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**COMSATS University, Islamabad Pakistan**

Assignment-06

Project Final Report

For

**AI-Driven Customer Experience Management (CEM) Platform**

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Bachelor of Science in Software Engineering (2023-2027)

**The candidate confirms that the work submitted is their own and appropriate  
 credit has been given where reference has been made to the work of others**.

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**COMSATS University, Islamabad Pakistan**

**AI-Driven Customer Experience Management (CEM) Platform**

**A project presented to**

**COMSATS University, Islamabad**

**In partial fulfillment**

**of the requirement for the degree of**

Bachelor of Science in Software Engineering (2023-2027)

**By**

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**Executive Summary**

The "AI-Driven Customer Experience Management (CEM) Platform" is an innovative solution designed to enhance customer interactions across multiple digital channels using cutting-edge Artificial Intelligence (AI) and Virtual Reality (VR) technologies. The platform addresses key challenges such as managing complex multi-channel interactions, analyzing customer sentiments in real-time, and delivering personalized recommendations. Its modular design includes essential features like customer interaction analysis, sentiment engine analysis, personalization, loyalty program management, and performance metrics dashboards.

A standout feature of the platform is its integration of VR, enabling immersive training environments for customer service teams to simulate real-world scenarios and improve their responsiveness. AI tools power advanced analytics, offering actionable insights, predictive personalization, and sentiment classification, while ensuring data security and compliance with privacy regulations.

By providing businesses with scalable, data-driven solutions, the platform fosters customer loyalty, enhances engagement, and drives long-term success. Its flexibility and robust capabilities position it as avital tool for organizations looking to gain a competitive edge in today’s digital marketplace.

**Acknowledgement**

All praise is to Almighty Allah who bestowed upon us a minute portion of His boundless knowledge by virtue of which we were able to accomplish this challenging task.

We are greatly indebted to our project supervisor “Mr. Tehseen Riaz Abbasi”. Without their personal supervision, advice and valuable guidance, completion of this project would have been doubtful. We are deeply indebted to them for their encouragement and continual help during this work.

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Rai Sardar Ahmed Alisha Ejaz

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**Abbreviations**

|  |  |
| --- | --- |
| **SRS** | Software Requirements Specification |
| **SDS** | Software Design Specification |
| **STP** | Software Testing Protocol |
| **UC** | Use Case |
| **TC** | Test Case |
| **N/A** | Not Applicable |
| **AI** | Artificial Intelligence |
| **ST** | Software Testing |
| **UC** | Use Case |
| **NLP** | Natural Language Processing |
| **VR** | Virtual Reality |

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## Project Major Category:

* **A-**Web Application/Web Application based Information System

 **B-**Smartphone Application

 **J-** Virtual Reality

# Introduction

The purpose of this project document is to provide a clear description of the AI-Driven Customer Experience Management (CEM) Platform. This platform is designed to enhance customer experiences by leveraging Artificial Intelligence (AI) tools and Virtual Reality (VR) to train customer service teams and provide actionable insights for businesses.

## Brief

Traditional customer service systems have a limited ability to extract meaningful insights from customer interactions, leading to missed opportunities for improvement. The AI-Driven CEM Platform addresses these challenges by tracking customer interactions across various platforms such as emails, social media, chatbots, and surveys. It identifies pain points, maps customer journeys, and analyzes customer interests to enhance service quality and foster customer loyalty. The system uses a large customer database to extract useful information, enabling businesses to make data-driven decisions for better outcomes.

## Project Background

Customer interaction has evolved significantly over the years with the advent of multiple communication channels. However, the use of chatbots and automated services has made managing customer experiences more complex. The AI-Driven CEM Platform uses advanced AI tools to improve response times, provide valuable insights, and generate metrics for sentiment analysis and recommendations. By fostering stronger connections with customers, the platform helps businesses achieve long-term success and gain a competitive edge in the market.

## Related System Analysis/Literature Review

Table-1: Related System Analysis with Targeted Project Solution.

|  |  |  |
| --- | --- | --- |
| **Application name** | **Weaknesses** | **Proposed Project Solution** |
| Zendesk png images | PNGWing  zendsek.com  https://www.zendesk.com/?variant=481 | * Lack AI driven based for proactive support. * Lack response time. * No journey map. | * Implement AI chatbots for customer support. * AI will play role to reduce response time. * Proposed system will generate a journey map. |
| HubSpot Logo History, Symbol, Meaning And EvolutionHubSpot Service Hub  **https://www.hubspot.com** | * Sophisticated AI with no support customer for predictive analyzing * No VR integration. * No customer journey map. | * Direct AI support for analyzing patterns from customer data to make decisions. * VR to experience customer interaction. * Will have a customer journey map. |
| Service_Cloud  Salesforce Service Cloud  https://www.salesforce.com | * High Cost * Slow response time. * Lack of advanced sentiment Analysis | * AI tool will help analyses to suggest cost effective plans. * AI chatbots will help responding in time to customers regarding queries. * It will use AI for analysis of customer data |

## Advantages/Benefits of Proposed System

Following are the advantages to the solutions provided for existing problems:

1. It would better analyze customer interaction across different platforms.
2. Proposed system would have better response type due to use of AI tools.
3. Virtual environment will help customer team to practice interaction with customer.
4. It will produce a customer journey map through which business can analyze by which platform customer interacted with their product or services.
5. It will automatically help giving recommendations to customers regarding their interest.
6. It fosters business to build connection with customers to succeed in long term and have an advantage over other competitors.
7. The large database of customer help in decision making.

## Project Scope

The scope of this project document is to enhance customer interaction across multiple platforms. The primary focus of this platform is to leverage artificial intelligence and virtual reality to better analyze data and interactions. It has boundaries of digital interaction only. It will not handle non digital interaction. The core of platform is AI driven analytics, natural language processing and virtual reality. The key functionalities include customer interaction analytics from digital platforms and sentimental analysis that utilizes Natural language processing (NLP) to evaluate customer sentiments and behavior.

Additionally, proposed system will feature Personalization Engine that delivered tailored experiences based on their preferences and interaction history. This highlights the area where attention is needed, and customers are not satisfied with product that need to be addressed. The project prioritizes security of customer data to protect sensitive information and ensure smooth operations on data. This platform will be flexible and focus on solutions that can be accessed through the web application and mobile phones.

This CEM is designed to be scalable, suitable for large and small business to handle their customer services.

**Context Diagram**

A diagram of a company

Description automatically generated

**Figure 1: Context Diagram of the AI-Driven CEM Platform**

## Modules

Both Web and Mobile App will be able to operate under all these Modules effectively. These modules will provide better interaction with customers to be able to perform well under these modules.

## Module 1: Customer Interaction Analysis

To gather and analyze data of customers from different platforms.

FE-1: Collect data from emails, chatbots, social media and surveys.

FE-2: Analyze data that is coming from different platforms.

FE-3: Segment data for targeted strategies.

FE-4: Track behavior of customers regarding provided services.

FE-5: Data Analysis helping recommendations of products and services on platform.

FE-6: Large data of customers for decision making and long-term use.

FE-7: Identify opportunities for improving communication and customer engagement.

FE-8: Generate reports over customer interactions.

## Module 2: Sentiment Engine Analysis

It helps organizations process the sentiments from interaction using Natural language processing.

FE-1: Analyze feedback from various channels.

FE-2: Track sentiments over time to better understand the behavior.

FE-3: Customer sentiment to be classified as positive, negative or neutral.

FE-4: Highlight critical feedback that need attention.

FE-5 By analyzing negative comments give recommendations.

FE-6: Integrating sentiments with AI tools.

FE-7: Generate sentimental report for review from organization for decision making.

## Module 3: Personalization

The tools provide better experience for customers.

FE-1: Real time analysis on customer data.

FE-2: Recommend products or services based on individual customer data.

FE-3: Provide guidance to scanned items through the navigation system.

FE-4: Offer personalized offers to customers based on customer history.

FE-5: Predict customer needs using AI tool by algorithms.

FE-6: Customer can also set their interest to organization for better experience.

## Module 4: Performance Metrics Dashboard:

To track the performance and interaction by the metrices that are showing on dashboard.

FE-1: Presentation of KPIs related to customer satisfaction.

FE-2: It helps to identify areas where improvement is needed.

FE-3: Offer suggestion for better experience to make customer satisfy.

FE-4: Performance shown through graphs that are interactive.

FE-5: Monitor metrices to understand what customers are at churn stage.

FE-6: Generate reports for organization to analyze and make decisions.

## Module 5: User Profile

Users will be able to sign-up and make their profiles to access information easily every time they use the app.

FE-1: Register in the system and perform sign in and identity authentication of organization.

FE-2: Create, manage and update profile.

FE-3: Search history, previously saved items and marked activities.

FE-4: Enable relevant notifications for updates, news and deals etc.

FE-5: Manage privacy by providing or restricting access to some details.

FE-6: Share or link other social platforms.

## Module 6: Customer Journey Map

Users will be able to interact with the website to facilities with map

FE-1: Allow organizations to create a visual representation of customer interaction.

FE-2: Analyzing behavior of customer at every stage.

FE-3: Identifying touchpoints of customers.

FE-4: Provide suggestions by viewing journey map.

FE-5: Track metrics like engagement time, conversion rates and drop offs.

FE-6: Identifying trends through journey maps

FE-7: Generate reports on journey trends for improvement.

## Module 7: Loyalty and Reward Program Modules

It will reward the loyal customers by tracking interactions.

FE-1: Create loyalty programs for their customers.

FE-2: Reward point on basis of customer interaction.

FE-3 Notify customers on their loyalty status.

FE-4: Integrate loyalty with customers engagement.

FE-5: Personalized offers for loyal customers that interacted most with business.

FE-6: Generate report on effectiveness of loyalty program.

## Module 8: Pricing and Subscription

It will reward the loyal customers by tracking interactions.

FE-1: VR subscription tailored customer engagement.

FE-2: 24/7 support for customer team for VR environment.

FE-3 Notify loyal customers with special discounts.

FE-4: Experience VR to analyze according to customer needs

FE-5:. Display real time data within VR environment.

## System Limitations/Constraints

LI-1: Too much personalized content does raise ethical and trust issues in clients/users and gives the feeling of being stalked where the customer may feel uncomfortable with how much the system knows about them.

 LI-2: AI (NLP) might not be able to fully interpret the customer’s sentiment and emotions like when the customer is being sarcastic or ambiguous potentially leading to recommendations that are not appropriate.

LI-3: VR training can be costly and may not be accessible to all customers services representatives. Furthermore, some agents while training can also face VR (motion) sickness.

LI-4: The accuracy of this AI driven system depends on accurate and well-labelled data collected from vast resources like emails, social media and chatbots etc. Any discrepancy in the dataset collected will potentially lead to inaccurate analysis of customer’s sentiment. Also, for collecting this vast amount of data, the system needs to strictly comply with privacy regulations.

LI-5: AI and VR should not completely take human touch out of the picture i.e. human intervention will still be required while dealing with complex emotional issues.

## Tools and Technologies

Table 2: Tools and Technologies for the AI-Driven CEM Platform

|  |  |  |  |
| --- | --- | --- | --- |
| **Tools and**  **Technologies** | **Tools** | **Version** | **Rationale** |
| Visual Studio Code | 1.75 | IDE |
| MongoDB | 5.0 | DBMS |
| Firebase | 9.12.1 | Design Work |
| Postman | 9.3.0 | AR SDK |
| Jira | 9.12 | Project Management |
| MS Word | 365 | Documentation |
| MS Visio | 2013 | Diagram Creation |
| Figma | 1.7 | Mockups Creation |
| **Technology** | **Version** | **Rationale** |
| Python | 3.9.0 | Programming language |
| JavaScript | 2.2.0 | Programming language |
| Node.js | 14.17.4 | Backend runtime environment |
| Express.js | 4.17.3 | Framework |
| TensorFlow | 2.7.0 | Machine Learning Library |
| OpenCV | 4.3.0 | Library |
| Twilio API | 1.0.0 | API for SMS and phone-based customer interaction management |
| IBM Watson API | 4.0.0 | NLP API |

## Relevance to Course Modules

A brief explanation of how your project is related to various courses studied during BCS.

## Design and Process Methodology for This Project

**Software Process Model:**

***Incremental Software Process model.***

The reason is that this approach will allow us to adjust and refine the system after each increment. Also, this model provides us with greater flexibility, and AI and VR technology is also evolving with time, so adaptability and flexibility are crucial. We will be able to construct the (better) system with each increment and tweak and enhance functionality based on user feedback after each iteration. Following this model will allow us to test and validate each increment early in the development process and fix those bugs before the final deployment.

**Software Design Methodology:**

***Object-Oriented Methodology.***

The reason for using object-oriented design is as our system relies on large and complex datasets and will also require code reusability. OOP is often recommended for larger systems requiring maintainability and scalability. OOP can model real-life entities as objects and each object with its own attributes (data members) and behavior (data Functions). Encapsulation and inheritance are some of the core object-oriented concepts that will allow us to build a modular design that encourages code reuse and maintainability. Furthermore, complex systems like AI-driven CEM require flexibility which procedural does not provide.

## Team Members Individual Tasks/Work Division

Table 3: Team Member Work Division the Targeted Project.

|  |  |  |
| --- | --- | --- |
| **Student Name** | **Student Registration Number** | **Responsibility/ Module / Feature** |
| Rai Sardar Ahmed | FA23-BSE-120 | Back-end, Front-end   (Module 8.1, 8.2, 8.5, 8.6)  Sentiment Analysis & Customer journey map |
| Alisha Ejaz | FA23-BSE-122 | Front-end, Back-end   (Module 8.3, 8.4, 8.7,8.8)  Rewards, Loyalty Program, Pricing and Metrics Dashboard |

# Problem Definition

This chapter discusses the precise problem to be solved. It should extend to include the outcome.



