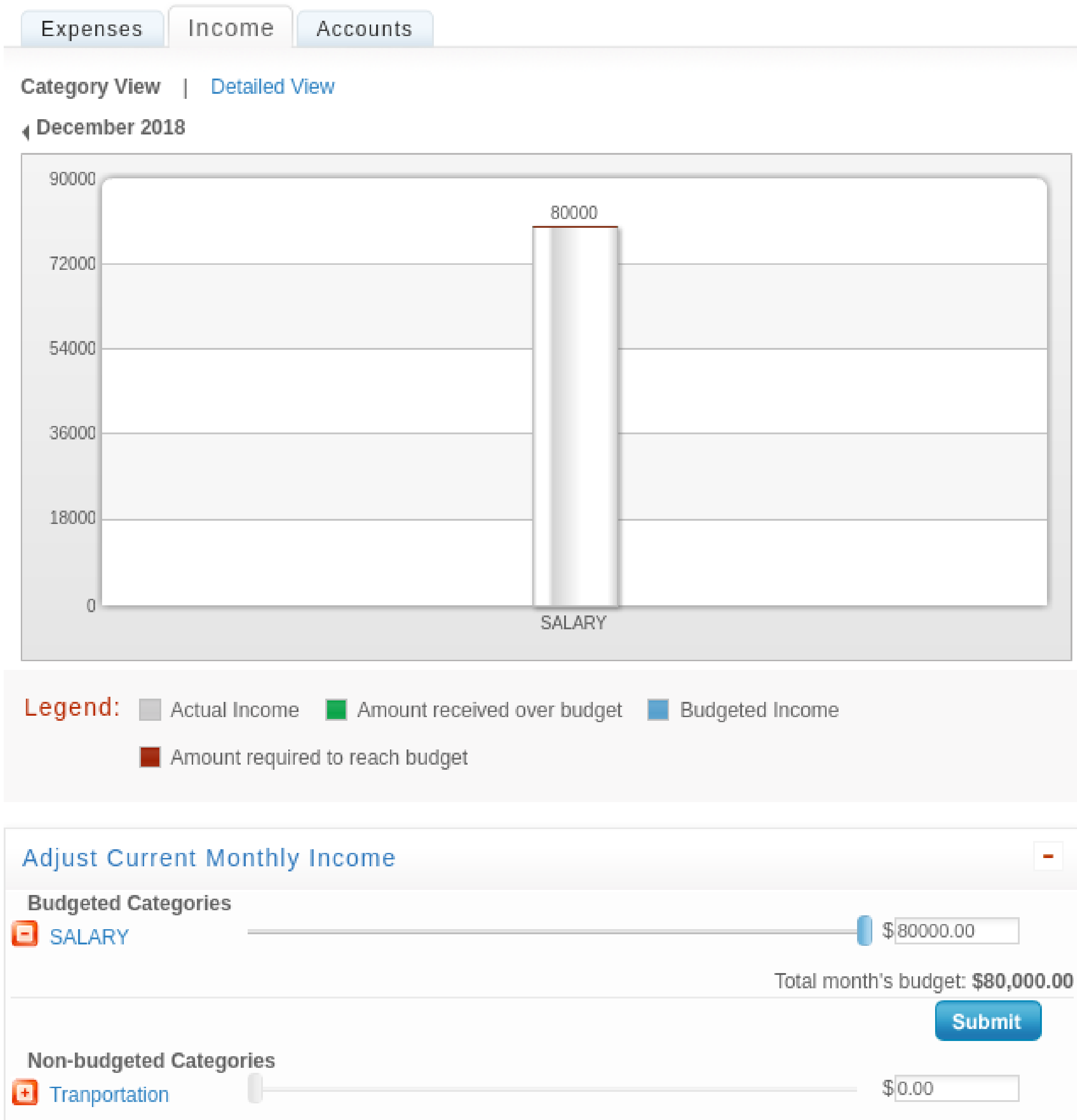

Figure 39: Prototype of Income Graph

- Expense Graph:

