Software Requirements Specification

for

Budget Control System

Version 1.0

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The product described in this SRS document is the software: Budget Control System. Software's release number is 1 and revision number is 0.

Furthermore, The scope of the project covered in this document is as follows: it mentions relevant details of full system from the purpose of the whole system, different external interfaces of the whole software, brief description of functional & nonfunctional requirements of full system and glossary of words used in our project documentation.

For part of systems there are Analysis Models available and lists to be determined.

1.2 Document Conventions

Requirements highlighted in yellow are crucial to the system. They are core functionalities of the system. Moreover, the document may use a few short forms that are described briefly below.

- SRS: Software Requirements Specification –

  Document that gives complete description of the intended purpose of a software

- BCS: Budget Control System –

  Name of our software

- GUI: Graphical User Interface –

  The experience of user when it interacts with the system

- Web-based application: -

  Application that will be run on the Internet

- SQL: Structured Query Language –

  Language used to write queries to add/delete/update or retrieve data from database

- HTM: Hypertext Markup Language –

  Standardized system for tagging text files to achieve hyperlink effects

  on World Wide Web pages

- JavaScript:

  A scripting language that enables you to create dynamically updating content

- CSS: Cascading Style Sheets –

  Describes how HTML elements are displayed on screen

Priorities for higher-level requirements are assumed to be inherited by detailed requirements.

1.3 Intended Audience and Reading Suggestions

The document is intended for evaluators, developers, project managers, stakeholders, users, testers and documentation writers. The rest of the document contains a brief description of all the functional/non-functional requirements of BCS. It also mentions the difficulties we may or may not face during the development process. Furthermore, we will be mentioning the tools we intend to use and attach pictures of GUI, Analysis models like sequence diagrams to help readers get a better idea of what they can expect from our system.

Suggested sequence to read the document varies according to the type of reader. All readers are advised to begin reading from the overview sections and then proceed in the following manner:

If the reader is a user, they can jump to section 3 and if the reader is a tester the next appropriate section will be section 4, 5 and then 6B. Developers are encouraged to next read section 4 and 5 and rest can proceed in the same order of the document.

1.4 Product Scope

With the growing inflation rate in Pakistan, People are desperate to find means to control their daily expenses. Many fail to do so because they can't find the time to thoroughly analyze their spendings and find cheaper alternatives that both satisfy their need and help them stay within their budget without compromising on quality. This is why we have come up with the Budget control system.

Our system can help promote companies that sell the same products or provide services, with cheaper prices hence would help in eliminating companies that have unfair charges and aware users of their alternatives.

Scope of the project is to:

1) Analyze user's expenses & generate report

2) Given a description, find product/services that match & are within user's budget

3) Suggest user the areas to make changes to help them stay within budget

4) Generate Report to user of improvements made

5) Display history of purchases to user

6) Allow user to rate / review products or services

7) Allow user to view ratings & reviews of products or services

8) Manage user's points

1.5 References

https://www.yourarticlelibrary.com/accounting/budgetary-control-accounting/making-a-successful-budgetary-control-system-financial-analysis/67767#:~:text=The%20following%20points%20highlight%20the,%2C%20and%20(7)%20Motivation.

https://www.iedunote.com/budgetary-control

https://hbpublications.com/2020/06/17/the-5-step-budgetary-control-process/

2. Overall Description

2.1 Product Perspective

The product is a replacement for certain other existing budget control systems available online that provide similar but not all the requirements mentioned in this documentation. Moreover, This SRS document briefly describes the whole larger system.

2.2 Product Functions

1) Take as input user's daily spendings & user's budget
2) Generate a report from user's spendings & user's budget
3) Identify areas user is exceeding the set budget & can improve
4) List down products/services that satisfy user's needs & are under the set budget

2.3 User Classes and Characteristics

User Classes that might use this product are:

1) Regular Customers
Will be using the software the most. They will use all the functions provided by our software. Technical expertise will be less for them. Security will be high. The data of one user cannot be accessed by any other user. Education level or experience expected is medium.

2) Occasional Customers
Will be using the software the least. They will use one or two of the functions provided by our software according to their desire & one time only. Technical expertise will be less for them. Security will be high. The data of one user cannot be accessed by any other user. Education level or experience expected will be medium

3) Professional Programmers/Developers
Will be using the software frequently. They will use all of the functions provided by our software. Technical expertise will be high for them. Security will be high. Education level or experience expected will be High

4) Testers
Will be using the software rarely to test only. They will use all of the functions provided by our software one by one to test. Technical expertise will be high for them. Security will be high. Education level or experience expected will be High

5) Companies/Businesses
Will be using the software moderately . They will use some of the functions provided by our software. Technical expertise will be medium for them. Security will be high. Education level or experience expected will be medium.

User class 1, 3, 4 & 5 are most important to satisfy.

2.4 Operating Environment

Software will operate in a normal work or home environment. The hardware platform includes keyboard, laptop , mouse & desktops. Any operating system version will work well with the software. This software should peacefully coexist with any other software applications or software components.

2.5 Design and Implementation Constraints

This software limits concurrent users to 250. The software does not provide downloading of information. All available information will be online & records will also only be saved online. The system must be user friendly . The software must ensure integrity of the user's information and no user information will be shared to any third-party without the consent of the user first.

Visual Studio & Microsoft SQL server will be used to deal with user's information and provide interface. Language used should be JavaScript, C#, sql. Moreover, Communication Protocols like TCP , HTTP , IP , HTTPS will be used.

Lastly, the Customer's organization will be responsible for maintaining the delivered software. If any additional maintenance guidance is required from our team, it will be subject to additional charges that include $900 per session.

2.6 User Documentation

User documentation components include 'BCS complete guide' handbook , in addition on-line help from www.howtousebcswebsite.com can be explored. Tutorial to use our web-based application will be available on our website's homepage under the title 'Tutorial'. User documentation delivery format will be online & print.

2.7 Assumptions and Dependencies

1) User knows how to use a web-based application.
2) User provides valid & sufficient information each time.
3) The input format is in numbers or strings
4) User does not wish to be provided with a downloadable copy of generated reports
5) Information of prices from companies is assumed to be reliable.
6) Companies / services general information listed from the internet is assumed to be reliable.
7) It is assumed that at any given time concurrent users cannot exceed 250.
8) Products/services selected by user's through our system were also purchased in real life.

3. External Interface Requirements

3.1 User Interfaces

Our website has an easy to use interface which helps users to easily navigate through the website. The simplicity of the designs will help our user to access the website easily and to get things done quickly. Following figures show some of the sample website images.