## Problem Statement

The development of Customer Experience Management (CEM) platform is driving by growing complexity because of customer interaction across different channels. They lack real time response to customer interactions. It’s problem for businesses to find cause of dissatisfaction.

* **MANAGE INTERACTIONS ACROSS MULTIPLE CHANNELS:** Complexity in getting data due to interactions across different channels such as email, chatbots, social media, and surveys. Businesses nowadays struggles to manage customer interactions that is along multiple platforms.
* **LACK REAL-TIME ANALYSES:** Existing system lack real time analysis and insights. Inability to personalize responses according to customer sentiment and interactions.

**PROBLEM IN IDENTIFYING ROOT CAUSE:** Businesses faced problem in identifying root cause of customer dissatisfaction due to poor data analysis.

## Problem Solution for the Proposed System

Solution is to use Artificial intelligence for sentimental analysis across various channels. By understanding feedback is positive, negative, or neutral for analysis.AI help to make customer journey map by tracking their touch points. AI chatbot also handle common inquires for customer assistance.AI will give the personalized experience by analyzing data to recommend products or services according to their interest, also help to proactively address issues that customers are facing. It will help to identify customers that are on the stage of retention. It will play a significant role in assuring high level of service quality.

Use of Virtual reality for training and improvement of customer service team in virtual environment. Virtual let the business create a customer environment. Testing different scenarios like customer problems or requests for how to engage with customers and how to satisfy customers. VR will be safe environment where agent can practice how to respond to customers where they can see AI stimulated customers without real consequences. They can see and hear AI stimulated customers and need to talk, type their responses just like they are giving an actual response. So AI and VR are two advanced technologies that are going to be used for this platform to help business grow faster by satisfying their customers and also a realistic way than traditional methods for engaging customers.

## Deliverables and Development Requirements

The project deliverables include:

1. **AI-Driven CEM Platform**: A functional system with modules for customer interaction analysis, sentiment analysis, personalization, loyalty management, and performance dashboards.
2. **User Interfaces**: Intuitive web and mobile application interfaces for customers, administrators, and customer service teams.
3. **APIs and Integrations**: Fully documented APIs to support platform functionalities, including communication, analytics, and payment processing.
4. **VR Training Environment**: Immersive VR scenarios for training customer service representatives.
5. **Reports and Dashboards**: Comprehensive data visualization tools to monitor customer metrics, churn rates, and performance insights.
6. **Documentation**: Complete technical documentation, including software requirements specifications, use case descriptions, user manuals, and system architecture diagrams.
7. **Testing Artifacts**: Test cases, testing reports, and validation outcomes to ensure system reliability and robustness.

**Development Requirements:**

1. **Hardware**:
   * Devices for development and testing, such as PCs, VR headsets, and compatible sensors.
   * Storage servers for database management.
2. **Software and Tools**:
   * **Programming Languages**: Python, JavaScript (Node.js, Express.js).
   * **Libraries/Frameworks**: TensorFlow for AI, OpenCV for visual processing, React/Figma for UI.
   * **Databases**: MongoDB for scalable storage and Firebase for real-time data handling.
   * **APIs**: Twilio for communication, VISA for payments, and OpenAI API for NLP.
   * **Testing Tools**: Postman for API testing and Selenium for automated UI testing.
3. **Human Resources**:
   * A multidisciplinary team of front-end and back-end developers, AI specialists, VR experts, and UI/UX designers.
4. **Development Methodology**:
   * Incremental Software Process Model to ensure iterative testing and development with user feedback integration.
5. **Environment**:
   * Cloud-based deployment environment for scalability.
   * Secure networks for data handling and API integration.
6. **Regulatory Compliance**:
   * Ensure adherence to data privacy laws such as GDPR and local security regulations.

# Requirement Analysis

The following parts of Software Requirements Specification (SRS) report should be included in this chapter.

## Requirement Elicitation Techniques.

* **1. Interviews**

**Purpose:**

* Gather an in-depth understanding of stakeholders’ needs.
* Facilitate direct interaction with users to understand detailed and specific requirements.
* **2. Surveys and Questionnaires**

**Purpose:**

* Collect data efficiently from a large audience to understand general user expectations and preferences.
* **3. Workshops**

**Purpose:**

* Encourage collaboration between stakeholders and developers.
* Obtain immediate feedback to refine requirements and align project goals.
* **4. Observation**

**Purpose:**

* Identify user needs by observing their interactions with existing systems or workflows.
* Highlight pain points and inefficiencies to inform better design.
* **5. Prototyping**

**Purpose:**

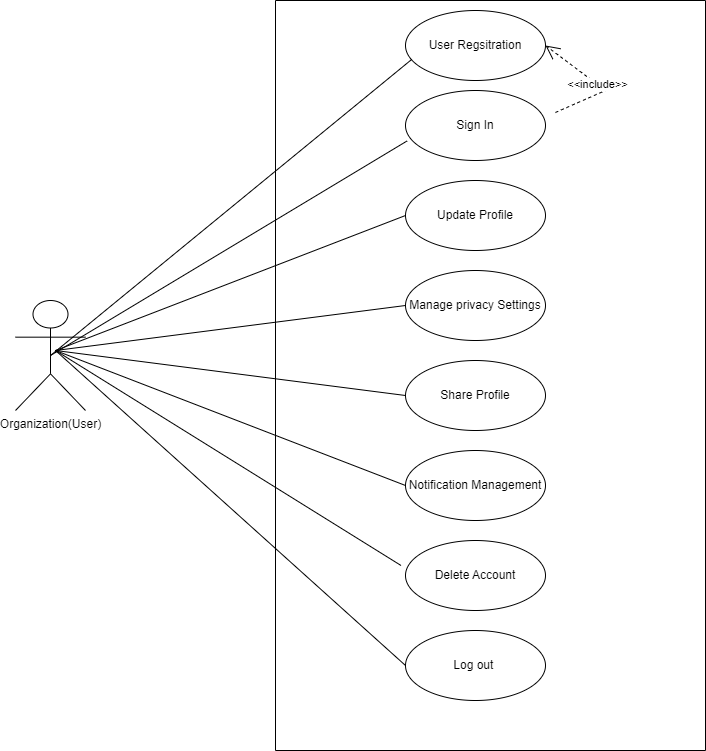
* Visualize features provided by users during requirement gathering.
* Validate ideas and gather feedback to ensure usability and functionality.



## Use Cases Diagram(s)

Following are the use case diagrams of all the modules:

1. **Module 1: Profile Management:**

****

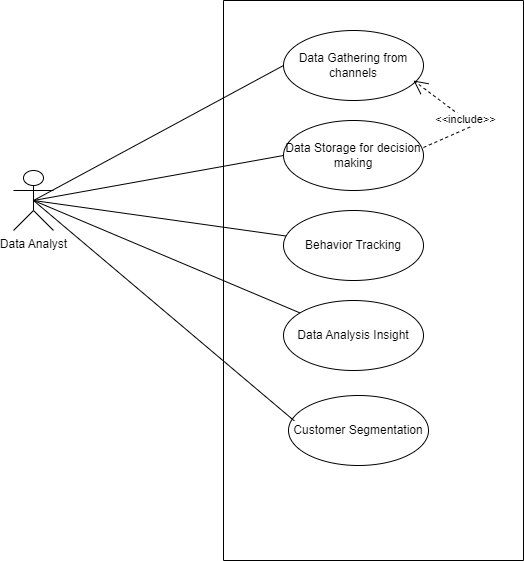
**Figure 3.1.1: UC Diagram Profile Management Module (Organization)**

**A screenshot of a computer screen

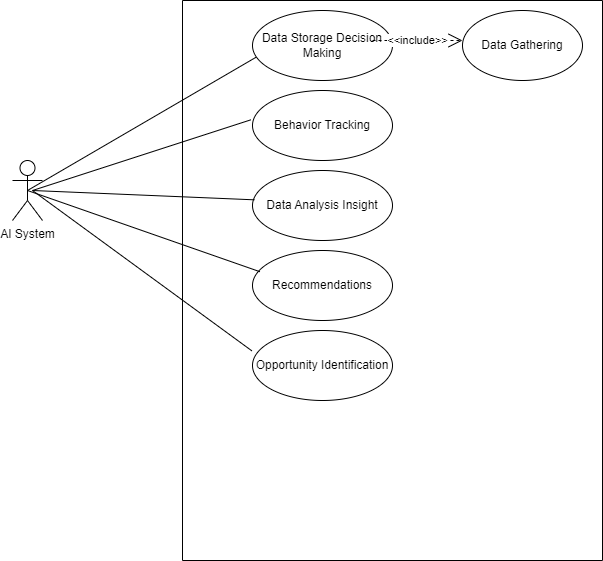
Description automatically generated**

**Figure 3.1.2: UC Diagram for Profile Management Module (Admin)**

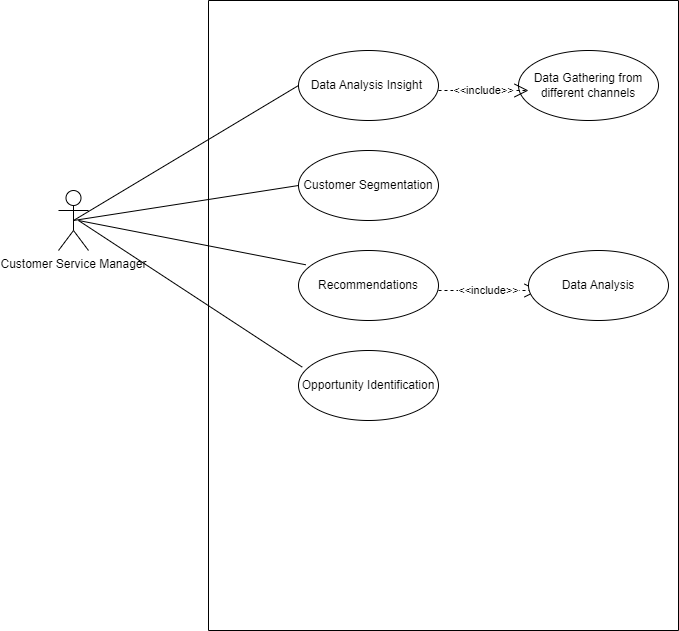
**Module 2: Pre-Processing**

****

**Figure 3.2.1: UC Diagram for Module Customer Interaction Analysis ( Data Analyst Admin)**

****

**Figure 3.2.2: UC Diagram for Customer Interaction Analysis Module (AI system)**

****

**Figure 3.2.3: UC Diagram for Customer Interaction Analysis Module (Customer Service Manager)**

**Module 3: Personalization**

**A diagram of a diagram

Description automatically generated**

**Figure 3.3.1: UC Diagram for Customer (primary Actor)**

**A diagram of a diagram

Description automatically generated**

**Figure 3.3.2: UC Diagram for Recommendation Engine (Secondary)**

**A diagram of a diagram

Description automatically generated**

**Figure 3.3.3: UC Diagram for Marketing Team (Secondary)**

**A diagram of a diagram

Description automatically generated**

**Figure 3.3.4: UC Diagram for Personalization Engine (Secondary)**

**Module 4: Performance Metrics Dashboard:**

**A diagram of a diagram

Description automatically generated**

**Figure 3.4.1: UC Diagram for Admin(Primary)**

**A diagram of a person with a diagram

Description automatically generated**

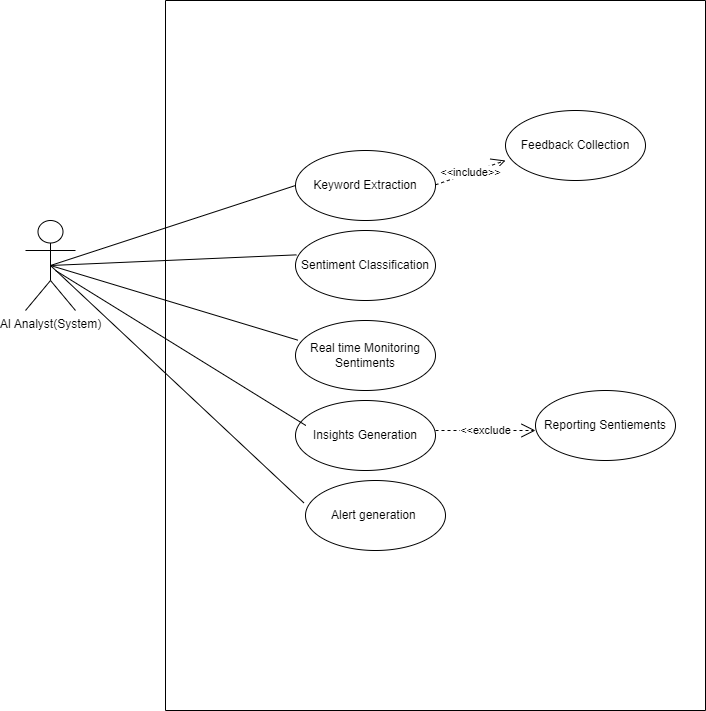
**Figure 3.4.2: UC Diagram for Dashboard System (Secondary)**