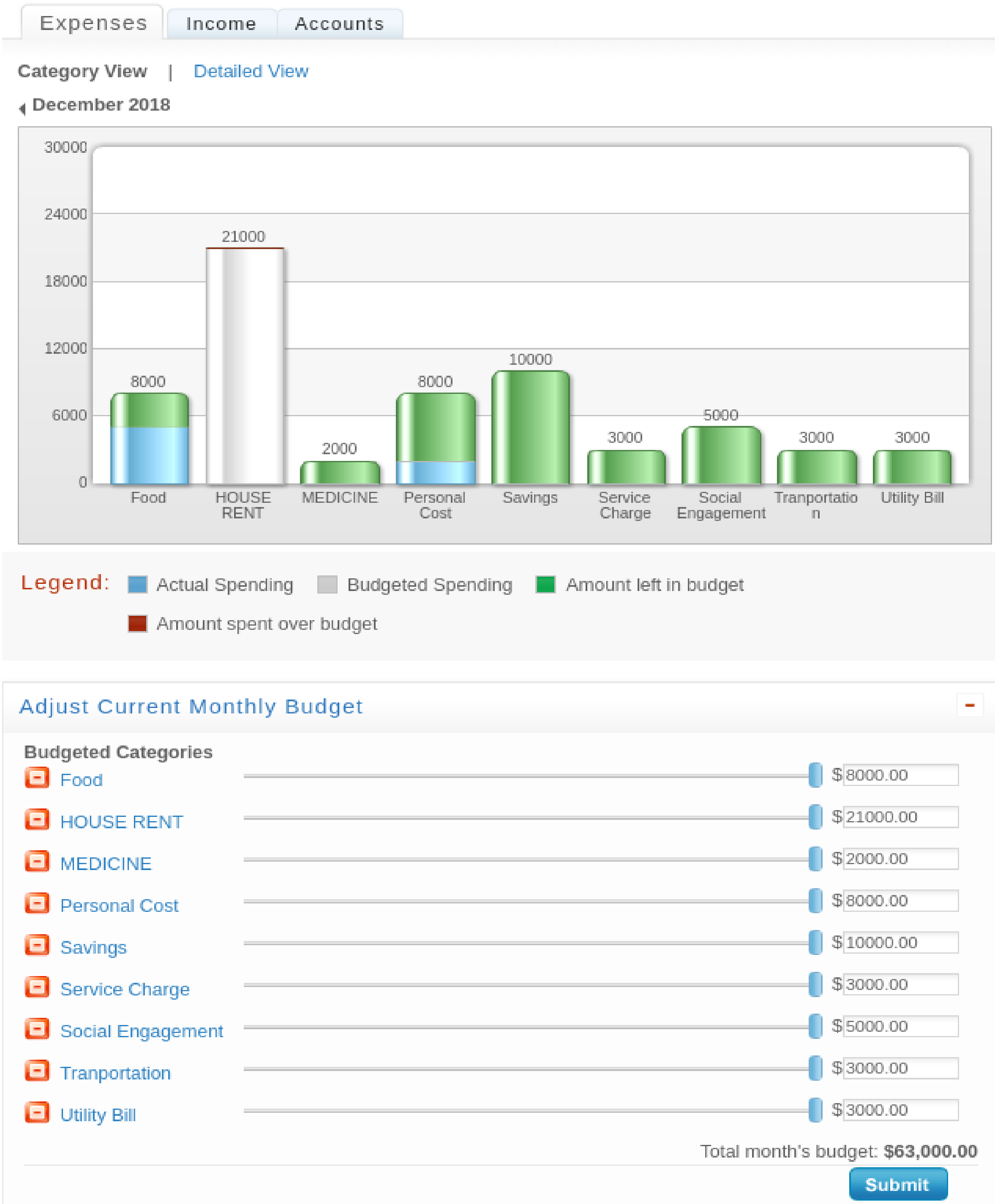

Figure 40: Prototype of Expense Graph

- Account Graph:

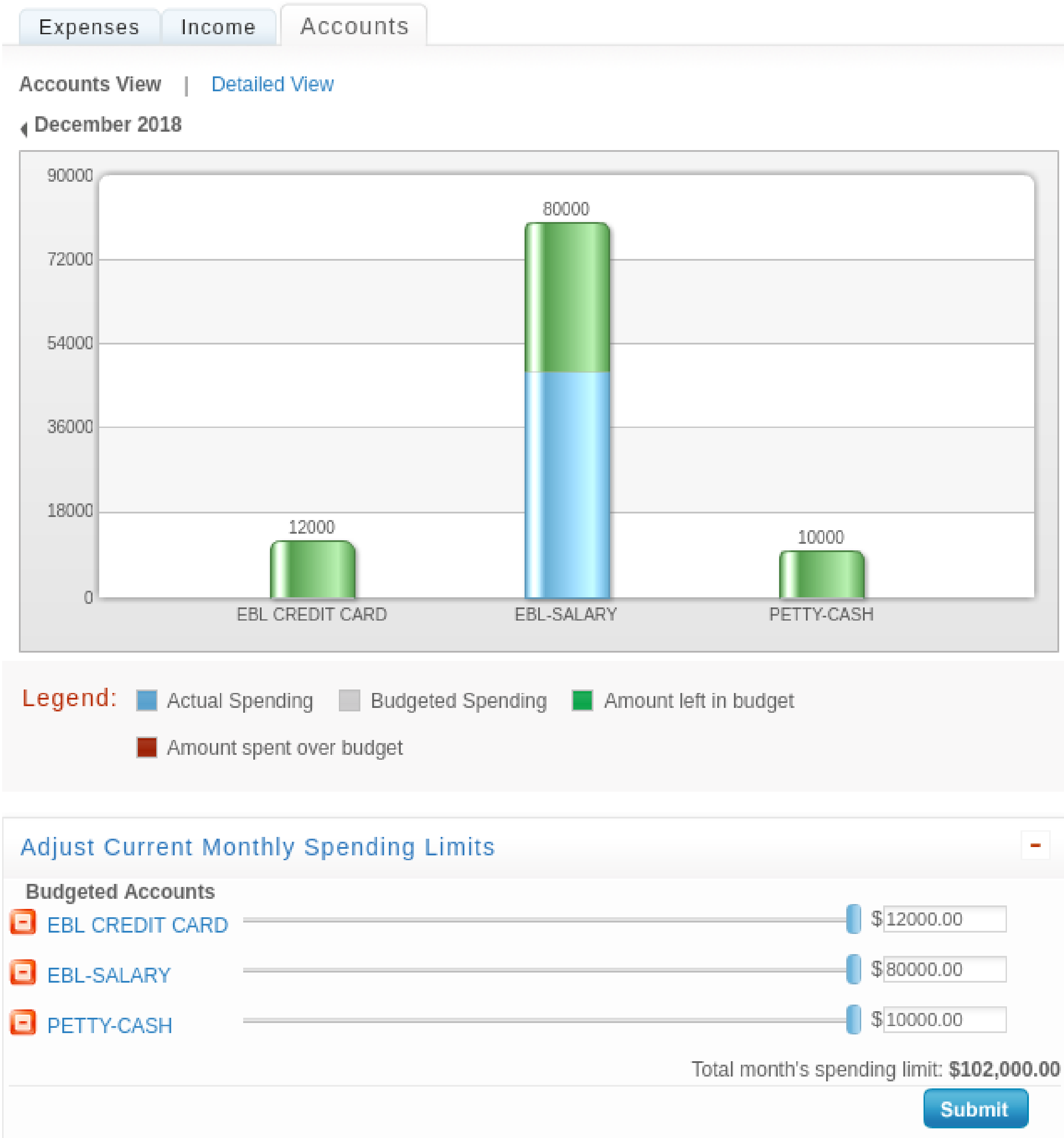

Figure 41: Prototype of Account Graph

- Transaction:

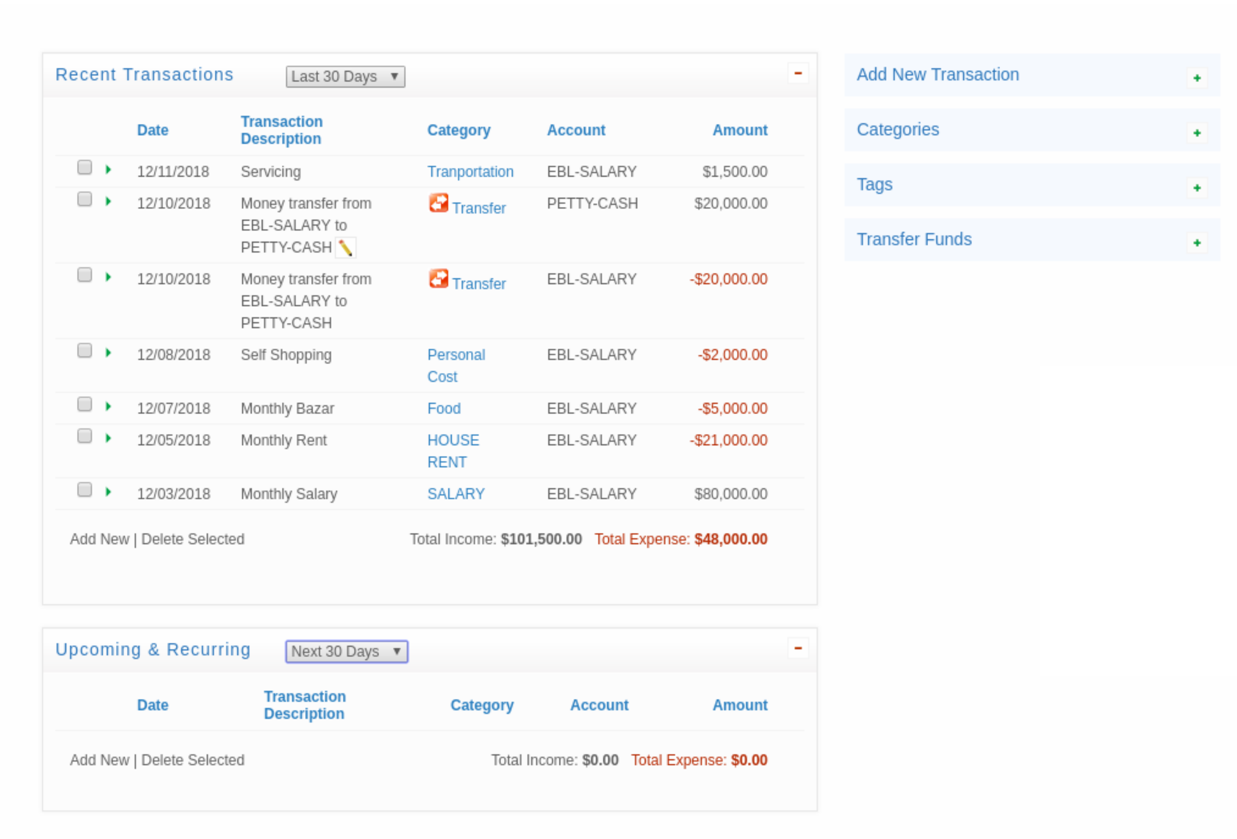

Figure 42: Prototype of Transaction

- Goal Graph:

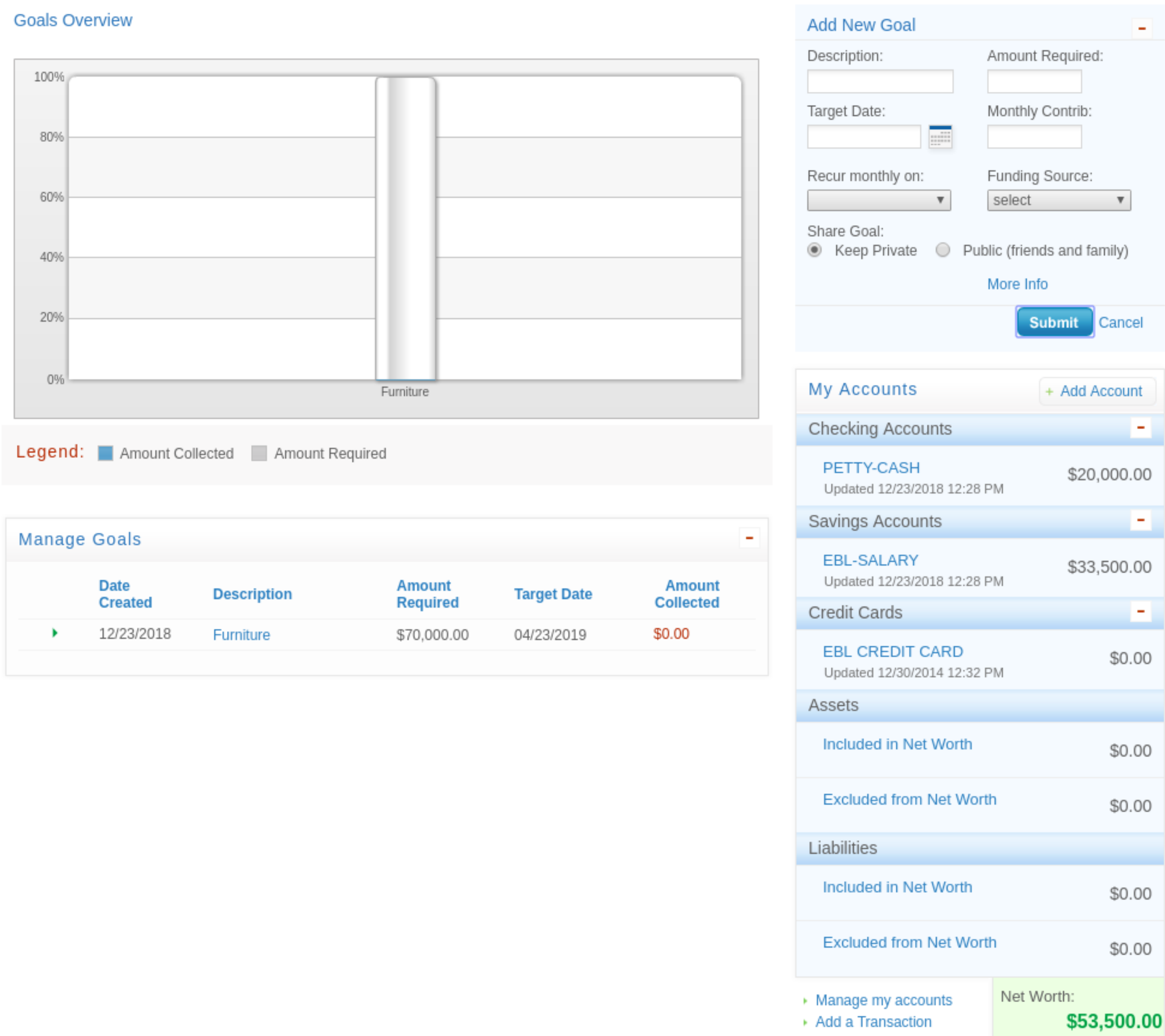

Figure 43: Prototype of Goal

CHAPTER 10: DEVELOPMENT

Personal finance management system that is being developed is a web application. So, in this phase most of the tasks are coding related. All tasks are broken down into multiple sections according to user interface design and system's functionality. This phase is the backbone from all of the phases to complete the project successfully.

10.1 Tools for Development:

This personal finance management web application is developed based on php is used as core language. User interface of this system is developed based on CSS framework bootstrap and HTML and JavaScript. MySQL 5.7 is used as database management system and PhpStrom is used as integrated development environment. All types of validations are implemented by using HTML and Javascript control.

10.2 Time boxing:

Time boxing is one of the key components of DSDM Atern which is a constrained timeframe inside which very much characterized deliverable must be created with given assets. By keeping up time box the advancement of the venture has additionally been sorted out. Here, a period box has been kept up for this individual back administration framework where each separated assignment has been designated inside a restricted time span to sort out the advancement of this task effectively.

No.	**Start Date – End Date**	**Duration (Day)**	**Deliverables**
1	25 June – 2 July	8	- Analyzing system architecture
2	3 July – 15 July	12	- Prepare architecture - Finalize UI design
3	16 July – 30 July	15	- Prepare development infrastructure - Database Design
4	1 August – 30 August	30	- Development of Backend
5	1 Sep – 15 Sep	15	- Development of UI
6	16 Sep – 20 Sep	5	- Deployment
7	21 Sep – 5 Oct	15	- Testing

10.3 System main task break down

- Application portal
  - ➢ Design and develop the application portal
  - ➢ Provide necessary information into the portal.
- System front-end
  - ➢ Design and develop whole system's front-end.
  - ➢ Create proper navigation
- System database
  - ➢ Gather entities from manual processing method
  - ➢ Design whole system's database.
  - ➢ Set proper attributes for all entities.
  - ➢ Create relation between entities.
- Sign in and user authentication
  - ➢ Create sign in page and user interface.
  - ➢ Create session for sign in
  - ➢ Set user authentication
  - ➢ Test sign in

10.4 Coding Samples of Module

- **Transaction model:**

```
<?php

namespace App\Models;

use Illuminate\Database\Eloquent\Model;
use Illuminate\Database\Eloquent\SoftDeletes;

class Transaction extends Model  {
use SoftDeletes;

/**
* The database table used by the model.
*
* @var string
*/
protected $table = 'transactions';

/**
* Attributes that should be mass-assignable.
*
* @var array
*/
protected $fillable = ['type_id', 'category_id', 'account_id', 'description', 'date',
'amount', 'payee', 'check_no', 'recur_transaction_info_id', 'note', 'user_id', 'deleted_at'];

/**
* The attributes excluded from the model's JSON form.
*
```

```
* @var array
*/
protected $hidden = [];

/**
* The attributes that should be casted to native types.
*
* @var array
*/
protected $casts = [];

/**
* The attributes that should be mutated to dates.
*
* @var array
*/
protected $dates = ['date', 'deleted_at'];

}
```