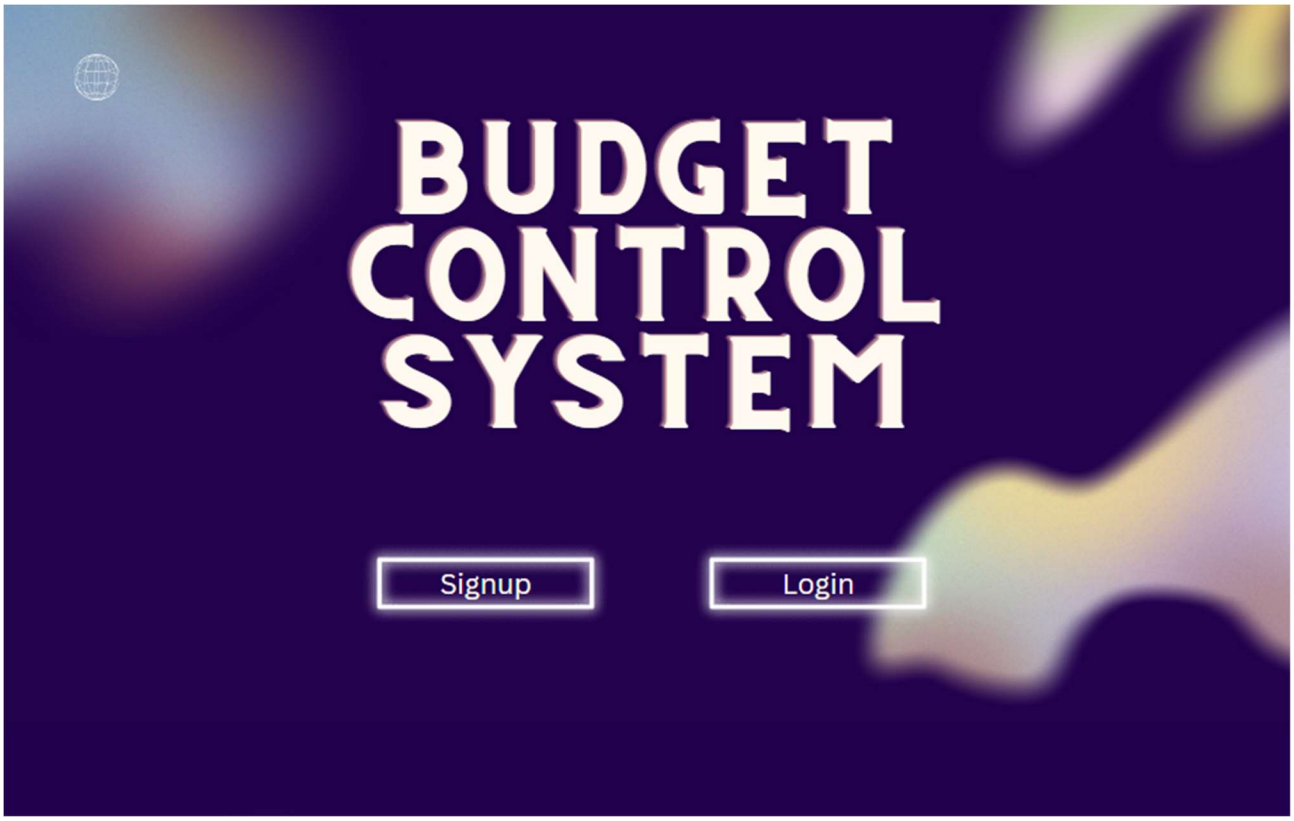

Figure 3.1.1: Welcome Page

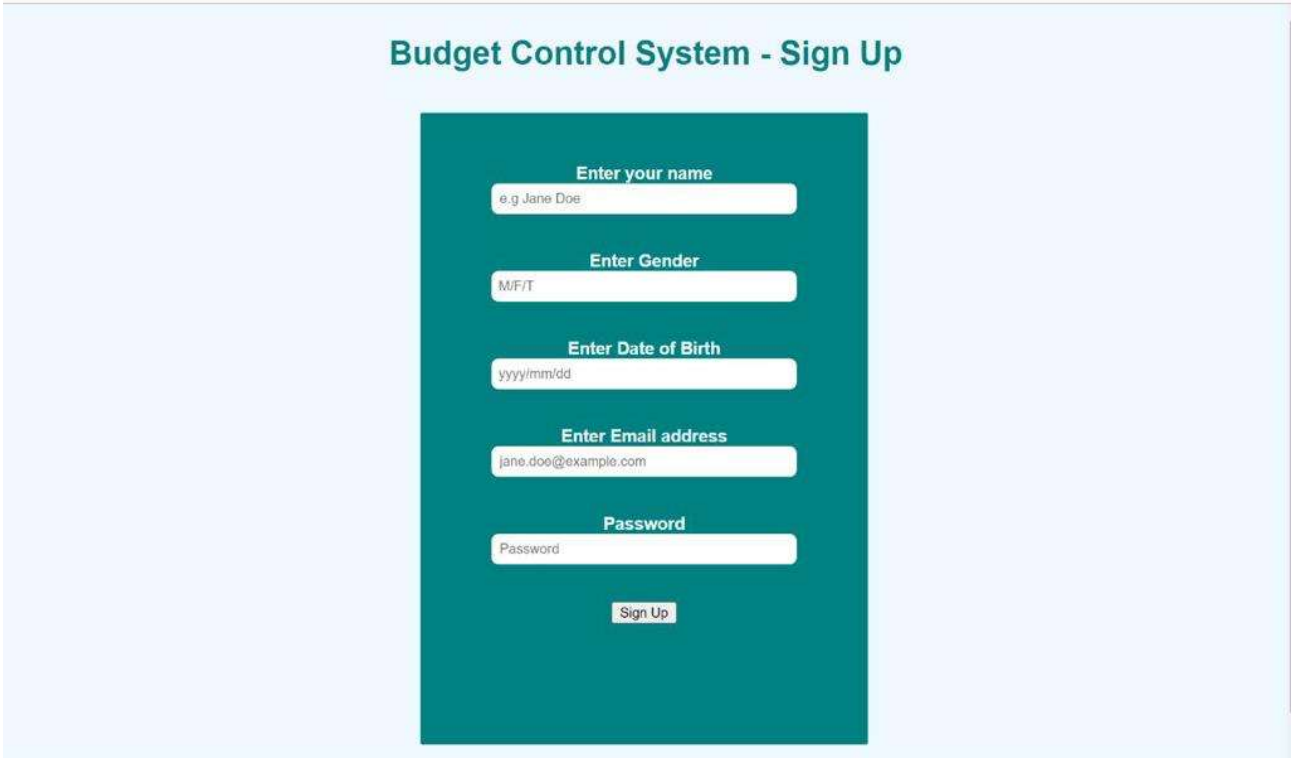

Figure 3.1.2: Sign Up Page

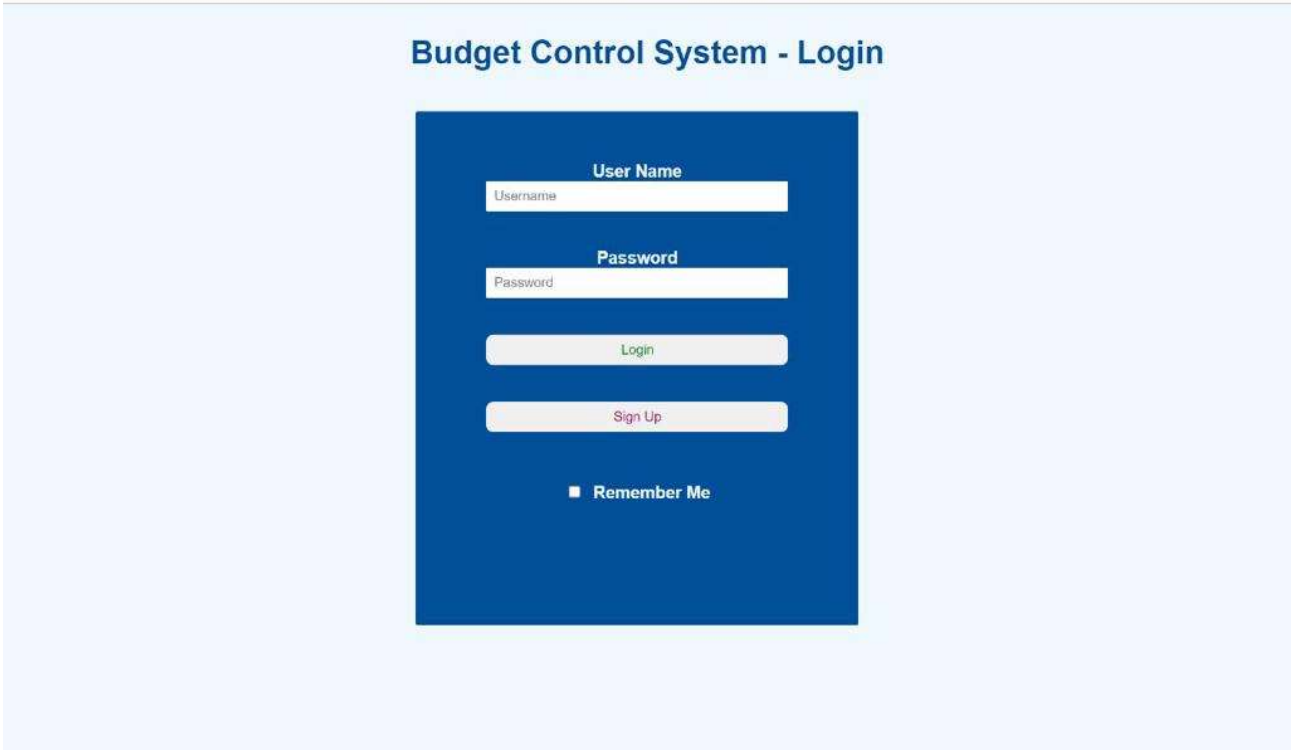

Figure 3.1.3: Login Page

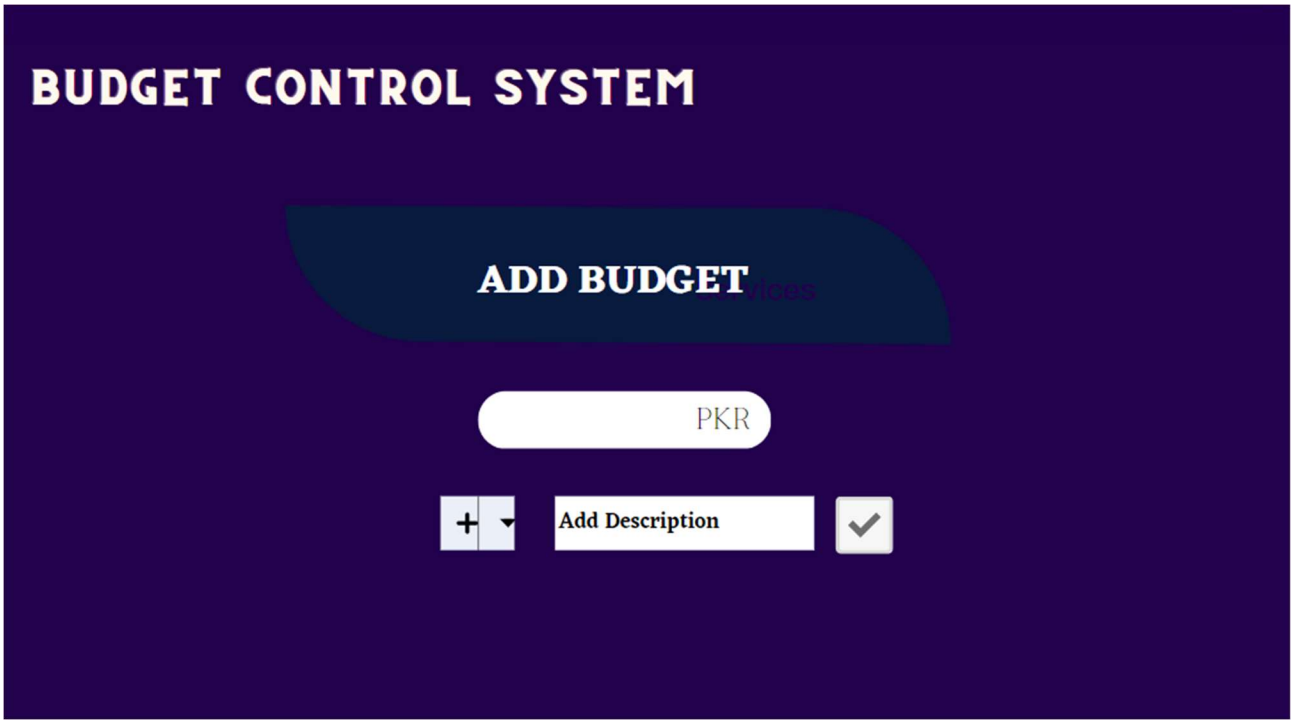

Figure 3.1.4: Add/Edit Budget Page

3.2 Hardware Interfaces

The hardware required for the software product shall include the following:
- Personal Computer
- Internet
- Hardware Peripherals

The supported devices for the system shall include Windows 32-bit or Windows 64-bit
Since the application must run over the internet,the hardware required to connect to the internet shall also be included. For example, WAN-LAN cable, ethernet cross cable, Modems etc.
The user would require a stable internet connection to access the application through their personal computer.

3.3 Software Interfaces

The software components required for the product are as follows:
- Microsoft SQL Server Management Studio 2014
- Visual Studio 2020

The software is mainly designed for Windows 7, Windows 8 and Windows 10. The libraries used for developing the software shall include JavaScript libraries such as Chart.js, React.js, etc

The data items used for the system would be as follows: numeric data item types,date and time data item types and character and string data item types. The numeric data item types will be used to calculate the total number of products users bought, the budget allocated for each item and the total expense of the user. The date and time data item types will be used to record the date and time of each transaction so it is easy to trace back to it. The character and string data item types are used for products, responsive messages, description of the product, etc

The Application Programming Interface used for communication will be Simple Object Access Protocol (SOAP) and Representational State Transfer (REST). These protocols will be used to share data over an HTTP connection. REST can transfer data in multiple formats which include HTML, media files and plain text.

3.4 Communications Interfaces

The system shall use the HTTP protocol for communication over the internet. Moreover the system uses HTML forms to get data from users. Moreover, communication interface requirements are as follows:

- CSS
- HTML
- Javascript

4. System Features

4.1 Login

4.1.1 Description and Priority

The user has to login to his/her account in order to access the application. The priority of this feature is high. It is necessary for a user to login to access the system.

4.1.2 Stimulus/Response Sequences

- The user adds his credentials on login page
- The user clicks login button in order to access
- The system will then check the validity of user's credentials
- If the credentials are valid the user will allow access to the user

4.1.3 Functional Requirements

Req-1: The system must allow the user to enter his/her login details.

Req-2: The system must check the validity of the user's credentials when the login button is clicked.

Req-3: The system must validate the user's credentials before allowing access.

Req-4:The system must allow access to the user if their credentials are valid.

Req-5: The system must allow the user to reset their password by clicking the 'Forgot Password?' option.

4.2 Sign Up

4.2.1 Description and Priority

A new user has to sign up in order to create an account and then access the application. The priority of this feature is high.

4.2.2 Stimulus/Response Sequences

- A new user adds his information on the sign-up page.
- The user clicks the sign up button.
- The system will add the user's data to the database.
- The user will be then allowed to access the application

4.2.3 Functional Requirements

Req-1: The system must allow a new user to add his/her information details

Req-2: The system must create an account of the user when the sign up button is clicked.

Req-3: The system must store the data of the user to the database.

Req-4: The system must allow access to the user after the account has been created.

4.3 Set and Edit Budget

4.3.1 Description and Priority

The user enters his budget for the month or for specific products. The user can also later edit his budget if he wants to. The priority of this feature is high

4.3.2 Stimulus/Response Sequences

- The user enters an amount for the budget.