**A diagram of a diagram

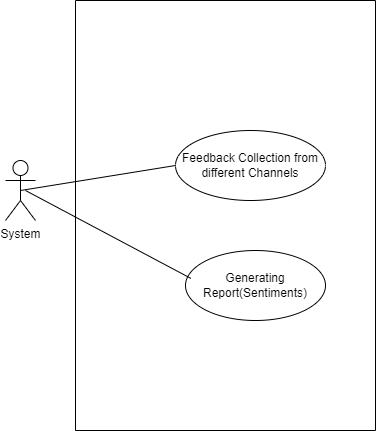
Description automatically generated**

**Figure 3.4.3: UC Diagram for Analytics System (Secondary)**

**Module 5: Sentimental Analysis:**

****

**Figure 3.5.1: UC Diagram Sentimental Analysis Module (AI Analyst)**

****

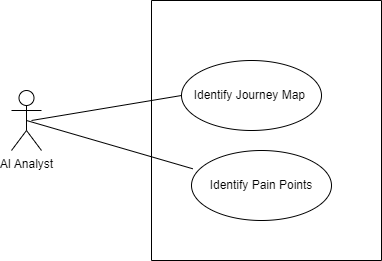
**Figure 3.5.2: UC Diagram Sentimental Analysis Module (system)**

**Module 6: Customer Journey map**

**A screenshot of a cell phone

Description automatically generated**

**Figure 3.6.1: UC Diagram for Customer Journey map Module (system(Organization)**

****

**Figure 3.6.2: UC Diagram for Customer Journey map Module (AI analyst)**

**Module 7: Loyalty And Reward Programs**

**A diagram of a diagram

Description automatically generated**

**Figure 3.7.1: UC Diagram for Admin (Primary)**

**A diagram of a diagram

Description automatically generated**

**Figure 3.7.2: UC Diagram for Customer (secondary)**

**Module 8: Pricing and Subscriptions**

**A close-up of a diagram

Description automatically generated**

**Figure 3.8: UC Diagram for Admin (Primary)**

**A diagram of a person's diagram

Description automatically generated**

**Figure 3.8.2: UC Diagram for Customer (Secondary)**

## Detailed Use Case (Tabular- Module Wise)

Following are the tabular use cases of this application:

**Module 1: Profile Management**

Table 1.1: User Registration



## User Registration

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.1 |
| **Use Case Name:** | User Registration |
| **Actors:** | User (Organization) |
| **Description:** | Allow user to register providing necessary details. |
| **Trigger:** | Clicking the Sign-Up button after on landing page. |
| **Preconditions:** | User is not registered. |
| **Postconditions:** | Account is created. |
| **Normal Flow:** | 1. Display Sign Up form 2. Fill details(email , password etc.) 3. Validate details 4. Create new account. 5. Confirmation email |
| **Alternative Flows:** | User tries to register with existing email.   * An error indicating email is already in use. * User can log in instead. |
| **Exceptions:** | If the user will enter wrong information, it will return a error to enter correctly. |

## User Sign In

Table 1.3: User Sign In

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.2 |
| **Use Case Name** | User Sign In |
| **Actors** | User (Organization) |
| **Description** | Allow user to sign in using credentials |
| **Trigger** | User will click Sign In button on landing page. |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to registered into the system. |
| **Postconditions** | User is logged in. |
| **Normal Flow** | 1. Display log in form 2. Enter credentials 3. System validates the information 4. Credentials correct, system access available   . |
| **Alternative Flows** | If user forgot password click on forgot password to reset |
| **Exceptions** | Credentials are incorrect, system shows an error message. |

## Update Profile:

Table 1.3: Update Profile:

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.3 |
| **Use Case Name** | Update Profile |
| **Actors** | User (Organization) |
| **Description** | Allow user to modify personal information. |
| **Trigger** | User will click “Edit Profile” while viewing profile. |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to logged in into the system. |
| **Postconditions** | User profile updated. |
| **Normal Flow** | 1. Go to profile page 2. Edit necessary information 3. Save changes 4. Updated Profile. |
| **Alternative Flows** | None |
| **Exceptions** | Server error:  Error message indicating temporary issue. |

## View Customer Profile

Table 1.4: View Customer Profile

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.4 |
| **Use Case Name** | View Customer Profile |
| **Actors** | User (Organization)/ Admin |
| **Description** | Allow user to view detail of customer. |
| **Trigger** | User will click “Customer name in customer list |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to logged in into the system. |
| **Postconditions** | Customer profile displayed. |
| **Normal Flow** | 1. Go to customer profile section 2. Select profile 3. Display details |
| **Alternative Flows** | Profile is unavailable. |
| **Exceptions** | Server error:  Error message indicating temporary issue. |

## Manage Privacy Settings

Table 1.5: Manage Privacy Settings

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.5 |
| **Use Case Name** | Manage Privacy Settings |
| **Actors** | User (Organization) |
| **Description** | Allow user to adjust privacy. |
| **Trigger** | User will click “Privacy Settings” option in menu |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to log in into the system. |
| **Postconditions** | Privacy Settings updated. |
| **Normal Flow** | 1. Go to customer profile section 2. Select privacy settings 3. Save changes 4. Update privacy settings |
| **Alternative Flows** | None |
| **Exceptions** | Server error:  Error message indicating temporary issue. |

## Share Profile

Table 1.6: Share Profile (s)

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.6 |
| **Use Case Name** | Share Profile |
| **Actors** | User (Organization) |
| **Description** | Allow user to shares profiles on social platforms. |
| **Trigger** | User will click “Share Profile” option in profile page |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to log in into the system. |
| **Postconditions** | Profile is shared. |
| **Normal Flow** | 1. Go to customer profile section 2. Select share options 3. User confirm social platform 4. System share profile link |
| **Alternative Flows** | None. |
| **Exceptions** | Server error:  Error message indicating temporary issue. |

## Notification Management

Table 1.7: Notification Management

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.7 |
| **Use Case Name** | Notification Management |
| **Actors** | User (Organization) |
| **Description** | Allow user to manage notification preferences. |
| **Trigger** | User will click “Notification Settings ” option in profile menu. |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to log in into the system. |
| **Postconditions** | Notifications are updated |
| **Normal Flow** | 1. Go to customer profile section 2. Select notifications settings 3. Save changes 4. System Update notifications settings |
| **Alternative Flows** | Disable all notifications   * User uncheck all notifications * System update. |
| **Exceptions** | Server error:  Error message indicating temporary issue. |

## Customers Profile

Table 1.8: Customers Profile

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.8 |
| **Use Case Name** | Customers Profile |
| **Actors** | Admin |
| **Description** | Admin will view and manage profiles data. |
| **Trigger** | Admin will click on “Customers” option in admin dashboard. |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to log in into the system. |
| **Postconditions** | Customer profile displayed. |
| **Normal Flow** | 1. Admin navigates to customer section 2. Select customer profile 3. Display details |
| **Alternative Flows** | If no customers found display no customer profile available. |
| **Exceptions** | Server error:  Error message indicating temporary issue. |

## Delete Account

Table 1.9: Delete Account

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.9 |
| **Use Case Name** | Delete Account |
| **Actors** | User |
| **Description** | User will delete account temporarily or permanently. |
| **Trigger** | User click on Delete profile in account settings. |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to log in into the system. |
| **Postconditions** | Customer account deleted |
| **Normal Flow** | 1. User go to account settings 2. Select the delete option 3. Confirm deletion 4. Account deleted |
| **Alternative Flows** | If customer cancel deletion process return back |
| **Exceptions** | Server error:  Error message indicating temporary issue. |

## Log Out

Table 1.10: Log Out

|  |  |
| --- | --- |
| **Use Case ID:** | M1-UC1.10 |
| **Use Case Name** | Log Out |
| **Actors** | User |
| **Description** | User will log out of the system. |
| **Trigger** | User click on “Log out ” button in account settings. |
| **Preconditions** | PR-1: User must be online and connected to the internet.  PR-2: User needs to log in into the system. |
| **Postconditions** | User is logged out |
| **Normal Flow** | 1. User go to account settings 2. Select the log out option 3. Confirm 4. Logged out |
| **Alternative Flows** | If logged out system display error. |
| **Exceptions** | Server error:  Error message indicating temporary issue. |

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1. **Module 2: Customer Interaction Analysis:**

## Data Gathering

Table 2.1: Data Gathering

|  |  |
| --- | --- |
| **Use Case ID:** | M2-UC2.1 |
| **Use Case Name** | Data Gathering |
| **Actors** | System |
| **Description** | Collect data from different channels. |
| **Trigger** | System “Connect with Channels”. |
| **Preconditions** | Customer interaction channels are integrated with the system |
| **Postconditions** | Data stored for further processing |
| **Normal Flow** | 1. System connect with all the customer interactions channels 2. Data extracted from channels 3. Data is organized 4. Data is used for further analyze. |
| **Alternative Flows** | If the channels is unavailable, display error and get from other channels. |
| **Exceptions** | Data extraction fail. |

## Data Analysis Insights

Table 2.2: Data Analysis Insights

|  |  |
| --- | --- |
| **Use Case ID:** | M2-UC2.2 |
| **Use Case Name** | Data Analysis Insights |
| **Actors** | Data Analyst |
| **Description** | Collect data from different channels to generate insights |
| **Trigger** | “Generate Insight” |
| **Preconditions** | Customer data is gathered and accessible. |
| **Postconditions** | Data will process for analyses. |
| **Normal Flow** | 1. System retrieves the data. 2. AI algorithms to analyze data 3. Reports of analyzed data |
| **Alternative Flows** | If data is incomplete, still generate insights. |
| **Exceptions** | Data analysis fail due to incomplete data. |

## Customer Segmentation

Table 2.3: Customer Segmentation

|  |  |
| --- | --- |
| **Use Case ID:** | M2-UC2.3 |
| **Use Case Name** | Customer Segmentation |
| **Actors** | Admin (System) |
| **Description** | Segment customer on the base of behaviors |
| **Trigger** | System will “Generate Segmentation” of customer data. |
| **Preconditions** | Customer data is gathered and insights are generated |
| **Postconditions** | Customer grouped based on behavior |
| **Normal Flow** | 1. System get the insights 2. Customer segmented based on behavior 3. Segment data stored for use in future |
| **Alternative Flows** | If segment rule not followed, not on basis of demographics. |
| **Exceptions** | System Fails to segment data |

## Data Storage for decision making

Table 2.4: Data Storage for decision making

|  |  |
| --- | --- |
| **Use Case ID** | M2-UC2.4 |
| **Use Case Name** | Data Storage for decision making |
| **Actors** | System |
| **Description** | Store data is analyzed for decision making |
| **Trigger** | System triggers stored data for decision making |
| **Preconditions** | Data is analyzed. |
| **Postconditions** | Data is used for decision making. |
| **Normal Flow** | 1. Data is stored 2. Data is analyzed 3. Data is use for decision making   . |
| **Alternative Flows** | Storage space is insufficient for making insights that help in decision making. |
| **Exceptions** | Data Storage fail due to less space |

## Behavior Tracking

Table 2.5: Behavior Tracking

|  |  |
| --- | --- |
| **Use Case ID** | M2-UC2.5 |
| **Use Case Name** | Behavior tracking |
| **Actors** | System (AI tool) |
| **Description** | Store data is analyzed for behavior of customers |
| **Preconditions** | Data is analyzed. |
| **Postconditions** | Customer behaviors tracked either they are satisfied with product or not |
| **Normal Flow** | 1. Data is stored 2. Data is analyzed 3. Data is use identify customer behavior. |
| **Alternative Flows** | Connection fail for tracking, connection is restored |
| **Exceptions** | System may crash so could not track customer behavior |

## Recommendations

Table 2.6 : Recommendations

|  |  |
| --- | --- |
| **Use Case ID** | M2-UC2.6 |
| **Use Case Name** | Recommendations |
| **Actors** | System (AI tool) |
| **Description** | Personalized recommendation on the behavior of customer. |
| **Preconditions** | Data is analyzed. |
| **Postconditions** | Data is used for giving recommendation to customers |
| **Normal Flow** | 1. Data is stored 2. Data is analyzed 3. Data is use for decision making 4. Tool will give recommendations to customers   . |
| **Alternative Flows** | Storage space is insufficient for making insights that help in giving recommendations |
| **Exceptions** | Recommendation fail due to algorithm not functioning |

## Opportunity Identification

Table 2.7: Opportunity Identification

|  |  |
| --- | --- |
| **Use Case ID** | M2-UC2.7 |
| **Use Case Name** | Opportunity Identification |
| **Actors** | System (AI tool) |
| **Description** | Store data is analyzed to identify the opportunity. |
| **Preconditions** | Data is analyzed. |
| **Postconditions** | Opportunities are identified. |
| **Normal Flow** | 1. Data is stored 2. Data is analyzed 3. Data is use identify customer behavior. 4. Opportunity is identified |
| **Alternative Flows** | Connection fail for tracking, connection is restored |
| **Exceptions** | System may crash so could not track data for opportunity identification |

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**Module 3: Personalization**

Below are the cases for Module-3.