- **Transaction Repository:**

```
<?php
/**
* Created by PhpStorm.
* User: alam
* Date: 12/2/18
* Time: 8:18 PM
*/

namespace App\Repositories;

use App\Models\Transaction;

class TransactionRepository implements RepositoryInterface
{
protected $model;

public function __construct(Transaction $model)
{
$this->model = $model;
}

// Get all instances of model
public function all()
{
return $this->model->all();
}

// create a new record in the database
public function create(array $data)
{
return $this->model->create($data);
}

// update record in the database
public function update(array $data, $id)
{
$record = $this->find($id);
return $record->update($data);
```

```
}

// remove record from the database
public function delete($id)
{
return $this->model->destroy($id);
}

// show the record with the given id
public function show($id)
{
return $this->model->findOrFail($id);
}

// Set the associated model
public function  setModel($model){
$this->model = $model;
return $this;
}

// Eager load database relationships
public function with($relations){
return $this->model->with($relations);
}

}
```

CHAPTER 11: TESTING

11.1 Test Case

Several test case of personal finance management system provided below:

Test Case Number: T01	
Title	**Explanation**
Project name	Personal Finance Management
Test Case Name	System Sign In
Required Steps	• Provide username & password • Click Sign In button
Expected-Outcome	Sign in successfully
Actual-Outcome	Sign in successfully

Test Case Number: T02	
Title	**Explanation**
Project name	Personal Finance Management
Test Case Name	Store account information
Required Steps	• Provide all required account information • Click submit button
Expected-Outcome	Store account information successfully
Actual-Outcome	Account information stored successfully

11.2 Unit Testing

Unit testing for sign in:

Procedure	**Expected-Outcome**	**Actual-Outcome From Testing Result**
No username and password provided	Show messages for providing username and password	Sign in failed and message showed for providing username and password
Invalid username and password provided	Show messages for invalid username and password	Sign in failed and message showed invalid username and password.
Correct username and password provided	Sign in to the system and redirect to create player page	Signed in successfully and redirected to create player page.

11.3 Integration Testing

Integration testing is important to check all module is working with sub dependency. Integration module is also check expecting outcome will generated after integration.

11.4 Validation testing:

Validation testing is important testing. As cause invalid data or information will create issue on application. It also generate issues to view data, searching exact data and report generation. Validation testing for personal finance management system states below.

Input	**Execution-Outcome**	**Reason**	**Result**
Provide user name which already exists and active	Show message user already exists.	System checked previous data with input data.	Success

11.5 Compatibility testing

Compatibility testing check application compatibility with different platform. Compatibility testing check states below.

Platform of Test	**Execution**	**Expected-Outcome**	**Actual-Outcome**
Google Chrome	Yes	Successfully meet requirements	Successfully meet requirements
Mozilla Firefox	Yes	Successfully meet requirements	Successfully meet requirements
Mobile View	Yes	Successfully meet requirements	Successfully meet requirements

11.6 Security Testing

As a web application security testing is one of the important parts. Through security testing system's security is measured when it will be operated via online. Here I have given several security test results of this information management system.

Provided Input	Execution-Outcome	Reason	Result
Invalid username and password	Show message invalid username and password	Application checked the user is authorized or not.	Success
Valid username and password	Signed in and redirect to dashboard	Correct username and password	Success
If system is not used application automatic sign out after 30 minutes.	Application sign out and if any one tries to access then he can't	Application automatic destroy session after 30 minutes.	Success

11.7 Acceptance testing

Acceptance testing is generally testing the system by users and measuring user-centered interaction design. So, that is why some of the club management and staffs are invited to test the system.

Their feedback's are shown below in graphical view form different perspectives of the system.

- System's features and functionalities:

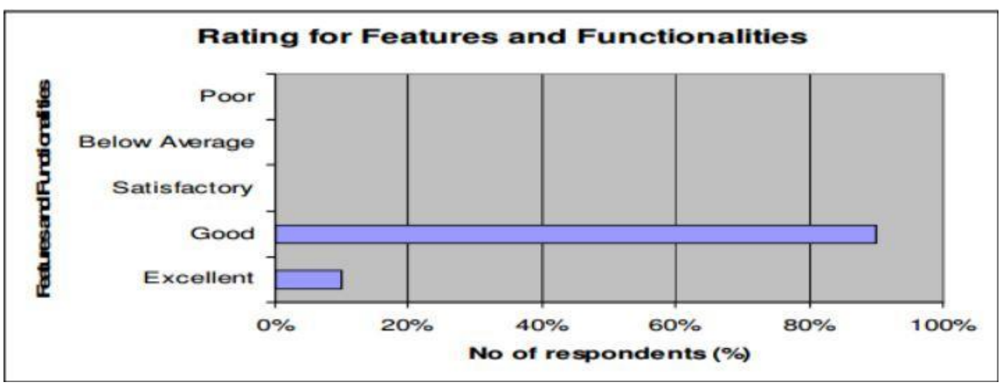

Figure 57: System's features and functionalities' success rate from user.