- The user then clicks the set budget button.
- To edit the budget the user will click the Edit budget button.
- The user then enters a new budget.
- The system will allocate the budget.

4.3.3 Functional Requirements

Req-1: The system must allow users to add a budget.

Req-2: The system must allow users to edit the budget.

Req-3: The system must check that the value entered is a numeric value.

4.4 Search and View Product

4.4.1 Description and Priority

The user can search a product of his choice or see the whole inventory. The type of product user searches, the application will then display similar products. The priority of this product is high

4.4.2 Stimulus/Response Sequences

- The user enters a product name or type in search bar
- The system checks for the product in the inventory
- The system would then display the product to the user
- The user can then select the product he/she wants

4.4.3 Functional Requirements

Req-1: The system must allow users to search for a product.

Req-2: The system must provide browsing options to see product details

Req-3: The system must allow the user to select a product.

Req-4: The system must display detailed product information to the user.

4.5 Give Expenditure Suggestions

4.5.1 Description and Priority

The system will analyze the user expenses and in addition to this, it will suggest improvements for making cheaper purchases. The priority of this feature is high.

4.5.2 Stimulus/Response Sequences

- The user can select the category for which it requires suggestions
- The system will analyze the monthly expenses of the user based on their budget.
- The system will then compare each product with its relevant alternative which falls under budget.
- The system will then prepare a report for the user suggesting alternatives with lesser price.
- The user will get this report in the Get Report tab.

4.5.3 Functional Requirements

Req-1: The system must allow the user to set filters to input any specific category they want suggestions for.

Req-2: The system must analyze the monthly expenditure of the user to suggest improvements.

Req-3: The system must provide users with a report for improving their budget management.

Req-4: The system must allow the user to access the report in the Get Report tab.

4.6 Provide Monthly Reports

4.6.1 Description and Priority

The system will provide the user with details of his expenses throughout the month. The system will represent the data in forms of tables,graphs and charts. The priority of this feature is high.

4.6.2 Stimulus/Response Sequences

- The user will click on Get Report tab for monthly reports
- The system will display the tables,charts and graphs based on the user expenditure throughout the month
- The user then can analyze where he/she requires improvements and could look at previously bought products as well.
- The user can also get separate reports for different categories.

4.6.3 Functional Requirements

Req-1: The system must analyze the user's monthly data and make reports.

Req-2: The system must display reports in tabular format, graphs and bar chart

Req-3: The system must provide users with the facility to get separate reports for each category.

4.7 Allow Online Product Rating and Reviews

4.7.1 Description and Priority

The user can view ratings and reviews of the products they want to purchase. Moreover, the user can also add his/her own reviews and ratings for a product they have purchased before. The priority of this feature is medium.

4.7.2 Stimulus/Response Sequences

- The user will click on the product to view details
- The system will display the product's details to the user.
- The user can then view ratings and reviews of the product.

4.7.3 Functional Requirements

Req-1: The system must display reviews and ratings of the product he/she searches,

Req-2: The system must allow their reviews and ratings for a product.

4.8 Add Transactions and Assign Points

4.8.1 Description and Priority

The system adds the product selected by the user in his transaction record to keep record of user's expenditure. The user will select the product which he purchased and the system will add the record to the transactions. On every transaction the system assigns some reward points to the user. The priority of this feature is high.