## Personalized Product Recommendations

Table 3.1: Personalized Product Recommendations

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.1 |
| **Use Case Name** | Personalized Product Recommendations |
| **Actors** | **Primary Actor:** Customer  **Secondary Actors:** Recommendation Engine |
| **Description** | The system suggests products based on the customer’s purchase history and preferences. |
| Trigger | A customer views product recommendations on the platform. |
| Level | High |
| **Preconditions** | PRE-1: The customer has an active profile with stored purchase history.  - PRE-2: The recommendation engine is operational. |
| **Postconditions** | - POST-1: Relevant product suggestions are displayed to the customer.  - POST-2: The recommendation data is updated for future use. |
| **Normal Flow** | 1. The customer logs into their profile.  2. The system retrieves purchase history and preferences.  3. The recommendation engine processes the data.  4. Personalized product recommendations are displayed. |
| **Alternative Flows** | 1. The system recommends popular items based on general customer preferences. |
| **Exceptions** | 1. If the recommendation engine fails, the system defaults to showing popular products. |
| Business Rules | - BR-1: Only products available in stock are recommended. |
| Assumptions | - Assume that 70% of customers will receive relevant recommendations. |

## Real-Time Personalization Offers

Table 3.2: Real-Time Personalization Offers

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.2 |
| **Use Case Name** | Real-Time Personalization Offers |
| **Actors** | **Primary Actor:** Customer  **Secondary Actors:** Personalization Engine |
| Description | The system generates real-time personalized offers based on the customer’s browsing behavior. |
| Trigger | A customer browses products on the platform. |
| Level | High |
| **Preconditions** | - PRE-1: The personalization engine is operational.  - PRE-2: The customer is logged into their account. |
| **Postconditions** | - POST-1: Real-time offers are displayed to the customer. |
| **Normal Flow** | 1. The customer browses products on the platform.  2. The system monitors the customer’s behavior.  3. The personalization engine generates real-time offers.  4. Offers are displayed based on the customer’s browsing history. |
| **Alternative Flows** | 1. The system generates offers based on general behavior patterns. |
| **Exceptions** | 1. The system shows default promotional offers. |
| **Business Rules** | - BR-1: Offers are only valid during the current browsing session. |
| **Assumptions** | - Assume that 50% of customers will interact with real-time offers. |

## Customizable User Preferences

Table 3.3: Customizable User Preferences

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.3 |
| **Use Case Name** | Customizable User Preferences |
| **Actors** | **Primary Actor:** Customer  **Secondary Actors:** Preference Management System |
| **Description** | The system allows customers to customize their preferences for product recommendations. |
| **Trigger** | A customer accesses the preferences section of their account. |
| **Level** | Medium. |
| **Preconditions** | - PRE-1: The customer is logged into their account.  - PRE-2: The preference management system is operational. |
| **Postconditions** | - POST-1: The customer’s preferences are updated in the system. |
| **Normal Flow** | 1. The customer navigates to the preferences section.  2. The system displays current preferences.  3. The customer modifies their preferences.  4. The system saves the updated preferences. |
| **Alternative Flows** | 1. The system prompts the customer to set their preferences for the first time. |
| **Exceptions** | 1. If the update fails, the system notifies the customer and suggests retrying. |
| **Business Rules** | - BR-1: Only valid preference options can be selected. |
| **Assumptions** | Assume that customers will frequently update their preferences. |

## Personalized Email Campaigns

Table 3.4: Personalized Email Campaigns

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.4 |
| **Use Case Name** | Personalized Email Campaigns |
| **Actors** | **Primary Actor:** Marketing Team  **Secondary Actors:** Email Marketing System |
| **Description** | The system sends personalized email campaigns based on customer behavior and preferences. |
| **Trigger** | The marketing team initiates an email campaign. |
| **Level** | High. |
| **Preconditions** | -PRE-1: The email marketing system is operational.  - PRE-2: Customer preferences and behavior data are available. |
| **Postconditions** | - POST-1: Emails are sent to targeted customers. |
| **Normal Flow** | 1. The marketing team selects a campaign type.  2. The system retrieves customer data for targeting.  3. Personalized emails are generated based on customer data.  4. The system sends the emails to the targeted list. |
| **Alternative Flows** | None. |
| **Exceptions** | 1. If the sending fails, the system logs an error and retries later. |
| **Business Rules** | - BR-1: Emails must comply with anti-spam regulations. |
| **Assumptions** | - Assume that 80% of customers will open personalized emails. |

## Guided Item Navigation

Table 3.5 Guided Item Navigation

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.5 |
| **Use Case Name** | Guided Item Navigation |
| **Actors** | **Primary Actor**: Customer  **Secondary Actors:** Navigation System |
| **Description** | The system assists customers in navigating through product categories to find items of interest. |
| **Trigger** | A customer searches for a product on the platform. |
| **Level** | Medium |
| **Preconditions** | - PRE-1: The navigation system is operational.  - PRE-2: The customer is logged into their account. |
| **Postconditions** | - POST-1: The customer is guided to relevant product categories. |
| **Normal Flow** | 1. The customer initiates a search for a product.  2. The system analyzes search terms and preferences.  3. The system displays guided navigation options.  4. The customer selects a category and views available products. |
| **Alternative Flows** | 1. The system informs the customer that no recommendations are available. |
| **Exceptions** | 1. The system displays an error message if navigation fails. |
| **Business Rules** | - BR-1: Categories must be relevant to the customer’s preferences. |
| **Assumptions** | - Assume that customers appreciate guided navigation. |

## Predictive Personalization

Table 3.6: Predictive Personalization

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.6 |
| **Use Case Name** | Predictive Personalization |
| **Actors** | **Primary Actor:** Marketing Team  **Secondary Actors:** Predictive Analytics Engine |
| **Description** | The system uses predictive analytics to forecast customer needs and personalize experiences. |
| **Trigger** | A customer logs into their account or interacts with the platform. |
| **Level** | High. |
| **Preconditions** | - PRE-1: The predictive analytics engine is functional.  - PRE-2: Customer interaction data is available for analysis. |
| **Postconditions** | - POST-1: Personalized suggestions based on predictions are displayed. |
| **Normal Flow** | 1. The customer logs into their account.  2. The system analyzes interaction data and identifies patterns.  3. Predictive analytics generates recommendations.  4. The system displays personalized suggestions to the customer. |
| **Alternative Flows** | 1. The system defaults to displaying popular products. |
| **Exceptions** | 1. If the analytics engine fails, the system shows a notification. |
| **Business Rules** | - BR-1: Predictions must be based on at least 3 prior interactions. |
| **Assumptions** | - Assume that 65% of predictions will match customer interests. |

## Dynamic Web Content Display

Table 3.7: Dynamic Web Content Display

|  |  |
| --- | --- |
| **Use Case ID** | M3-UC3.7 |
| **Use Case Name** | Dynamic Web Content Display |
| **Actors** | Primary Actor: Customer  Secondary Actors: Web Content Management System |
| **Description** | The system dynamically updates web content based on customer preferences and interactions. |
| **Trigger** | A customer navigates through the website. |
| **Level** | Medium |
| **Preconditions** | - PRE-1: The web content management system is integrated with customer data. |
| **Postconditions** | - POST-1: Relevant content is displayed based on the customer's profile. |
| **Normal Flow** | 1. The customer visits the website.  2. The system retrieves customer profile data.  3. Dynamic content is generated based on preferences.  4. The customer views personalized content on the page. |
| **Alternative Flows** | 1. The system displays general content if no specific preferences are found. |
| **Exceptions** | 1. If the CMS fails, the system displays default content. |
| **Business Rules** | - BR-1: Content must be updated in real-time based on interactions. |
| **Assumptions** | - Assume that customers engage more with personalized content. |

## Cross-Selling Recommendations

Table 3.8: Cross-Selling Recommendations

|  |  |
| --- | --- |
| **Use Case ID** | M2-UC3.8 |
| **Use Case Name** | Cross-Selling Recommendations |
| **Actors** | Primary Actor: Customer  Secondary Actors: Recommendation Engine |
| **Description** | The system suggests complementary products based on the customer’s current selections. |
| **Trigger** | A customer adds a product to their cart. |
| **Level** | Medium |
| **Preconditions** | - PRE-1: The recommendation engine is operational.  - PRE-2: The customer has products in their cart. |
| **Postconditions** | - POST-1: Complementary product suggestions are displayed. |
| **Normal Flow** | 1. The customer adds a product to their cart.  2. The system retrieves related products from the database.  3. The recommendation engine generates cross-selling suggestions.  4. Suggested products are displayed on the cart page. |
| **Alternative Flows** | 1. The system informs the customer that no recommendations are available. |
| **Exceptions** | 1. If the engine fails, the system defaults to showing popular products. |
| **Business Rules** | - BR-1: Recommendations must be based on current market trends. |
| **Assumptions** | - Assume that 30% of customers will add suggested items to their cart. |

**Module 4: Performance Metrics Dashboard**

Below are the uses cases for Module-4

## KPIs Monitoring

Table 4.1: KPIs Monitoring

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.1 |
| **Use Case Name** | KPIs Monitoring |
| **Actors** | Primary Actor: Admin  Secondary Actors: Dashboard System |
| **Description** | The system monitors key performance indicators (KPIs) related to customer satisfaction, such as NPS and CSAT, and displays them on a dashboard for tracking performance in real time. |
| **Trigger** | The admin accesses the performance metrics dashboard. |
| **Level** | High |
| **Preconditions** | -PRE-1: The dashboard system is connected to various data sources.  - PRE-2: The admin has the necessary access privileges. |
| **Postconditions** | -POST-1: KPIs are displayed on the dashboard in real-time.  -POST-2: The KPI data is available for reporting purposes. |
| **Normal Flow** | 1. The admin logs into the dashboard system.  2. The system retrieves KPIs from multiple data sources.  3. The system processes and displays KPIs like NPS, customer retention, and satisfaction scores. |
| **Alternative Flows** | 1. The system indicates that some KPI data sources are unavailable.  2. The system continues to display available data, and the admin is notified. |
| **Exceptions** | 1. If the system fails to retrieve KPI data, it retries after 10 minutes. |
| **Business Rules** | - BR-1: KPI data should be updated in real-time to ensure accuracy. |
| **Assumptions** | - Assume that all necessary KPIs are tracked and integrated in the system. |

## Customer Retention Tracking

Table 4.2: Customer Retention Tracking

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.2 |
| **Use Case Name** | Customer Retention Tracking |
| **Actors** | Primary Actor: Admin  Secondary Actors: Customer Database |
| **Description** | The system tracks customer retention metrics and displays insights into customer loyalty and churn rates. |
| **Trigger** | The admin accesses the customer retention section of the dashboard. |
| **Level** | Medium |
| **Preconditions** | - PRE-1: The customer database is connected to the dashboard.  - PRE-2: The admin has sufficient access rights. |
| **Postconditions** | - POST-1: Customer retention metrics are displayed.  - POST-2: Retention insights are available for reporting. |
| **Normal Flow** | 1. The admin logs into the dashboard.  2. The system retrieves customer retention data from the database.  3. The retention metrics are displayed on the dashboard. |
| **Alternative Flows** | 1. The system notifies the admin of incomplete retention data.  2. The system continues displaying available retention metrics. |
| **Exceptions** | 1. The system logs an error and retries every 15 minutes. |
| **Business Rules** | - BR-1: Retention metrics should be updated daily. |
| **Assumptions** | - Assume that customer retention data is accurate and up-to-date. |

## Real-Time Performance Monitoring

Table 4.3: Real-Time Performance Monitoring

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.3 |
| **Use Case Name** | Real-Time Performance Monitoring |
| **Actors** | Primary Actor: Admin  Secondary Actors: Dashboard System |
| **Description** | The system provides real-time performance monitoring of customer satisfaction and operational efficiency. |
| **Trigger** | The admin opens the real-time monitoring section on the dashboard. |
| **Level** | High |
| **Preconditions** | - PRE-1: The dashboard system is operational and connected to live data sources. |
| **Postconditions** | - POST-1: Real-time performance data is displayed on the dashboard. |
| **Normal Flow** | 1. The admin logs into the system.  2. The system retrieves live data from various sources.  3. The system processes the data and displays real-time performance metrics. |
| **Alternative Flows** | 1. If there is a delay in data retrieval, the system informs the admin and continues to update as data becomes available. |
| **Exceptions** | 1. The system retries retrieving live data after 5 minutes. |
| **Business Rules** | - BR-1: Real-time data must be updated every minute. |
| **Assumptions** | - Assume that real-time data sources are reliable and continuous. |

## Churn Rate Analysis

Table 4.4: Churn Rate Analysis

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.4 |
| **Use Case Name** | Churn Rate Analysis |
| **Actors** | Primary Actor: Admin  Secondary Actors: Analytics Engine |
| **Description** | The system analyzes customer churn rates and displays trends in customer loss, providing insights into potential causes and solutions. |
| **Trigger** | The admin opens the churn analysis section on the dashboard. |
| **Level** | Medium |
| **Preconditions** | - PRE-1: The analytics engine is operational and connected to customer data. |
| **Postconditions** | - POST-1: Churn rate data is displayed with trends and insights. |
| **Normal Flow** | 1. The admin logs into the system.  2. The system retrieves and analyzes churn rate data.  3. The system displays trends and potential causes of churn. |
| **Alternative Flows** | 1. The system notifies the admin of missing data and continues with available data. |
| **Exceptions** | N/A |
| **Business Rules** | - BR-1: Churn data should be refreshed every 24 hours. |
| **Assumptions** | - Assume that customer churn patterns remain consistent over time. |

## Metrics Comparison Over Time

Table 4.5: Metrics Comparison Over Time

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.5 |
| **Use Case Name** | Metrics Comparison Over Time |
| **Actors** | Primary Actor: Admin  Secondary Actors: Historical Data System |
| **Description** | The system allows admins to compare performance metrics over different time periods to identify trends and progress. |
| **Trigger** | The admin selects different time periods for comparison. |
| **Level** | Medium |
| **Preconditions** | - PRE-1: Historical performance data is available in the system. |
| **Postconditions** | - POST-1: Comparison of metrics over the selected time periods is displayed. |
| **Normal Flow** | 1. The admin selects a time period for comparison.  2. The system retrieves historical performance data.  3. The system displays the comparison of metrics over time. |
| **Alternative Flows** | 1. The system notifies the admin of missing historical data and continues with available data. |
| **Exceptions** | 1. The system retries retrieval every 10 minutes. |
| **Business Rules** | - BR-1: Historical data must be maintained for at least 1 year. |
| **Assumptions** | - Assume that historical data is complete and accurate. |