According to the user's feedback, system's familiarity rate is high.

- Daily work and operation:

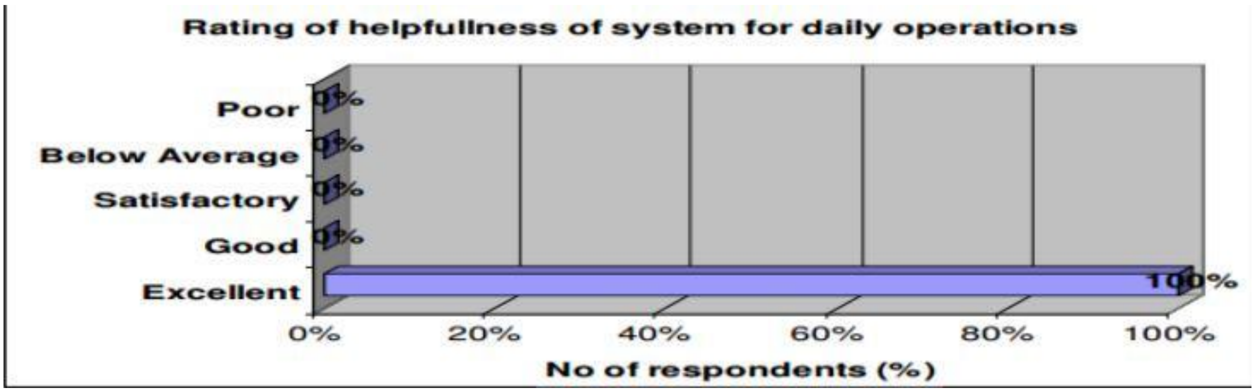

Figure 58: System's daily operation success rate from user

Stakeholder of personal finance management believes that the system is very helpful for their daily operation and it can support 100% for their daily activities.

CHAPTER 12: IMPLEMENTATION

Implementation of an application begins after successful testing on testing environment. Implementation of application require close attention on several phase such as environmental factor. Automated and continuous implementation will help for further development.

12.1 User Manual

After deployment and implementation of whole application, user manual require to add.

A user manual developed along with details information for user which help user to know how to user system. Along with this a public forum introduce to interact between user group. Public blog use to published articles related with personal finance management.

CHAPTER 13: EVALUATION AND CRITICAL APPRAISAL

13.1 Objective could be met

13.1.1 Success rate against each objective

From the examination and investigation on current issues of Personal Finance Management, a few goals had been recognized to build up the new data the board framework. A few meetings and perceptions encouraged such a great amount to finish a correct prerequisite rundown dependent on issue area. Those prerequisites records were organized into four areas that are must have, ought to have, could have and won't have this time by following MoSCoW prioritization.

Albeit a few destinations have been skipped or dropped off, the new framework is completely practical and meets the client needs since it is created dependent on client point of view. What's more, the framework has all usefulness to unravel essential issues of overseeing individual fund. So it tends to be said that the achievement rate of this framework against each article is great and worthy. Here is the subtleties:

Complete Requirement List		**Status**
RQ01	Store category information	Done
RQ02	View category information	Done
RQ03	Store account information	Done
RQ04	View account information	Further Development
RQ05	Store tag information	Done
RQ06	View tag information	Done
RQ07	Store transaction information	Done
RQ08	View transaction information	Further Development
RQ09	Store budget information	Done
RQ010	View budget information	Done
RQ011	Store goal information	Done
RQ012	View goal information	Done
RQ013	View budget graph	Done

RQ014	View income vs. expense graph	Done
RQ015	View time based income graph	Done
RQ016	View time based expense graph	Done
RQ017	View transaction graph	Done
RQ018	Store assets	Done
RQ019	View assets	Done
RQ020	Store Liabilities	Done
RQ021	View Liabilities	Done
RQ022	Export transaction	Done
RQ023	Export budget	Done
RQ024	Sync with bank account	Further Development
RQ025	Artificial intelligence for suggestion	Further Development

13.1.2 How much better could have been done

This administration framework has been created dependent on client's center needs. As this framework is created by following MoSCoW prioritization, so there are a few prerequisites in the 'could have' list that has not been executed into the new framework, for example, account exchange, singular profile and so forth. In any case, it doesn't influence the framework or framework's usefulness. In the event that these necessities were executed, the new framework would be extremely proficient and framework's prosperity rate would be a lot higher.