4.8.2 Stimulus/Response Sequences

- The user will click on the product to select the product he purchased in order to keep track of his/her purchases.
- Once the user clicks on the product, the system will add the record to the transaction record system.
- The system will then assign reward points to the user on the basis of his purchase.

4.8.3 Functional Requirements

Req-1: The system must allow the user to select the product he wants to purchase.

Req-2: The system must add the product user selected to the transaction record.

Req-3: The system must assign reward points to the user on his/her every transaction.

4.9 Give Warnings to User

4.9.1 Description and Priority

The system will give warning to the user by raising an alarm every time the users exceed their budget in order to notify them. The priority of this feature is high.

4.9.2 Stimulus/Response Sequences

- User selects the product that he wants to purchase and the system keeps track of the budget.
- When the user exceeds the budget,the system detects it and raises an alarm to notify the user
- The user will then act accordingly and might not select the product in order to stay on budget.

4.9.3 Functional Requirements

Req-1: The system must raise an alarm for 5 seconds every time the user exceeds his budget limit.

4.10 Allow User to Redeem Reward Points

4.10.1 Description and Priority

The user can redeem reward points at any supermarket by scanning the barcode. The user can get discounts on certain items through these reward points.

4.10.2 Stimulus/Response Sequences

- User scans the barcode through a scanner in a supermarket.
- The system then gives a discount percentage to users on their purchases.
- The discount offered by app are then applicable to their purchases

4.10.3 Functional Requirements

Req-1: The system must allow users to scan the barcode for redeeming points.

Req-2: The system must give users a discount value for their purchases.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

1. The system shall allow the user to log in within 10 seconds of pressing the login button.
2. The system shall compare the entered login credentials with the user record, and return a flag telling whether or not they are valid.
3. The system shall open the sign up form within 10 seconds of the user clicking the sign up button.c
4. The system shall check whether the user already exists by comparing the email address entered in sign up form with the user record.
5. The system shall register a user within 20 seconds of their clicking the sign up button.
6. The system shall redirect a new user to the homepage within 10 seconds of their being registered.
7. The system shall save the budget in the Budget Record within 15 seconds of the user pressing the Add Budget button.
8. The system shall retrieve product suggestions within 20 seconds of the search button being pressed 80% of the time.
9. The system shall be able to deal with 20 search requests at a time.
10. The system shall display the details of the selected product within 5 seconds of the user clicking on it.
11. The system shall update the user's Transaction Record within 20 seconds of the user selecting a product.
12. The system shall allow the user to rate a product they have selected, and update the Rating Record within 10 seconds of the rating input.
13. The system shall update user's reward points within 60 seconds of a transaction
14. The system shall generate a monthly report for the previous month at 1 a.m. on the first day of a month.
15. The system shall allow a user to access their monthly expense report, and expenses suggestion report in the Get Report tab.
16. The system shall generate a warning notification within 60 seconds of a user exceeding their budget.

5.2 Safety Requirements

1. The system shall refuse access to unauthorized individuals.
2. The system shall protect the privacy of the users by not revealing their personal information or passwords at any time.
3. The system shall automatically log out if the user appears to be away.

5.3 Security Requirements

1. The system shall allow access to a user account only after the login credentials have been verified.
2. The password shall not be visible at the time of login.
3. The system shall disallow login for the next 30 minutes after 5 incorrect login attempts.
4. The user shall be able to reset their password through their email.
5. The user shall be signed out automatically if their account is idle for 15 minutes.
6. The user shall be automatically signed out when the browser window is closed.
7. The system shall require the user to enter their password before redeeming reward points.

5.4 Software Quality Attributes

1. The system shall have a maintenance down time on the 15th day of every month, in order to fix detected bugs and add any new features.
2. The system shall have a maximum maintenance down time of 3 hours, between 1 and 4 am, so as to disturb as few users as possible.
3. The system shall be backed every 10 days, so as to prevent data loss in case of any unforeseen failure.
4. The system shall store its backup copies at multiple locations.
5. The user shall not require any additional training to use the system, apart from ability for basic web browsing.
6. The system shall have easy-to-navigate user interface, self-explanatory titles for tabs, and helpful icons for features, making it easy-to-operate for the user.
7. The system shall display alert prompts before major changes, like editing budget, making a transaction, and redeeming reward points, so as to make it difficult for a user to make unintended mistakes.
8. In the future, the system shall be adapted for mobile applications over time, and will be compatible with Android and iOS.
9. In the future, the system shall introduce a Contact feature, allowing users to communicate their complaints and suggestions.
10. In the future, the system shall be available in Urdu language as well.

5.5 Business Rules

1. Only a valid email address, which a user has access to, will be registered,
2. The user will be informed when they exceed their budget.
3. The user will receive assistance in finding everyday products they can afford.
4. The user will be guided as to how to reduce their expenses.

5. The user shall be rewarded for keeping within their budget.

6. Other Requirements

6.1 Legal Requirements:

1. The product does not violate any existing patent rights.
2. The product does not have conflict with any other products.
3. The product distributor possesses the rights to distribute this product and its associated documentation.

Appendix A: Glossary

- SRS: Software Requirements Specification –

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Name of our software

- GUI: Graphical User Interface –

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on World Wide Web pages

- JavaScript:

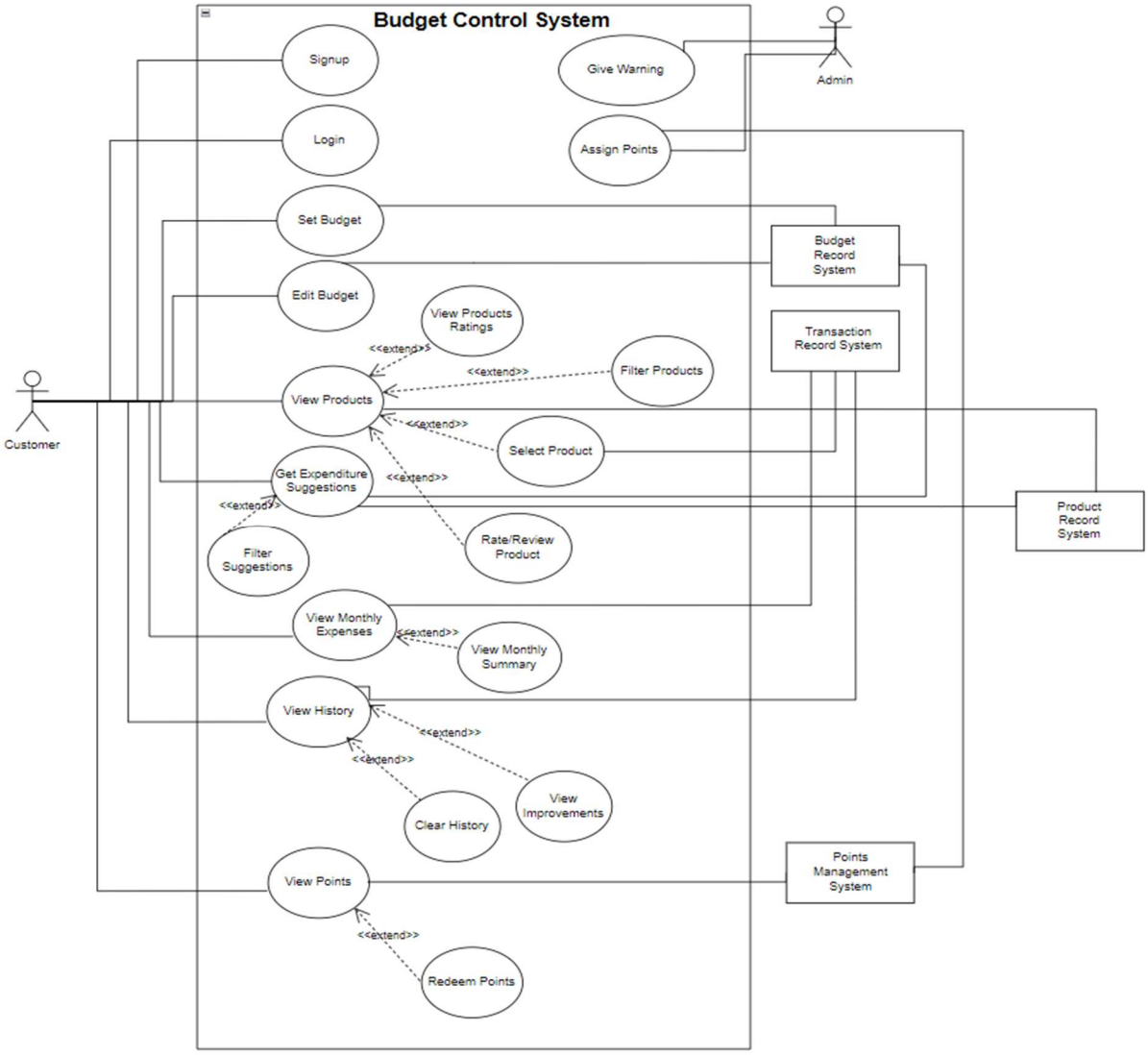
A scripting language that enables you to create dynamically updating content