## Areas for Improvement Identification

Table 4.6: Areas for Improvement Identification

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.6 |
| **Use Case Name** | Areas for Improvement Identification |
| **Actors** | Primary Actor: Admin  Secondary Actors: Analytics Engine |
| **Description** | The system identifies areas for improvement in customer service and operational performance based on performance data. |
| **Trigger** | The admin opens the improvement suggestions section on the dashboard. |
| **Level** | Medium |
| **Preconditions** | - PRE-1: The analytics engine is operational and has access to performance data. |
| **Postconditions** | - POST-1: Areas for improvement are identified and displayed to the admin. |
| **Normal Flow** | 1. The admin logs into the system.  2. The system analyzes performance data.  3. The system generates a list of areas that need improvement. |
| **Alternative Flows** | 1. The system informs the admin that no significant areas for improvement were detected. |
| **Exceptions** | 1. The system logs an error and retries analysis after 10 minutes. |
| **Business Rules** | - BR-1: Improvement suggestions must be generated based on key performance metrics. |
| **Assumptions** | - Assume that performance data is sufficient to detect areas for improvement. |

## Performance Reports Generation

Table 4.7: Performance Reports Generation

|  |  |
| --- | --- |
| **Use Case ID** | M4-UC4.7 |
| **Use Case Name** | Performance Reports Generation |
| **Actors** | **Primary Actor:** Admin  **Secondary Actors:** Reporting System |
| **Description** | The system generates detailed performance reports based on KPIs, customer satisfaction metrics, and retention data. |
| **Trigger** | The admin requests a performance report from the dashboard. |
| **Level** | High |
| **Preconditions** | - PRE-1: The reporting system is operational and connected to the data sources. |
| **Postconditions** | - POST-1: A detailed performance report is generated and available for download or viewing. |
| **Normal Flow** | 1. The admin selects the report type and time period.  2. The system retrieves relevant data for the report.  3. The system generates a performance report and displays it for review or download. |
| **Alternative Flows** | 1. The system flags the inconsistent data and informs the admin. |
| **Exceptions** | 1. The system logs an error and retries after 5 minutes. |
| **Business Rules** | - BR-1: Reports must include at least one performance metric. |
| **Assumptions** | - Assume that performance data is complete and up-to-date. |

## Dashboard Visualization of Metrics

Table 4.8: Dashboard Visualization of Metrics

|  |  |
| --- | --- |
| **Use Case ID** | M4-UC4.8 |
| **Use Case Name** | Dashboard Visualization of Metrics |
| **Actors** | Primary Actor: Admin  Secondary Actors: Visualization Engine |
| **Description** | The system visualizes performance metrics on a dashboard using graphs, charts, and tables for easy comprehension by admins. |
| **Trigger** | The admin accesses the metrics dashboard. |
| **Level** | High |
| **Preconditions** | - PRE-1: The visualization engine is integrated with performance data. |
| **Postconditions** | - POST-1: Metrics are visualized using graphs and charts on the dashboard. |
| **Normal Flow** | 1.The admin logs into the system.  2. The system retrieves performance data.  3. The system generates visual representations of the metrics.  4. The admin views and interacts with the visualized metrics. |
| **Alternative Flows** | - If data is delayed, the system informs the admin and continues to update as data is received. |
| **Exceptions** | 1. The system logs an error and retries after 5 minutes. |
| **Business Rules** | - BR-1: Visualizations must be updated in real-time for live data. |
| **Assumptions** | - Assume that visualizations are helpful for decision-making. |

**Module 5: Sentimental Analysis:**

**Use Cases:**

## Feedback Collection

Table 3.1: Feedback Collection

|  |  |
| --- | --- |
| **Use Case ID** | M3-UC3.1 |
| **Use Case Name** | Feedback Collection from Different Channels |
| **Actors** | User /System |
| **Description** | Collect data from different channels |
| **Trigger** | User click on “Submit” to submit feedback |
| **Preconditions** | System must be connected with all channels |
| **Postconditions** | Feedback is stored in database. |
| **Normal Flow** | 1. Feedback is given by user 2. Feedback data is stored in data base 3. This data is further analyzed.. |
| **Alternative Flows** | If feedback section is incomplete, notify user to complete. |
| **Exceptions** | Data storage failed if connection with channel disturbed. |

## Keyword Extraction

Table 3.2: Keyword Extraction

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.2 |
| **Use Case Name** | Keyword Extraction |
| **Actors** | AI System |
| **Description** | Enable the AI tool to extract the keywords that help in analyzing the information |
| **Trigger** | Feedback data to be analyze. |
| **Preconditions** | Feedback data is stored |
| **Postconditions** | Data stored from feedback will be analyzed for sentimental analysis. |
| **Normal Flow** | 1. User Enter the feedback 2. Data is stored 3. Keyword extracted for further analyzing |
| **Alternative Flows** | If keyword not extracted, try again. |
| **Exceptions** | .Extraction fail due to malfunction of AI tool |

## Sentimental Classification

Table 3.3: Sentimental Classification

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.3 |
| **Use Case Name** | Sentimental Classification |
| **Actors** | AI System |
| **Description** | AI tool will help analyze the sentiments of the customer |
| **Trigger** | Keyword extraction is completed. |
| **Preconditions** | Keyword extraction is completed successfully. |
| **Postconditions** | Sentiments are classified. |
| **Normal Flow** | 1. User Enter the feedback 2. Data is stored 3. Keyword extracted for further analyzing 4. Ai tool will classify the sentiments |
| **Alternative Flows** | If sentiments not classified, try again. |
| **Exceptions** | .Classification fails if malfunction with AI tool. |

## Real time Monitoring

Table 3.4: Real Time Monitoring

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.3 |
| **Use Case Name** | Real Time Monitoring |
| **Actors** | AI System/Admin |
| **Description** | AI tool will help giving response to the customer |
| **Trigger** | New feedback received. |
| **Preconditions** | Feedback received from different channels successfully. |
| **Postconditions** | Monitored feedback on real time and give responses. |
| **Normal Flow** | 1. User Enter the feedback 2. Data is stored 3. Feedback monitored on real time. |
| **Alternative Flows** | If no real time monitoring then queued for later. |
| **Exceptions** | .No monitor of feedback if malfunction with AI tool. |

## Alerts Generation

Table 3.5: Alert Generations

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.3 |
| **Use Case Name** | Alert Generation on Negative Sentiments |
| **Actors** | System/Admin |
| **Description** | Give alerts when negative feedback is given. |
| **Trigger** | Negative sentiments is classified |
| **Preconditions** | Feedback data is stored. |
| **Postconditions** | .Alert notifications sent to customer service team |
| **Normal Flow** | 1. User Enter the feedback 2. Data is stored 3. Feedback monitored on real time. 4. Alert on negative feedback |
| **Alternative Flows** | If alerts fails , then negative comments will be highlighted for later review |
| **Exceptions** | Notification not send if system is down. |

## Trend Analysis

Table 3.6: Trend Analysis

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.6 |
| **Use Case Name** | Trend Analysis |
| **Actors** | System/Admin |
| **Description** | Analyze sentimental trends over a time |
| **Trigger** | Larger data is collected |
| **Preconditions** | Feedback data is stored. |
| **Postconditions** | Trends would be analyzed. |
| **Normal Flow** | 1. User Enter the feedback 2. Data is stored 3. Feedback monitored on real time. 4. Data would be analyzed to see trends |
| **Alternative Flows** | If data is less, then wait over time |
| **Exceptions** | Analysis fails if data is not stored |

## Insights Generation

Table 3.7 : Insights Generation

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.7 |
| **Use Case Name** | Insights Generation |
| **Actors** | System |
| **Description** | Analyze data for getting insights. |
| **Trigger** | Analysis complete. |
| **Preconditions** | Analysis of customer interaction and feedback been evaluated. |
| **Postconditions** | Insights ready for decision making |
| **Normal Flow** | 1. Data is stored of all customer interactions 2. Data is analyzed 3. Sentiments of customer are evaluated 4. Hidden insights generation |
| **Alternative Flows** | If data is less, then wait over time |
| **Exceptions** | Analysis fails if data is not stored |

## Sentiment Report

Table 3.8: Sentiment Report

|  |  |
| --- | --- |
| **Use Case ID:** | M3-UC3.7 |
| **Use Case Name** | Sentiment Report |
| **Actors** | System/ User |
| **Description** | Analyze data for getting insights. |
| **Trigger** | Users click on “Generate Report “to generate report. |
| **Preconditions** | Analysis of customer interaction and feedback been evaluated, and insights have been generated |
| **Postconditions** | Sight has been generated. |
| **Normal Flow** | 1. Data is stored of all customer interactions 2. Sentiments are evaluated. 3. Sentiment report is generated. |
| **Alternative Flows** | If report not generated , it notify users to try again |
| **Exceptions** | Report fail if data is still being stored |

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**Module 6: Customer Journey Map**

Below are the uses cases for Module-

## Create Journey Map

Table 4.1: Create Journey Map

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.1 |
| **Use Case Name** | Create Journey Map |
| **Actors** | User |
| **Description** | Create customer journey map based on input and data analysis. |
| **Trigger** | Users click on “Create Journey Map “to create map. |
| **Preconditions** | User is logged in and have access to journey map |
| **Postconditions** | Journey Map has been generated. |
| **Normal Flow** | 1. Users select the profile of customer to generate customer journey map 2. Data is stored of all customer interactions 3. Journey map created |
| **Alternative Flows** | If customer data is missing, then system will extract the data. |
| **Exceptions** | Journey map creation fails if there is a database connectivity issue. |

## Identify Journey map:

Table 4.2: Identify Journey Map

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.2 |
| **Use Case Name** | Identify Journey Map |
| **Actors** | User |
| **Description** | Retrieve specific journey map on user Selection. |
| **Trigger** | Users selects a journey map from the list. |
| **Preconditions** | User is logged in and have access to journey maps |
| **Postconditions** | The selected journey map displayed that display a specific characteristic related thing. |
| **Normal Flow** | 1. Users open customer journey map 2. User select journey map from list 3. System retrieves the data and display on journey map. 4. Journey map created |
| **Alternative Flows** | If no data available for journey map, system display choose another map |
| **Exceptions** | System display an error if fails in processing journey map. |

## Share Journey Map

Table 4.:4 Share Journey Map

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.4 |
| **Use Case Name** | Share Journey Map |
| **Actors** | System/User |
| **Description** | Share the journey map with friends with friends and over different social platform. |
| **Trigger** | Users click on “Share Journey Map” button to share. |
| **Preconditions** | A journey map has been created |
| **Postconditions** | Journey map is shared among different platforms. |
| **Normal Flow** | 1. Users open customer journey map 2. User select to share among team members 3. System sends the journey map |
| **Alternative Flows** | None |
| **Exceptions** | System fails to share journey map due to connectivity issue. |

## Update Journey Map

Table 4.5: Update Journey Map

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.5 |
| **Use Case Name** | Update Journey Map |
| **Actors** | User |
| **Description** | Update the journey map by adding the new information. |
| **Trigger** | User click on “Update Journey map” for updating map |
| **Preconditions** | A journey map is selected for updating. |
| **Postconditions** | A journey map is updated and saved |
| **Normal Flow** | 1. Use select a journey map  2. User modifies the journey map.  System save the changes |
| **Alternative Flows** | N/A |
| **Exceptions** | Update fail if there is a internet connectivity issue |

## Delete Journey Map

Table 4.6: Delete Journey Map

|  |  |
| --- | --- |
| **Use Case ID:** | M4-UC4.6 |
| **Use Case Name** | Delete Journey Map |
| **Actors** | User |
| **Description** | Delete the journey map. |
| **Trigger** | User click on “Delete Journey map” for updating map |
| **Preconditions** | A journey map is selected for deletion. |
| **Postconditions** | A journey map is deleted |
| **Normal Flow** | 1. Use select a journey map  2. User select to delete the journey map.  System delete customer journey map |
| **Alternative Flows** | If suer cancel the deletion, the journey map not deleted |
| **Exceptions** | Deletion fails if database error during the process. |

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**Module 7: Loyalty and Reward Program**

Below are the uses cases for Module-7.