13.1.3 Why it could not be done

One of the main reasons for skipping or dropping off those requirements is limited short time frame. As this project is developed by following DSDM Atern, so this project must be completed within time frame. As an academic standalone project, one person had to do all things such as analysis, communicate with several user, interviews, development, testing, documenting which is a matter of lot of time. That is why those requirements need to be skipped. There are also some features such as AI and Block chain Integration etc. And these features need to be skipped for lack of skills, short time schedule. It needs a lot of time to develop those features because I had to analyze and gather knowledge about those features. That is why it needs to be skipped.

13.1.4 Objectives have been missed?

The objectives that are missed from the new management system are

- Completed User Manual
- Public Forum
- Public Blog

13.1.5 Why these objectives have missed

The majority of those prerequisites are recorded as 'won't have this time' and a portion of these are recorded as 'could have'. Along these lines, those prerequisites have no real effect framework. As recently depicted, constrained time allotment is one of the principle reasons. Alternate reasons are absences of assets, absence of learning about current innovation and somewhat poor examination. In any case, those necessities would be executed later on improvement.

13.1.6 What could have been done to complete those objectives?

As time is the main problem so by allocating extra time from stackholder, by collecting proper objective related resources, by proper analyzing in case taking suggestions from expert people, gathering update knowledge about current technology would be helpful to complete those objectives.

13.1.7 How better is the features of the solution?

The features of the newly developed management system are good enough to overcome the current problem of this system. The features that are implemented into the new system:

- Real time account synchronization
- AI feature to suggest better savings planning
- Block chain implementation to secure transaction and data

CHAPTER 14: LESSONS LEARNT

14.1 My learnings

Stakeholder needed to create individual back administration framework dependent on geological client conduct on their costs and pay. Most difficult part was accumulation data from a few sort of client. I figure out how to oversee and persuade client to give fundamental data. At the season of advancement and testing I take in a few innovation uniquely UI and Backend testing technique and apparatuses. This framework actualize on compartment based building which is new learning for me.

14.2 Problem I have faced

Throughout this whole project I have faced various problems. Those problems mainly occurred in analysis and development part. Here is the list of those problems.

- First of all it is an academic standalone project, so I had to do all things and it is one of the difficult problems.
- Implementing DSDM Atern properly is one of the important problems that I have faced due to standalone project development.
- Gathering requirements through interviews is also another problem because user not willing to provide their financial data.
- Maintaining regular communication with stack holders was quite difficult due to time issue.
- Designing the whole system perfectly is another problem that I have faced so that it can support any change in further development and deliver the user a proper view. That is why I had to change the whole design two times.
- Another complex issued was designing a proper squad and match details so that it can provide run time information.
- I have also faced some difficult query problems for publishing different types of report.
- Designing and developing several charts was a bit complex and time consuming.
- Other than those problems, I have faced a lot of times small and large coding problem during development

CHAPTER 15: CONCLUSION

15.1 Project summary

This project is developed for stack holders to implement end user system to managing their budgets and personal finance. Using personal finance management system user will able to manage their daily transaction based on category and can track their budget expense and income. Reporting is the main feature of this system which help user to know their current personal financial status.

15.2 Project goal

The main goal of this project is to deliver a digital computerized personal finance management system to end user to overcome their issue at current manual process.

15.3 Project success

Project's success depends on achieving the project goals. Although a few features have been missing but most of the goals have been achieved in this new system which fulfill user's core needs and the project's success is countable. Those missing features will be implemented in the system in further development.

15.4 What I state at this documentation

I have explained all of my activities in every phase step by step in this documentation. At first project proposal has been included in this documentation to introduce which project that is going to be developed. Then I have discussed problem domain and solution based on published articles about this type of system. Similar types of systems and their features have also been mentioned. Then I have described some approaches that will be followed. I have described about the chosen methodology. Whole project planning is also elaborated in this documentation. Then project feasibility, cost benefit analysis, data gathering techniques and requirement lists are represented in this documentation. Then I have described about old manual system and prioritized the requirement list. Then I made use case, activity, class, sequence and deployment diagram for the proposed system. Development part has been described and some coding samples are represented in this documentation. Different types of testing are described that are performed on this new system to maintain quality. At last, I have described about implementation plan how this system will be implemented.

15.5 My experience

I got a life time experience from this project development. Meeting with people, interviews, questionaries' are different types of experience that I have got. I have also gathered a lot of knowledge about methodology and its implementation in real life project development. Analyzing part helps me to realize about thinking different perspectives of a scenario. This project is developed based on PHP and several Web language. As an engineer I learn lot of new helper technologies such as codecept, docker etc which help me to improve my further career and knowledge.