- CSS: Cascading Style Sheets –

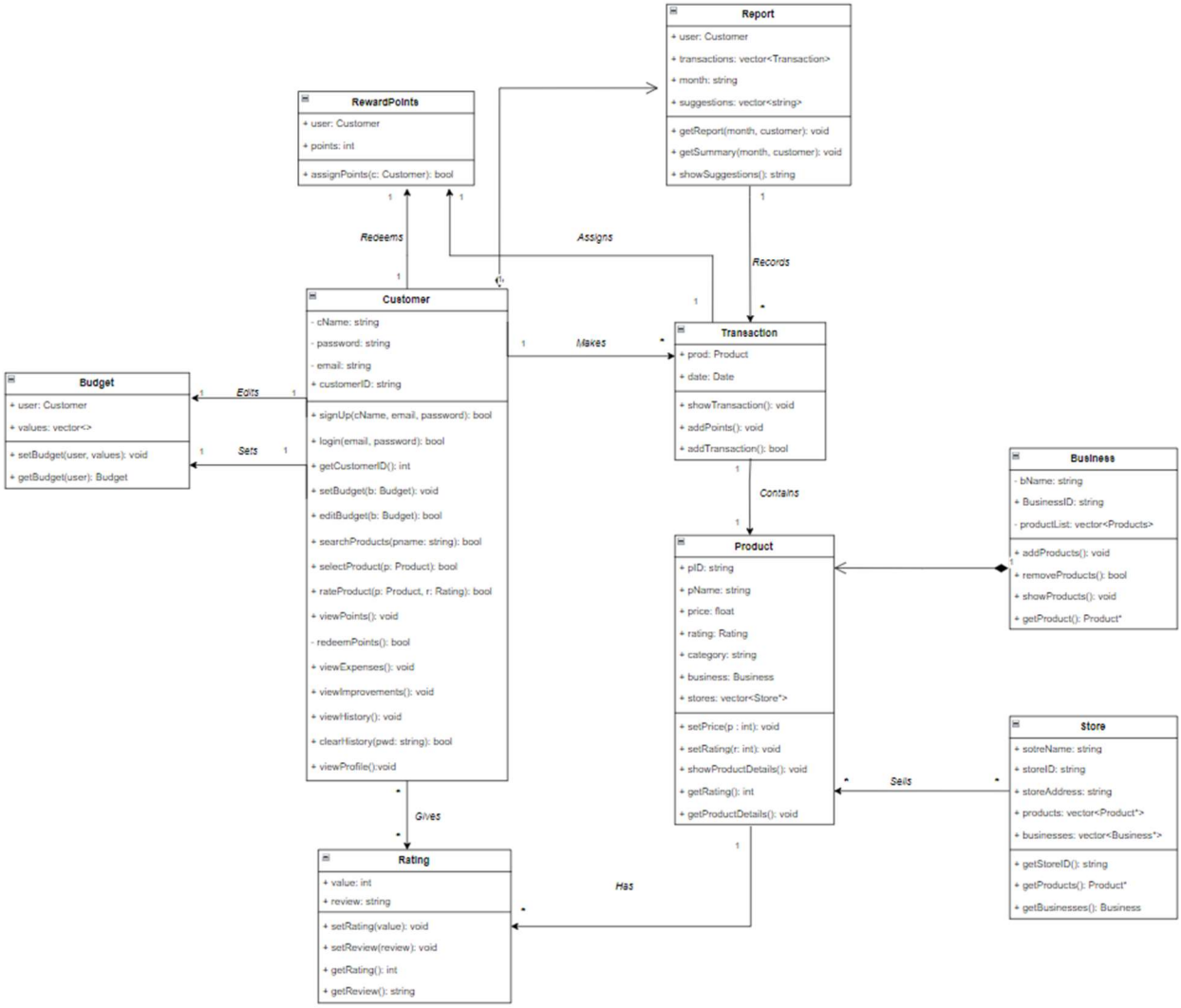
Describes how HTML elements are displayed on screen