## Loyalty Program Creation

Table 7.1: Loyalty Program Creation

|  |  |
| --- | --- |
| **Use Case ID** | M7-UC7.1 |
| **Use Case Name** | Loyalty Program Creation |
| **Actors** | Primary Actor: Admin  Secondary Actors: Loyalty Program System |
| **Description** | The system allows admins to create and configure loyalty programs, including setting reward tiers and points allocation. Customers can enroll in the program and earn points for purchases and interactions. |
| **Trigger** | An admin initiates the creation of a new loyalty program. |
| **Level** | High |
| **Preconditions** | PRE-1: The loyalty program system is operational.  PRE-2: The admin has the appropriate access rights. |
| **Postconditions** | POST-1: A new loyalty program is created and activated.  POST-2: The loyalty program details are stored and made available for customer enrollment. |
| **Normal Flow** | 1. The admin logs into the loyalty program system.  2. The system prompts the admin to enter program details, including reward tiers and points allocation.  3. The admin reviews and saves the program.  4. The admin activates the program, making it available for customer enrollment. |
| **Alternative Flows** | The admin may choose to save the program as a draft instead of activating it immediately. |
| **Exceptions** | If the loyalty system is unavailable, the system logs an error and prompts the admin to retry later. |
| **Business Rules** | BR-1: A loyalty program must have at least one reward tier. |
| **Assumptions** | Assume that a majority of customers will participate in the loyalty program. |

## Customer Loyalty Tracking

Table 7.2: Customer Loyalty Tracking

|  |  |
| --- | --- |
| **Use Case ID** | M7-UC7.2 |
| **Use Case Name** | Customer Loyalty Tracking |
| **Actors** | Primary Actor: Admin  Secondary Actors: Customer Database |
| **Description** | The system tracks customer loyalty by monitoring their interactions, purchases, and accumulated loyalty points. |
| **Trigger** | The admin accesses the loyalty tracking dashboard. |
| **Level** | Medium |
| **Preconditions** | PRE-1: The customer database is integrated with the loyalty program system.  PRE-2: The admin has sufficient privileges to view customer loyalty data. |
| **Postconditions** | POST-1: The system displays the loyalty points and engagement data for each customer. |
| **Normal Flow** | 1. The admin logs into the system and navigates to the loyalty tracking section.  2. The system retrieves customer loyalty data, including points, purchase history, and engagement metrics.  3. The data is displayed for the admin to review. |
| **Alternative Flows** | If no loyalty data is available for a customer, the system informs the admin. |
| **Exceptions** | If the customer database is unavailable, the system logs an error and retries retrieval after 10 minutes. |
| **Business Rules** | BR-1: Loyalty points are updated in real-time with every customer purchase or engagement. |
| **Assumptions** | Assume that customer data in the database is accurate and up-to-date. |

## Reward Points Allocation

Table 7.3: Reward Points Allocation

|  |  |
| --- | --- |
| **Use Case ID** | M7-UC7.3 |
| **Use Case Name** | Reward Points Allocation |
| **Actors** | Primary Actor: Customer  Secondary Actors: Loyalty Program System |
| **Description** | The system allocates reward points to customers based on their purchases and interactions with the platform. |
| **Trigger** | A customer completes a purchase or engages in qualifying interactions. |
| **Level** | High |
| **Preconditions** | PRE-1: The loyalty program is active, and customers are enrolled in the program.  PRE-2: The customer completes a transaction or interaction that qualifies for points. |
| **Postconditions** | POST-1: The system allocates reward points to the customer's account. |
| **Normal Flow** | 1. The customer makes a qualifying purchase or completes an engagement action.  2. The system calculates the appropriate number of points.  3. The points are credited to the customer's loyalty account. |
| **Alternative Flows** | If the customer cancels the transaction, the system removes the points from their account. |
| **Exceptions** | If the system fails to allocate points, it retries the transaction within 5 minutes. |
| **Business Rules** | BR-1: Reward points are only allocated for qualifying transactions as defined by the program rules. |
| **Assumptions** | Assume that the majority of customers will accumulate points regularly. |

## Notify Customers of Loyalty Status

Table 7.4: Notify Customers of Loyalty Status

|  |  |
| --- | --- |
| **Use Case ID** | M7-UC7.4 |
| **Use Case Name** | Notify Customers of Loyalty Status |
| **Actors** | Primary Actor: Customer  Secondary Actors: Notification System |
| **Description** | The system sends notifications to customers about their loyalty status, including accumulated points, reward eligibility, and status updates. |
| **Trigger** | A customer reaches a new loyalty tier or accrues enough points to redeem rewards. |
| **Level** | Medium |
| **Preconditions** | PRE-1: The notification system is operational.  PRE-2: Customers are enrolled in the loyalty program. |
| **Postconditions** | POST-1: The customer receives a notification about their loyalty status. |
| **Normal Flow** | 1. The system detects that the customer has reached a new loyalty tier or accumulated enough points for rewards.  2. A notification is generated and sent to the customer via their preferred channel (email, SMS, app notification).  3. The customer reviews their updated loyalty status. |
| **Alternative Flows** | If the customer has opted out of notifications, the system logs the event but does not send a message. |
| **Exceptions** | If the notification system fails, the system retries sending the message after 5 minutes. |
| **Business Rules** | BR-1: Notifications must be sent within 24 hours of a loyalty status change. |
| **Assumptions** | Assume that most customers will actively monitor their loyalty status. |

## Personalized Offers for Loyal Customers

Table 7.5: Personalized Offers for Loyal Customers

|  |  |
| --- | --- |
| **Use Case ID** | M7-UC7.5 |
| **Use Case Name** | Personalized Offers for Loyal Customers |
| **Actors** | Primary Actor: Customer  Secondary Actors: Offer Engine |
| **Description** | The system generates and provides personalized offers to loyal customers based on their loyalty tier and purchasing habits. |
| **Trigger** | A customer reaches a specific loyalty tier or exhibits qualifying purchasing behavior. |
| **Level** | High |
| **Preconditions** | PRE-1: The loyalty program system and offer engine are operational. |
| **Postconditions** | POST-1: The customer receives personalized offers based on their loyalty status and purchase history. |
| **Normal Flow** | 1. The system identifies loyal customers eligible for personalized offers.  2. The offer engine generates personalized deals based on the customer's loyalty tier and purchasing behavior.  3. The offers are presented to the customer via their preferred communication channel. |
| **Alternative Flows** | If the customer declines the offer, the system logs the event and suggests future offers. |
| **Exceptions** | If the offer engine fails to generate offers, it retries within 10 minutes. |
| **Business Rules** | BR-1: Offers must be relevant to the customer's loyalty tier and purchase history. |
| **Assumptions** | Assume that personalized offers will improve customer engagement and loyalty. |

## Loyalty Program Effectiveness Analysis

Table 7.6: Loyalty Program Effectiveness Analysis

|  |  |
| --- | --- |
| **Use Case ID** | M7-UC7.6 |
| **Use Case Name** | Loyalty Program Effectiveness Analysis |
| **Actors** | Primary Actor: Admin  Secondary Actors: Analytics Engine |
| **Description** | The system analyzes the effectiveness of the loyalty program by evaluating customer engagement, redemption rates, and overall program success. |
| **Trigger** | The admin accesses the loyalty program analysis section on the dashboard. |
| **Level** | Medium |
| **Preconditions** | PRE-1: The analytics engine is operational and connected to loyalty program data. |
| **Postconditions** | POST-1: The system provides insights into the success and areas for improvement of the loyalty program. |
| **Normal Flow** | 1. The admin logs into the analytics dashboard.  2. The system retrieves data related to customer engagement, reward redemption, and program usage.  3. The analytics engine processes the data and generates a report on the loyalty program's effectiveness. |
| **Alternative Flows** | If no significant data is available, the system informs the admin and provides suggestions for gathering more data. |
| **Exceptions** | If the analytics engine fails, the system logs an error and retries analysis within 15 minutes. |
| **Business Rules** | BR-1: The program must be evaluated quarterly to ensure it meets company objectives. |
| **Assumptions** | Assume that loyalty program data will be sufficient to measure effectiveness. |

## Loyalty Reports Generation

Table 7.7: Loyalty Reports Generation

|  |  |
| --- | --- |
| **Use Case ID** | M7-UC7.7 |
| **Use Case Name** | Loyalty Reports Generation |
| **Actors** | Primary Actor: Admin  Secondary Actors: Reporting System |
| **Description** | The system generates detailed reports on the loyalty program, including customer participation, reward redemption rates, and overall engagement metrics. |
| **Trigger** | The admin requests a loyalty program report from the dashboard. |
| **Level** | High |
| **Preconditions** | PRE-1: The reporting system is operational and connected to loyalty data sources. |
| **Postconditions** | POST-1: The system generates a detailed report on the loyalty program and provides it for review or download. |
| **Normal Flow** | 1. The admin selects the report type and time period for the report.  2. The system retrieves loyalty program data from the relevant sources.  3. The system generates the report and presents it for review or download. |
| **Alternative Flows** | If data is missing or incomplete, the system notifies the admin and generates the report with available data. |
| **Exceptions** | If the report generation fails, the system retries after 5 minutes. |
| **Business Rules** | BR-1: Reports must include at least one metric related to customer loyalty. |
| **Assumptions** | Assume that loyalty program data is accurate and up-to-date. |

## Loyalty Program Integration with Sales Data

Table 7.8: Loyalty Program Integration with Sales Data

|  |  |
| --- | --- |
| **Use Case ID** | M7-UC7.8 |
| **Use Case Name** | Loyalty Program Integration with Sales Data |
| **Actors** | Primary Actor: Admin  Secondary Actors: Sales System |
| **Description** | The system integrates loyalty program data with sales data to provide a comprehensive view of customer behavior, loyalty, and purchasing habits. |
| **Trigger** | The admin initiates the integration of loyalty and sales data for analysis. |
| **Level** | Medium |
| **Preconditions** | PRE-1: The sales system and loyalty program are integrated and operational. |
| **Postconditions** | POST-1: The loyalty program data is successfully combined with sales data to provide insights into customer purchasing behavior and loyalty trends. |
| **Normal Flow** | 1. The admin accesses the data integration section of the system.  2. The system retrieves relevant data from both the sales and loyalty systems.  3. The data is combined and displayed on the dashboard for analysis. |
| **Alternative Flows** | If sales data is missing, the system notifies the admin and proceeds with available data. |
| **Exceptions** | If data integration fails, the system retries within 10 minutes. |
| **Business Rules** | BR-1: Sales and loyalty data must be integrated daily for accurate reporting. |
| **Assumptions** | Assume that loyalty program data and sales data are accurate and complete. |

**Module 8: Pricing and Subscription**

Below are the uses cases for Module-8.

## VR-Based Subscription Offering

Table 8.1: VR-Based Subscription Offering

|  |  |
| --- | --- |
| **Use Case ID** | M8-UC8.1 |
| **Use Case Name** | VR-Based Subscription Offering |
| **Actors** | Primary Actor: Customer  Secondary Actors: Subscription System |
| **Description** | The system offers VR-based subscription services to customers based on their preferences and provides access to exclusive VR content. |
| **Trigger** | A customer views subscription plans on the platform. |
| **Level** | Medium |
| **Preconditions** | PRE-1: The subscription system is operational.  PRE-2: The customer is logged into the platform. |
| **Postconditions** | POST-1: The customer selects a subscription plan and the payment is processed. |
| **Normal Flow** | 1. The customer views available subscription plans.  2. The system retrieves available VR-based subscriptions.  3. The customer selects a plan and provides payment details.  4. The subscription is confirmed and activated. |
| **Alternative Flows** | The customer may choose a free trial option if available, rather than subscribing immediately. |
| **Exceptions** | If the payment fails, the system prompts the customer to retry or use another payment method. |
| **Business Rules** | BR-1: Subscription renewals must be processed automatically unless canceled by the customer. |
| **Assumptions** | Assume that 40% of customers will choose a VR-based subscription. |
| **Business Rules** | Diagnostic analysis must be completed for providing results. |
| **Assumptions** | Users can understand and interpret diagnostic results. |

## Subscription Tier Management

Table 8.2: Subscription Tier Management

|  |  |
| --- | --- |
| **Use Case ID** | M8-UC8.2 |
| **Use Case Name** | Subscription Tier Management |
| **Actors** | Primary Actor: Admin  Secondary Actors: Subscription System |
| **Description** | The system allows the admin to create, modify, and manage different subscription tiers, each with varying levels of access and benefits. |
| **Trigger** | The admin initiates the management of subscription tiers. |
| **Level** | High |
| **Preconditions** | PRE-1: The subscription system is operational.  PRE-2: The admin has the appropriate access rights. |
| **Postconditions** | POST-1: Subscription tiers are created, updated, or deleted based on admin input. |
| **Normal Flow** | 1. The admin logs into the subscription management system.  2. The system prompts the admin to create, update, or delete subscription tiers.  3. The changes are saved and made available to customers. |
| **Alternative Flows** | If the admin chooses to update an existing tier, the system prompts the admin to confirm any impacts on current subscribers. |
| **Exceptions** | If the subscription management system is unavailable, the system logs an error and prompts the admin to retry later. |
| **Business Rules** | BR-1: Each subscription tier must offer distinct benefits to customers. |
| **Assumptions** | Assume that tier changes will impact current subscribers |

## Notify Customers of Special Discounts

Table 8.3: Notify Customers of Special Discounts

|  |  |
| --- | --- |
| **Use Case ID** | M8-UC8.3 |
| **Use Case Name** | Notify Customers of Special Discounts |
| **Actors** | Primary Actor: Customer  Secondary Actors: Notification System |
| **Description** | The system sends notifications to customers regarding special discounts on subscriptions, encouraging them to upgrade or renew their plans. |
| **Trigger** | The system detects a special discount offer or campaign. |
| **Level** | Medium |
| **Preconditions** | PRE-1: The notification system is operational.  PRE-2: The customer has opted in to receive notifications. |
| **Postconditions** | POST-1: The customer receives a notification about the special discount offer. |
| **Normal Flow** | 1. The system detects an active discount campaign.  2. A notification is generated and sent to eligible customers.  3. The customer views the notification and decides whether to take advantage of the offer. |
| **Alternative Flows** | If the customer has opted out of promotional notifications, the system logs the event but does not send the message. |
| **Exceptions** | If the notification system fails, the system retries sending the message after 5 minutes. |
| **Business Rules** | BR-1: Discount notifications must be sent within the campaign period. |
| **Assumptions** | Assume that most customers will act on special discount notifications. |

## Subscription Benefits Display

Table 8.4: Subscription Benefits Display

|  |  |
| --- | --- |
| **Use Case ID** | M8-UC8.4 |
| **Use Case Name** | Subscription Benefits Display |
| **Actors** | Primary Actor: Customer  Secondary Actors: Subscription System |
| **Description** | The system displays the benefits of various subscription tiers, allowing customers to compare and select the plan that best suits their needs. |
| **Trigger** | A customer views the subscription plans page. |
| **Level** | Medium |
| **Preconditions** | PRE-1: The subscription system is integrated with the benefits module. |
| **Postconditions** | POST-1: The customer views the benefits of each subscription tier and makes a selection. |
| **Normal Flow** | 1. The customer navigates to the subscription plans page.  2. The system retrieves the benefits for each tier.  3. The customer compares the tiers and selects the most appropriate one. |
| **Alternative Flows** | If the customer is unsure about a specific plan, they can request further information via customer support. |
| **Exceptions** | If the system fails to retrieve benefits, it displays a default message and prompts the customer to try again later. |
| **Business Rules** | BR-1: Subscription benefits must be clearly outlined for each tier. |
| **Assumptions** | Assume that customers will select a plan based on the displayed benefits. |

## Subscription Metrics Analysis

Table 8.5: Subscription Metrics Analysis

|  |  |
| --- | --- |
| **Use Case ID** | M8-UC8.5 |
| **Use Case Name** | Subscription Metrics Analysis |
| **Actors** | Primary Actor: Admin  Secondary Actors: Analytics Engine |
| **Description** | The system analyzes subscription metrics such as renewals, upgrades, and cancellations to provide insights into customer behavior and subscription plan performance. |
| **Trigger** | The admin accesses the subscription analytics dashboard. |
| **Level** | Medium |
| **Preconditions** | PRE-1: The analytics engine is operational and connected to subscription data. |
| **Postconditions** | POST-1: The system provides insights into subscription metrics, helping the admin make decisions on pricing and plan offerings. |
| **Normal Flow** | 1. The admin logs into the analytics dashboard.  2. The system retrieves subscription-related data.  3. The system processes and displays insights such as renewal rates, upgrade trends, and cancellation rates. |
| **Alternative Flows** | If data for certain metrics is incomplete, the system notifies the admin and proceeds with available data. |
| **Exceptions** | If the analytics engine fails, the system logs an error and retries after 15 minutes. |
| **Business Rules** | BR-1: Subscription metrics must be refreshed daily for accurate reporting. |
| **Assumptions** | Assume that the majority of subscription data will be complete and up-to-date. |

## Automated Renewal Notifications

Table 8.6: Automated Renewal Notifications

|  |  |
| --- | --- |
| **Use Case ID** | M8-UC8.6 |
| **Use Case Name** | Automated Renewal Notifications |
| **Actors** | Primary Actor: Customer  Secondary Actors: Notification System |
| **Description** | The system automatically sends reminders to customers when their subscription is nearing expiration, encouraging them to renew their plan. |
| **Trigger** | A customer’s subscription is close to expiration. |
| **Level** | High |
| **Preconditions** | PRE-1: The notification system is operational.  PRE-2: The customer is enrolled in a subscription plan. |
| **Postconditions** | POST-1: The customer receives a renewal reminder. |
| **Normal Flow** | 1. The system detects that a customer’s subscription is nearing its expiration date.  2. A renewal reminder is generated and sent to the customer via their preferred communication channel.  3. The customer reviews the notification and proceeds with the renewal process. |
| **Alternative Flows** | If the customer has opted for auto-renewal, no manual reminder is sent. |
| **Exceptions** | If the notification system fails, the system retries sending the reminder after 5 minutes. |
| **Business Rules** | BR-1: Renewal notifications must be sent at least 7 days before the subscription expires. |
| **Assumptions** | Assume that most customers will renew their subscription upon receiving a reminder. |

## Seamless Payment System Integration

Table 8.7: Seamless Payment System Integration

|  |  |
| --- | --- |
| **Use Case ID** | M8-UC8.7 |
| **Use Case Name** | Seamless Payment System Integration |
| **Actors** | Primary Actor: Customer  Secondary Actors: Payment Gateway |
| **Description** | The system ensures that the payment process for subscription purchases and renewals is smooth and integrates with multiple payment gateways. |
| **Trigger** | A customer initiates a payment for a subscription. |
| **Level** | High |
| **Preconditions** | PRE-1: The payment gateway is integrated with the subscription system. |
| **Postconditions** | POST-1: The customer successfully completes the payment for their subscription. |
| **Normal Flow** | 1. The customer selects a subscription plan and proceeds to checkout.  2. The system integrates with the payment gateway to process the payment.  3. The payment is processed, and the subscription is activated or renewed. |
| **Alternative Flows** | If the customer’s payment fails, they are prompted to retry or use a different payment method. |
| **Exceptions** | If the payment gateway is down, the system logs an error and retries after 5 minutes. |
| **Business Rules** | BR-1: Payment transactions must be secure and comply with industry standards. |
| **Assumptions** | Assume that the majority of payments will be processed without issues. |

## 24/7 Subscriber Support

Table 8.8: 24/7 Subscriber Support

|  |  |
| --- | --- |
| **Use Case ID** | M8-UC8.8 |
| **Use Case Name** | 24/7 Subscriber Support |
| **Actors** | Primary Actor: Customer  Secondary Actors: Customer Support System |
| **Description** | The system provides round-the-clock support to subscribers for resolving issues related to subscription management, payments, or access. |
| **Trigger** | A customer contacts support for assistance with their subscription. |
| **Level** | High |
| **Preconditions** | PRE-1: The customer support system is operational and integrated with subscription data. |
| **Postconditions** | POST-1: The customer’s issue is resolved, or a support ticket is created for further assistance. |
| **Normal Flow** | 1. The customer contacts support through the provided channels (email, chat, or phone).  2. The support system retrieves the customer’s subscription details.  3. The support agent assists the customer or escalates the issue if necessary. |
| **Alternative Flows** | If the issue is not resolved immediately, the system generates a support ticket for further investigation. |
| **Exceptions** | If the support system is down, the customer is informed and provided with alternative contact methods. |
| **Business Rules** | BR-1: Subscriber issues must be resolved within 24 hours or escalated for further action. |
| **Assumptions** | Assume that most subscriber issues will be resolved within the first contact. |

## Functional Requirements (Tabular FR- Module Wise)

Functional requirements (tabular form) of all the modules are given below:

## Module 1: Profile Management

**M1-UC1: User Registration**

Table 1.1.1: Enter name

|  |  |
| --- | --- |
| **Identifier** | M1-UC1-FR1 |
| **Title** | Enter name |
| **Requirement** | User is to enter full name during registration. |
| **Source** | System Design |
| **Rationale** | Essential for information about user. |
| **Dependencies** | Internet connection, Invalid input |
| **Priority** | High |

Table 1.1.2: Enter Email

|  |  |
| --- | --- |
| **Identifier** | M1-UC1-FR2 |
| **Title** | Enter name |
| **Requirement** | User should enter the valid email address. |
| **Source** | System Design |
| **Rationale** | Email account will be verified |
| **Dependencies** | Email validation |
| **Priority** | High |

Table 1.1.3: Enter Password

|  |  |
| --- | --- |
| **Identifier** | M1-UC1-FR3 |
| **Title** | Enter password |
| **Requirement** | User will to set a secure password( of 8 characters) during registration |
| **Source** | Security Design |
| **Rationale** | Ensure the security of user profile. |
| **Dependencies** | Encryption |
| **Priority** | High |

Table 1.1.4: Confirm Password

|  |  |
| --- | --- |
| **Identifier** | M1-UC1-FR4 |
| **Title** | Confirm password |
| **Requirement** | User will to renter the password ( of 8 characters) to confirm for matches |
| **Source** | Security Design |
| **Rationale** | Confirm the password |
| **Dependencies** | Input validation |
| **Priority** | Medium |

**Table 1.1.5: Agree to Terms and Conditions**

|  |  |
| --- | --- |
| **Identifier** | M1-UC1-FR5 |
| **Title** | Agree to Terms and Conditions |
| **Requirement** | User must agree with the term and conditions to register |
| **Source** | Legal Requirement |
| **Rationale** | Ensure that suer agree with terms |
| **Dependencies** | Legal document |
| **Priority** | High |

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**M1-UC2: User Sign In**

Table 1.2.1: Enter Email for Login

|  |  |
| --- | --- |
| **Identifier** | M1-UC2-FR1 |
| **Title** | Enter Email for Login |
| **Requirement** | The user is required to enter email for verification the account exists |
| **Source** | System Design |
| **Rationale** | Identifies the account of user |
| **Dependencies** | Database |
| **Priority** | High |

Table 1.2.2: Enter Password

|  |  |
| --- | --- |
| **Identifier** | M1-UC2-FR2 |
| **Title** | Enter Password |
| **Requirement** | The system shall validate the password that is entered by user |
| **Source** | Security Design |
| **Rationale** | . System identifies the user account. |
| **Dependencies** | Database Connection |
| **Priority** | High |

Table 1.2.3: Forgot Password

|  |  |
| --- | --- |
| **Identifier** | M1-UC2-FR3 |
| **Title** | Forgot Password |
| **Requirement** | The system should have an option to recover the password of user |
| **Source** | User Experience |
| **Rationale** | Enhance accessibility |
| **Dependencies** | Email service |
| **Priority** | Medium |

Table 1.2.3: Stay logged out

|  |  |
| --- | --- |
| **Identifier** | M1-UC2-FR4 |
| **Title** | Enter Password |
| **Requirement** | The system shall validate the password that is entered by user |
| **Source** | Security Design |
| **Rationale** | System identifies the user account. |
| **Dependencies** | Database Connection |
| **Priority** | Low |

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**M1-UC3: Update profile**

Table 1.3.1: Update name

|  |  |
| --- | --- |
| **Identifier** | M1-UC3-FR1 |
| **Title** | Update name |
| **Requirement** | User should be able to update the name in profile setting. |
| **Source** | System Design |
| **Rationale** | Allow user to update the name |
| **Dependencies** | Database |
| **Priority** | Medium |

Table 1.3.2: Update email address

|  |  |
| --- | --- |
| **Identifier** | M1-UC3-FR2 |
| **Title** | Update email address |
| **Requirement** | The system shall allow the user to update the email address |
| **Source** | User Design |
| **Rationale** | Keep the user up to date |
| **Dependencies** | Email verifies |
| **Priority** | Medium |

Table 1.3.3: Update password

|  |  |
| --- | --- |
| **Identifier** | M1-UC3-FR3 |
| **Title** | Update password |
| **Requirement** | The system shall allow the user to update password |
| **Source** | Security Design |
| **Rationale** | Account to be secured. |
| **Dependencies** | Confirm from the email address that password to be update |
| **Priority** | High |

Table 1.3.4: Update Profile pic

|  |  |
| --- | --- |
| **Identifier** | M1-UC3-FR4 |
| **Title** | Update Profile pic |
| **Requirement** | The system shall allow the user to update the pic |
| **Source** | User Design |
| **Rationale** | Allows the user to update profile picture |
| **Dependencies** | none |
| **Priority** | Low |

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**M1-UC4: View Customer Profile**

Table 1.4.1: View profile

|  |  |
| --- | --- |
| **Identifier** | M1-UC4-FR1 |
| **Title** | View profile |
| **Requirement** | The system will allow user to see customers demographics |
| **Source** | System Design |
| **Rationale** | View the interaction information that system stored |
| **Dependencies** | Database |
| **Priority** | High |

Table 1.4.2: Display Customer feedback

|  |  |
| --- | --- |
| **Identifier** | M1-UC4-FR2 |
| **Title** | Display Customer feedback |
| **Requirement** | System will display the feedback. |
| **Source** | System Data |
| **Rationale** | Quality check feedback helps users understand and address any image quality issues promptly. |
| **Dependencies** | Database |
| **Priority** | medium |

Table 1.4.3: Display Shared Contact information

|  |  |
| --- | --- |
| **Identifier** | M1-UC4-FR3 |
| **Title** | Display Shared Contact information |
| **Requirement** | System will display the contact information that customer has explicitly shared |
| **Source** | System Data |
| **Rationale** | Respect the privacy of customer information |
| **Dependencies** | Database |
| **Priority** | High |

Table 1.4.4: Display Customer interaction Channels

|  |  |
| --- | --- |
| **Identifier** | M1-UC4-FR4 |
| **Title** | Display Customer interaction Channels |
| **Requirement** | System will display the platforms on which customer is and interacted |
| **Source** | System Data |
| **Rationale** | Information about customer socials |
| **Dependencies** | Database |
| **Priority** | High |

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**M1-UC5: Manage Privacy Settings**

Table 1.5.1: Set Profile Visibility

|  |  |
| --- | --- |
| **Identifier** | M1-UC5-FR1 |
| **Title** | Set Profile Visibility |
| **Requirement** | The system shall be able to control who can view their customer profile. |
| **Source** | Privacy Design |
| **Rationale** | Ensures who can see customer profile |
| **Dependencies** | - |
| **Priority** | High |

Table 1.5.2: Maintain Data Share

|  |  |
| --- | --- |
| **Identifier** | M1-UC5-FR2 |
| **Title** | Maintain Data Share |
| **Requirement** | The system shall maintain the control of data to 3rd party. |
| **Source** | Privacy Design |
| **Rationale** | Protect the user data from other interoperable system in the system. |
| **Dependencies** | Privacy control |
| **Priority** | High |

Table 1.5.3: Set Notification Settings

|  |  |
| --- | --- |
| **Identifier** | M1-UC5-FR3 |
| **Title** | Set Notification Settings |
| **Requirement** | The system will get alert notifications on basis of negative sentiments |
| **Source** | System service Experience |
| **Rationale** | System can to turn on or off the notification regarding their time |
| **Dependencies** | System preferences |
| **Priority** | Low |