Appendix B: Analysis Models

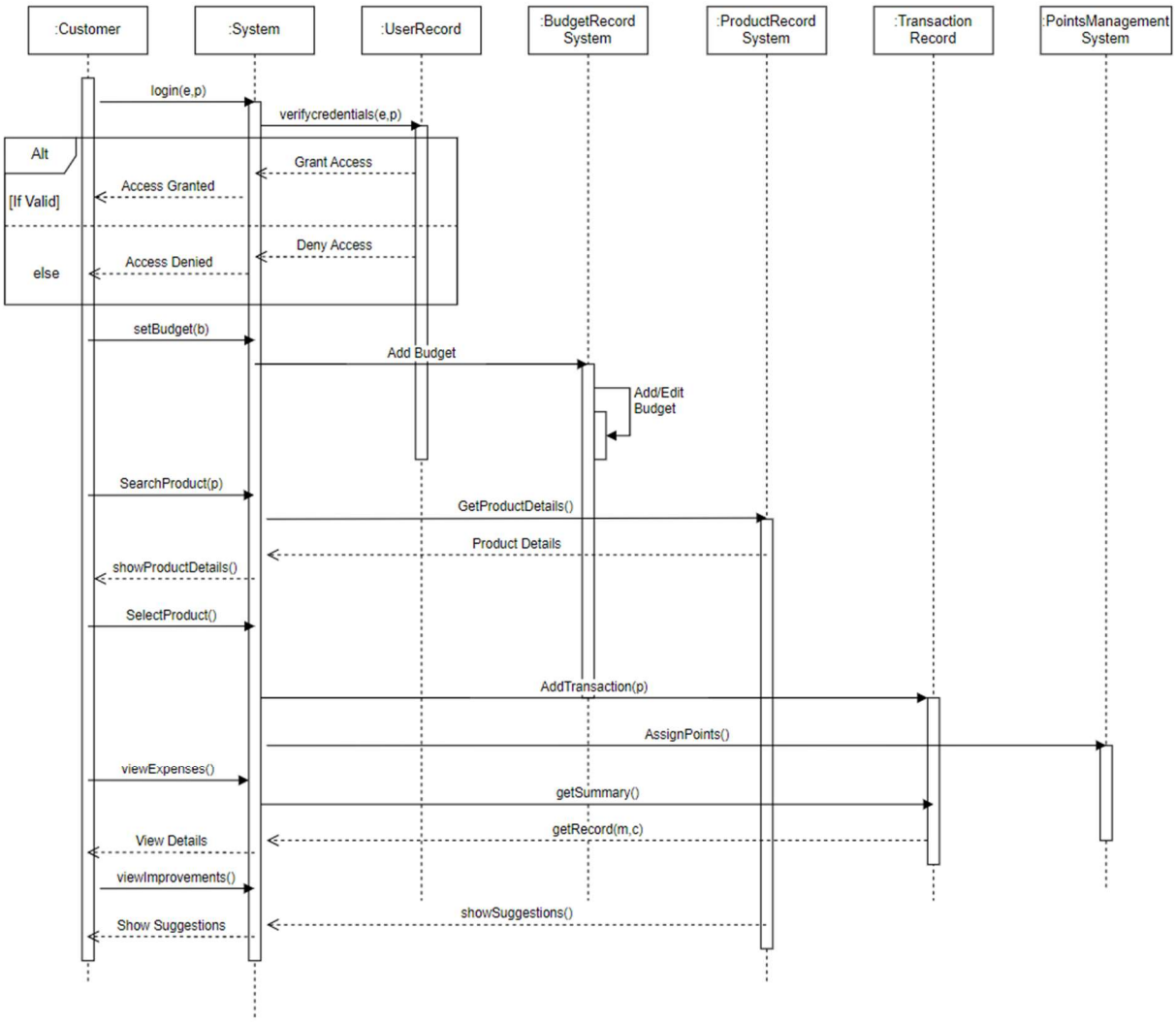
B.1. Use Case Diagram



B.2. Class Diagram

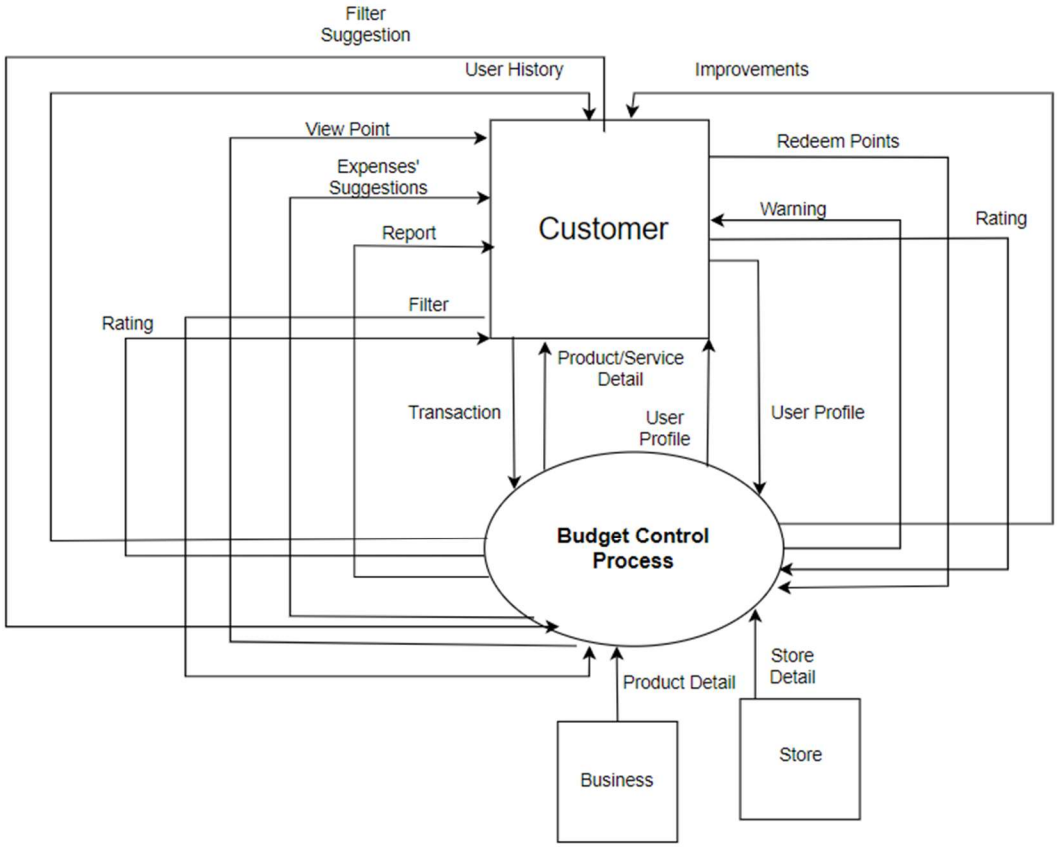


B.3. Sequence Diagram

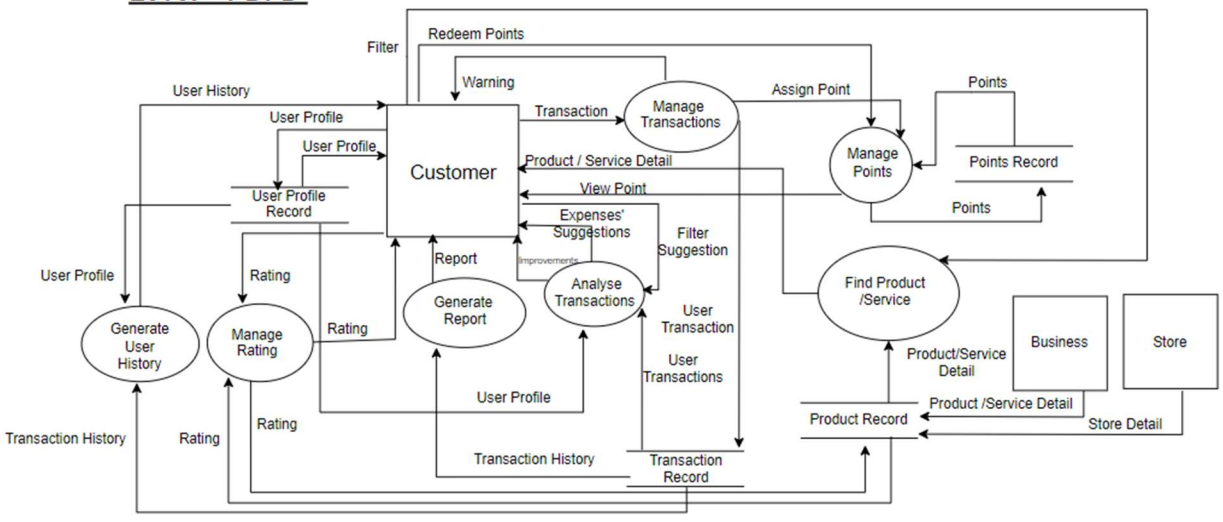


B.4. Data Flow Diagrams

Level - 0 DFD



Level - 1 DFD



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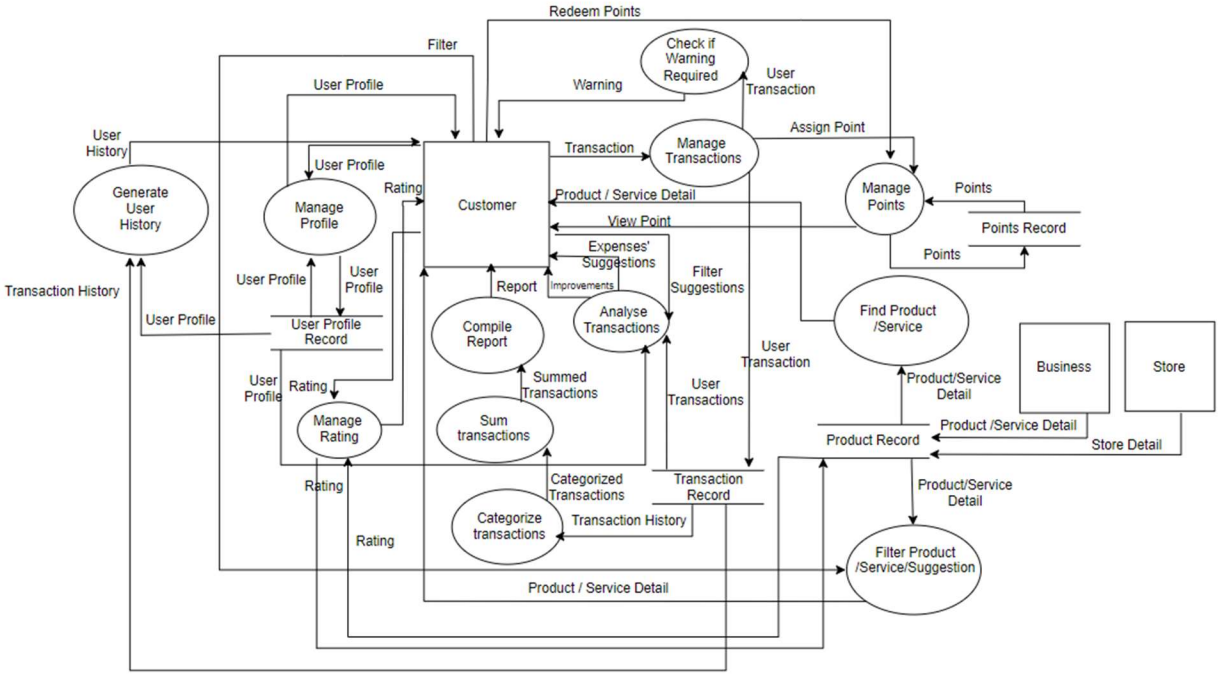
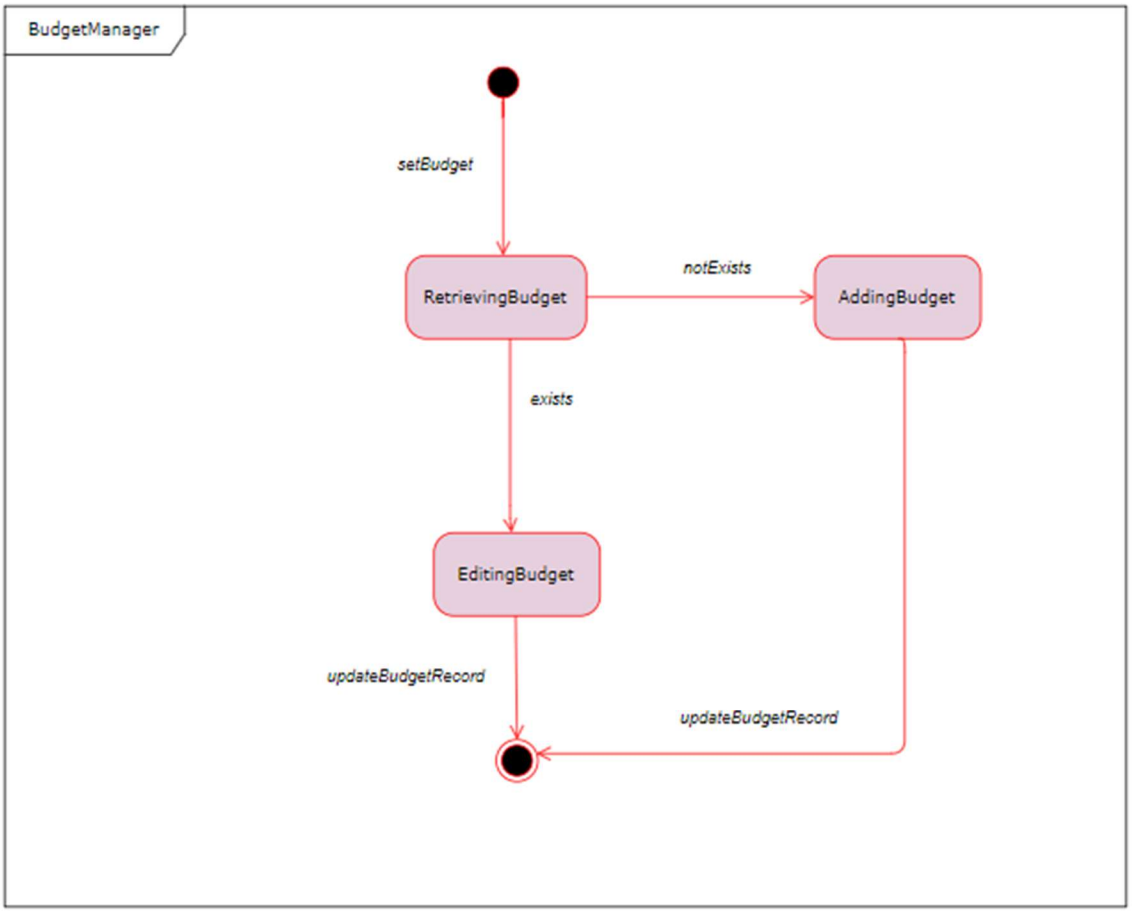
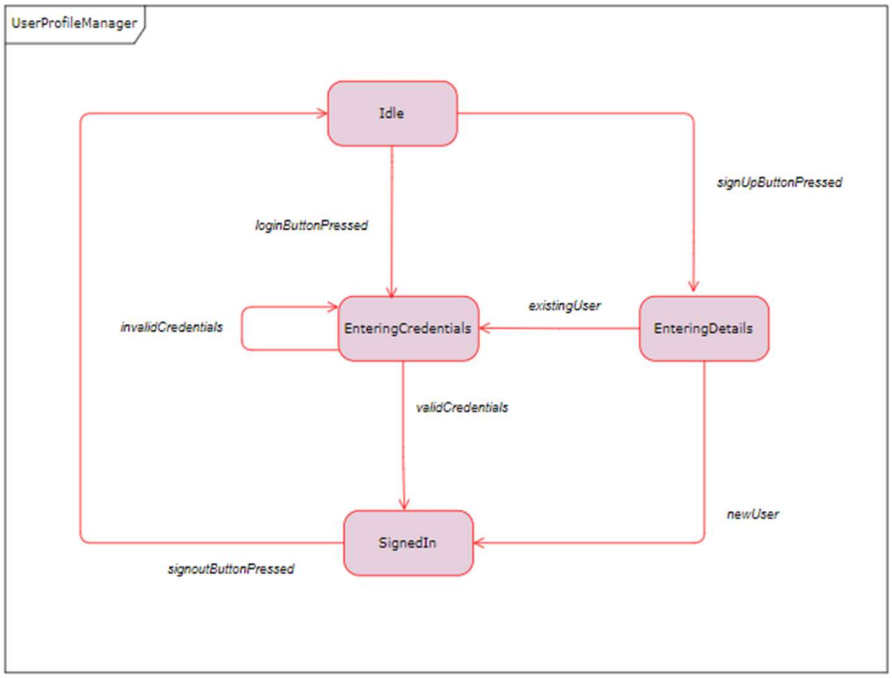

Redeem Points
Filter
Check if Warning Required
User Transaction
User Profile
Warning
User History
Transaction
Manage Transactions
Assign Point
User Profile
Rating
Customer
Product / Service Detail
Manage Points
Points
Generate User History
Manage Profile
View Point
Points Record
Expenses' Suggestions
Points
Transaction History
User Profile
User Profile
Report
Improvements
Filter Suggestions
User Profile
User Profile Record
Compile Report
Analyse Transactions
Find Product /Service
Business
Store
User Transaction
User Profile
Rating
Summed Transactions
User Transactions
Product/Service Detail
Manage Rating
Sum transactions
Product /Service Detail
Product Record
Store Detail
Rating
Categorized Transactions
Transaction Record
Product/Service Detail
Categorize transactions
Transaction History
Rating
Filter Product /Service/Suggestion
Product / Service Detail

B.5. State Diagrams

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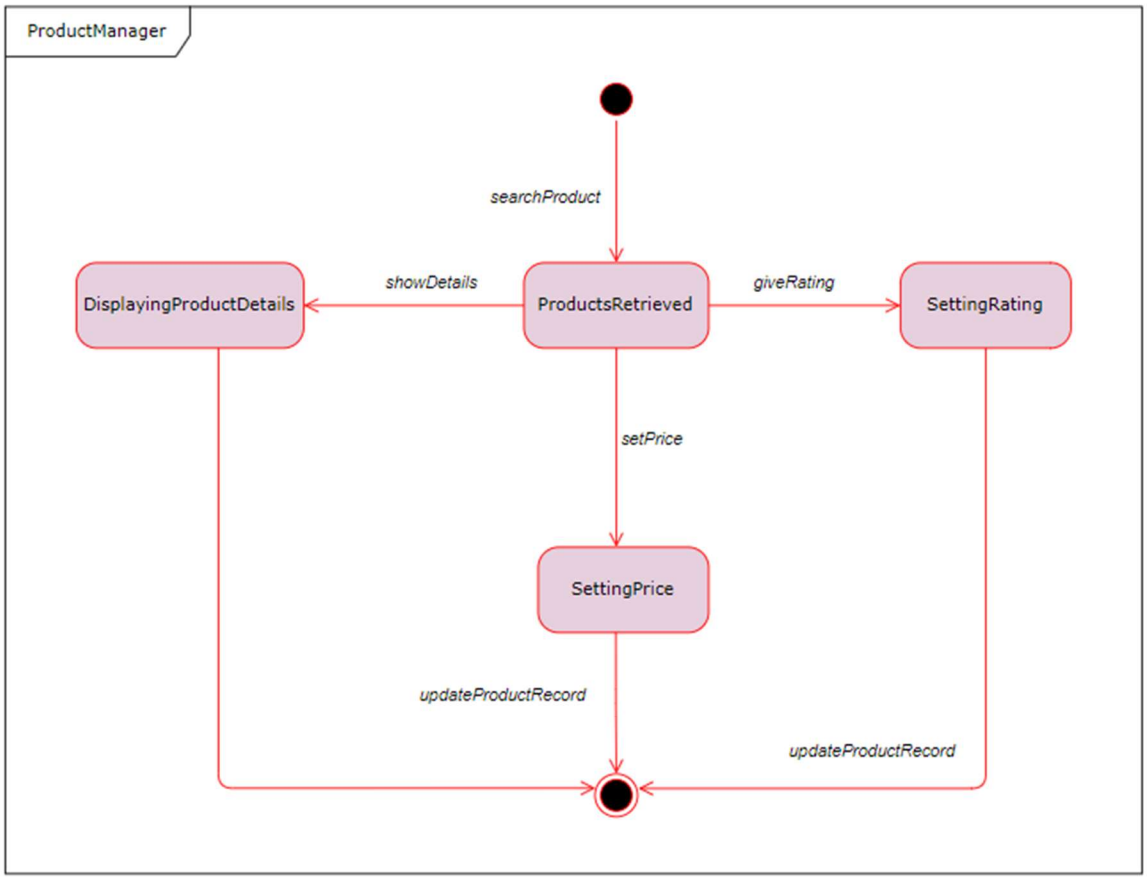
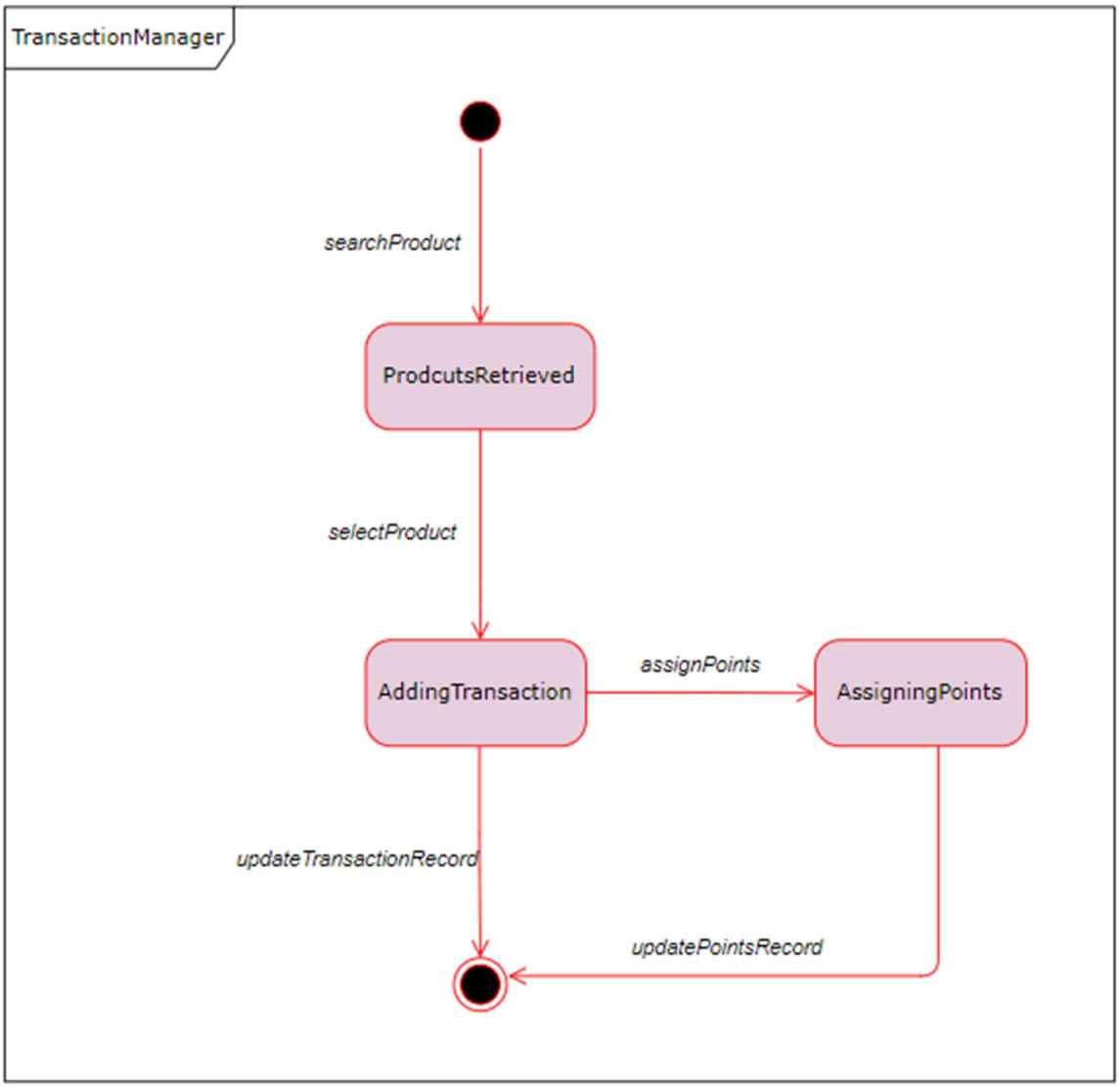
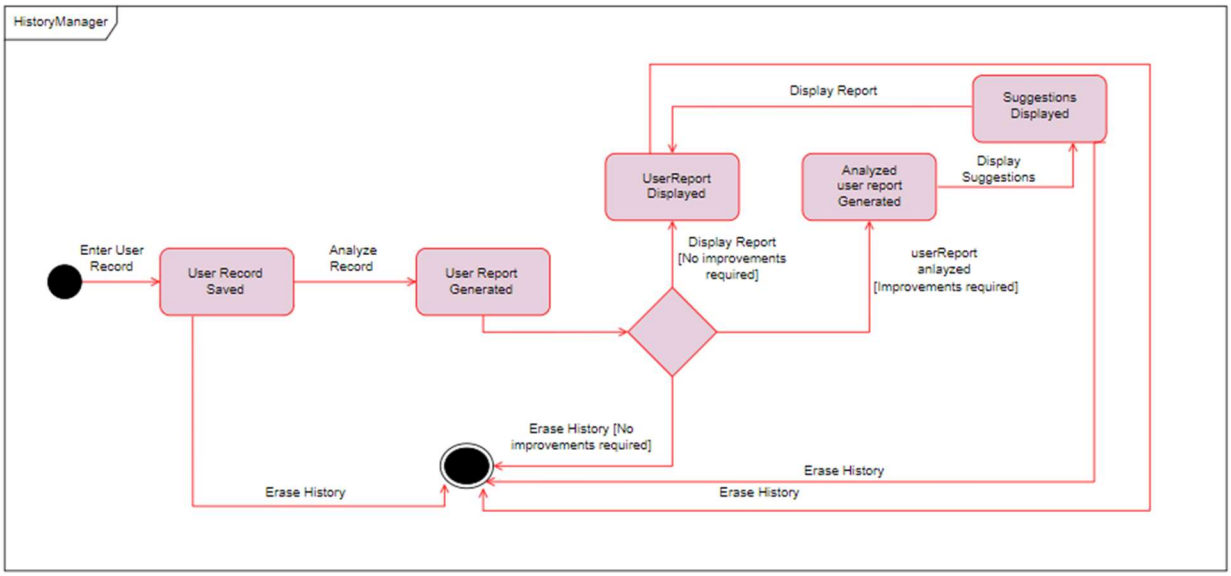
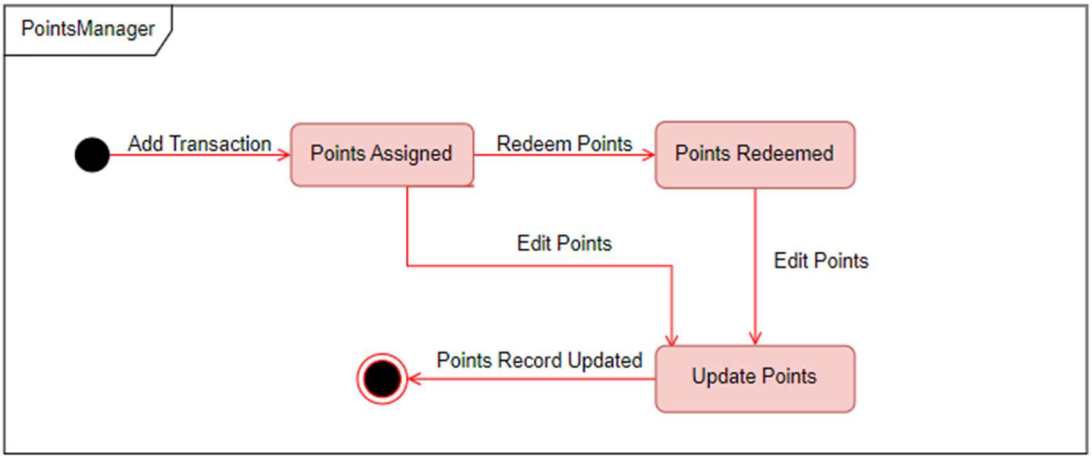
loginButtonPressed
invalidCredentials
EnteringCredentials
existingUser
EnteringDetails
validCredentials
newUser
SignedIn
signoutButtonPressed


ProductManager
searchProduct
DisplayingProductDetails
showDetails
ProductsRetrieved
giveRating
SettingRating
setPrice
SettingPrice
updateProductRecord
updateProductRecord


TransactionManager
searchProduct
ProdcutsRetrieved
selectProduct
AddingTransaction
assignPoints
AssigningPoints
updateTransactionRecord
updatePointsRecord


HistoryManager
Display Report
Suggestions Displayed
UserReport Displayed
Analyzed user report Generated
Display Suggestions
Enter User Record
User Record Saved
Analyze Record
User Report Generated
Display Report [No improvements required]
userReport anlayzed [Improvements required]
Erase History [No improvements required]
Erase History
Erase History
Erase History


PointsManager
Add Transaction
Points Assigned
Redeem Points
Points Redeemed
Edit Points
Edit Points
Points Record Updated
Update Points

Appendix C: To Be Determined List