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**M1-UC6: Share Profile**

Table 1.6.1: Share Profile Link

|  |  |
| --- | --- |
| **Identifier** | M1-UC6-FR1 |
| **Title** | Share Profile Link |
| **Requirement** | The system shall generate the link of the profile. |
| **Source** | User Experience |
| **Rationale** | Allow system or user to generate the link to be shared. |
| **Dependencies** | Link generation service |
| **Priority** | Medium |

Table 1.6.2: Share Profile via Email

|  |  |
| --- | --- |
| **Identifier** | M1-UC6-FR2 |
| **Title** | Share Profile via Email |
| **Requirement** | System shall allow to share the profile of data via email. |
| **Source** | User Experience |
| **Rationale** | Provide facility for sharing |
| **Dependencies** | Email service |
| **Priority** | Medium |

Table 1.5.3: Share Profile on Social Media

|  |  |
| --- | --- |
| **Identifier** | M1-UC6-FR3 |
| **Title** | Share Profile on Social Media |
| **Requirement** | The system shall allow to share the profile of customer that is public to be share among social media platform. |
| **Source** | System Design |
| **Rationale** | Share profile on social media platform will increase visibility and engagement of business |
| **Dependencies** | Social media |
| **Priority** | Low |

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**M1-UC7: Notification management**

Table 1.7.1: Real Time notifications

|  |  |
| --- | --- |
| **Identifier** | M1-UC7-FR1 |
| **Title** | Real Time notifications |
| **Requirement** | The system use AI tool to give real time notifications to management team. |
| **Source** | System |
| **Rationale** | Keep the user informed about customer sentiment. |
| **Dependencies** | Notification service |
| **Priority** | High |

Table 1.7.2: Email Notifications

|  |  |
| --- | --- |
| **Identifier** | M1-UC7-FR2 |
| **Title** | Email notifications |
| **Requirement** | The system shall provide an email notification to user regarding customer overall sentiments |
| **Source** | Communication |
| **Rationale** | Flexible to provide notification via email. |
| **Dependencies** | Email service |
| **Priority** | Medium |

Table 1.7.3: Notification Settings

|  |  |
| --- | --- |
| **Identifier** | M1-UC7-FR3 |
| **Title** | Notifications Setting |
| **Requirement** | The system will allow user to turn on or off the notifications |
| **Source** | User Experience |
| **Rationale** | Flexible to notifications. |
| **Dependencies** | User Settings |
| **Priority** | Medium |

Table 1.7.4 Notifications to Customer

|  |  |
| --- | --- |
| **Identifier** | M1-UC7-FR4 |
| **Title** | Notifications to customer |
| **Requirement** | The system set the settings to send notification over social channels or through email to loyal customer regarding discounts |
| **Source** | System Design |
| **Rationale** | Flexible to send notification to customer on analysis |
| **Dependencies** | AI tool |
| **Priority** | Medium |

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**M1-UC8: Manage Customer Profile**

Table 1.8.1: View Profile

|  |  |
| --- | --- |
| **Identifier** | M1-UC8-FR1 |
| **Title** | View Profile |
| **Requirement** | The system shall allow to view Customer profile their demographics and all data stored. |
| **Source** | System Design |
| **Rationale** | System provides an overview of customer |
| **Dependencies** | Database |
| **Priority** | Medium |

Table 1.8.1: Edit Profile

|  |  |
| --- | --- |
| **Identifier** | M1-UC8-FR1 |
| **Title** | Edit Profile |
| **Requirement** | The system shall allow to edit profile of customer |
| **Source** | System Design |
| **Rationale** | feature for account flexibility |
| **Dependencies** | - |
| **Priority** | Medium |

Table 1.8.3: Delete Profile

|  |  |
| --- | --- |
| **Identifier** | M1-UC8-FR3 |
| **Title** | Delete Profile |
| **Requirement** | The system shall allow to Delete the profile of customer |
| **Source** | System Design |
| **Rationale** | Provide right to delete data |
| **Dependencies** | Database access |
| **Priority** | Medium |

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**M1-UC9: Log out**

Table 1.9.1: Standard Log out

|  |  |
| --- | --- |
| **Identifier** | M1-UC9-FR1 |
| **Title** | Standard Log out |
| **Requirement** | The user will be able to log out of the system. |
| **Source** | System Design |
| **Rationale** | Ensures account security when not in use. |
| **Dependencies** | User interface |
| **Priority** | High |

Table 1.9.1: Automatic Logout on Time

|  |  |
| --- | --- |
| **Identifier** | M1-UC8-FR1 |
| **Title** | Automatic Logout on Time |
| **Requirement** | The system shall be automatically logout after a period |
| **Source** | System Design |
| **Rationale** | Feature of logout after a time |
| **Dependencies** | - |
| **Priority** | Medium |

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## Module 2: Customer Interaction Analysis

**M2-UC1: Data Gathering**

Table 2.1.1: Data Gathering from social media

|  |  |
| --- | --- |
| **Identifier** | M2-UC1-FR1 |
| **Title** | Data Gathering from social media |
| **Requirement** | The system would be able to collect customer data form channels |
| **Source** | System Design |
| **Rationale** | Data save from Different channels regarding customer interaction |
| **Dependencies** | API access |
| **Priority** | High |

Table 2.1.2: Data Gathering from Email

|  |  |
| --- | --- |
| **Identifier** | M2-UC1-FR2 |
| **Title** | Data Gathering from Email |
| **Requirement** | The system shall gather the data from emails |
| **Source** | Marketing Design |
| **Rationale** | Several customer interact with the system through email marketing strategy |
| **Dependencies** | Email Marketing |
| **Priority** | Medium |

Table 2.1.3: Data gathering from Web

|  |  |
| --- | --- |
| **Identifier** | M2-UC1-FR3 |
| **Title** | Data gathering from Web |
| **Requirement** | The system shall store the data of customer that interact with the system through web |
| **Source** | Web analytics |
| **Rationale** | Web traffic help store the data |
| **Dependencies** | Internet connection |
| **Priority** | Medium |

**M2-UC2: Data Analytics:**

Table 2.2.1: Analysis of interactions

|  |  |
| --- | --- |
| **Identifier** | M2-UC2-FR1 |
| **Title** | Analysis of interactions |
| **Requirement** | The system shall analyze the interaction of customer from different platform |
| **Source** | Data gathering tool |
| **Rationale** | Analyzing the data of customer. |
| **Dependencies** | Analytics tool |
| **Priority** | High |

Table 2.2.2: Customer Behavior Analysis

|  |  |
| --- | --- |
| **Identifier** | M2-UC2-FR2 |
| **Title** | Customer Behavior Analysis |
| **Requirement** | The system shall analyze the data of customer interactions and their behavior toward the services. |
| **Source** | AI tool |
| **Rationale** | AI tool help analyzing the customer interactions |
| **Dependencies** | AI tool |
| **Priority** | High |

Table 2.2.3: Analysis Report

|  |  |
| --- | --- |
| **Identifier** | M2-UC2-FR3 |
| **Title** | Analysis Report |
| **Requirement** | The system shall generate report regarding interactions of customers through different platform |
| **Source** | AI analysis |
| **Rationale** | Ai tool facilitates making report on customer interactions |
| **Dependencies** | FR1, FR2 |
| **Priority** | medium |

**M2-UC3: Customer Segmentation**

Table 2.3.1: Customer Segmentation by demographics

|  |  |
| --- | --- |
| **Identifier** | M2-UC3-FR1 |
| **Title** | Customer Segmentation by demographics |
| **Requirement** | The system shall segment the customer on the base on demographics age gender , location etc. |
| **Source** | Data segmentation |
| **Rationale** | Segmentation of data for better evaluating the customer |
| **Dependencies** | Analytics tool |
| **Priority** | High |

Table 2.3.2: Segmentation by Behavior

|  |  |
| --- | --- |
| **Identifier** | M2-UC3-FR2 |
| **Title** | Segmentation by Behavior |
| **Requirement** | The system shall enable to segment the customer on basis of behavior that is get from different channels. |
| **Source** | Behavioral Analysis |
| **Rationale** | AI tool help segment behavior of customer |
| **Dependencies** | Analytics tool, AI tool |
| **Priority** | Medium. |

Table 2.3.3: Identifying Loyal Customer

|  |  |
| --- | --- |
| **Identifier** | M2-UC3-FR3 |
| **Title** | Identifying Loyal Customer |
| **Requirement** | The system shall enable to identify their loyal customer that are most interacted with system |
| **Source** | Analysis |
| **Rationale** | AI tool help identify the customer with most interactions |
| **Dependencies** | Analytics tool, AI tool |
| **Priority** | Medium. |

Table 2.3.4: Identifying High value Customer

|  |  |
| --- | --- |
| **Identifier** | M2-UC3-FR4 |
| **Title** | Identifying High value Customer |
| **Requirement** | The system shall enable to identify the customer and segment that most subscribed the service of business and most frequently purchased. |
| **Source** | Revenue Analysis |
| **Rationale** | Identifying the high-level customer offer customized rewards |
| **Dependencies** | Analytics tool, AI tool |
| **Priority** | Medium. |

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**M2-UC4: Data Storage for Decision Making**

Table 2.4.1: Analyze Data Storage

|  |  |
| --- | --- |
| **Identifier** | M2-UC4-FR1 |
| **Title** | Analyze Store data for long term use and making decisions. |
| **Requirement** | The system shall perform analyzing on the stored data |
| **Source** | Database Design |
| **Rationale** | Analyzation on stored data for decisions |
| **Dependencies** | Database |
| **Priority** | High. |

Table 2.4.2: Retrieve Insights

|  |  |
| --- | --- |
| **Identifier** | M2-UC4-FR2 |
| **Title** | Data is retrieved from database to get useful insights |
| **Requirement** | The system shall get insights from data using AI tool . |
| **Source** | AI tool |
| **Rationale** | Ai help analyzing useful insights. |
| **Dependencies** | FR1 |
| **Priority** | Medium |

Table 2.4.3: Back Up of data

|  |  |
| --- | --- |
| **Identifier** | M2-UC4-FR3 |
| **Title** | Back Up of data |
| **Requirement** | The system shall save the copy of data that if data got loss then data can be retrieved from backup for analyzing and getting insights. |
| **Source** | Data Management |
| **Rationale** | Data backups ensure the life of a system |
| **Dependencies** | FR-1,2 |
| **Priority** | High |

**M2-UC5: Behavior tracking**

Table 2.5.1: Customer Interaction Activity

|  |  |
| --- | --- |
| **Identifier** | M2-UC5-FR1 |
| **Title** | Customer Interaction Activity |
| **Requirement** | The system shall track the customer interaction activity to identify the behavior |
| **Source** | Database |
| **Rationale** | Real-time preprocessing allows for immediate analysis of customer behavior through interaction |
| **Dependencies** | Internet Connection |
| **Priority** | High |

Table 2.5.2: Monitor Interest

|  |  |
| --- | --- |
| **Identifier** | M2-UC5-FR2 |
| **Title** | Monitor Interest |
| **Requirement** | The system shall use AI tool to monitor customers interest in services or products |
| **Source** | Behavior Analytics |
| **Rationale** | Monitoring interest using Ai algorithms for to better customer experience and personalized recommendations. |
| **Dependencies** | FR-1 |
| **Priority** | Medium |

Table 2.5.3: Identifying Frequent Customer

|  |  |
| --- | --- |
| **Identifier** | M2-UC5-FR3 |
| **Title** | Identifying Frequent Customer/Visitor |
| **Requirement** | The system shall analyze from data that what people visit more often the organization for services |
| **Source** | Ai tool |
| **Rationale** | Frequent customer will targeted with marketing strategies and offers |
| **Dependencies** | FR-1 |
| **Priority** | Medium |

**M2-UC6: Recommendations**

Table 2.6.1: Recommend Similar Product

|  |  |
| --- | --- |
| **Identifier** | M2-UC6-FR1 |
| **Title** | Recommend Similar Product |
| **Requirement** | The system shall suggest customer with its interest based product in targeted marketing to make conversions. |
| **Source** | Product Analysis |
| **Rationale** | Help customer display interested product for better experience and conversions |
| **Dependencies** | - |
| **Priority** | Medium |

Table 2.6.2: Personalized Product

|  |  |
| --- | --- |
| **Identifier** | M2-UC6-FR3 |
| **Title** | Personalized Product |
| **Requirement** | The system shall give personalized experience to customer on the base of their area of interest that analyze from data interactions. |
| **Source** | Recommendation Engine |
| **Rationale** | Increase sales |
| **Dependencies** | User data |
| **Priority** | Medium |

Table 2.6.3: Context Based Recommendations

|  |  |
| --- | --- |
| **Identifier** | M2-UC6-FR3 |
| **Title** | Context Based Recommendation |
| **Requirement** | The system shall generate recommendation on the base of demographics such as location or demographics. |
| **Source** | Data Analysis |
| **Rationale** | Segmentation context recommendation using algorithm like sale targeting on specific area location customers |
| **Dependencies** | Geographic location |
| **Priority** | Medium |

**M2-UC7: Opportunity Identification**

Table 2.7.1: Identify Trends

|  |  |
| --- | --- |
| **Identifier** | M2-UC7-FR1 |
| **Title** | Identify Trends |
| **Requirement** | The system shall analyze which product is getting sold most. |
| **Source** | User story |
| **Rationale** | AI algorithm will help analyzing the product or service that is most trend among customer |
| **Dependencies** | - |
| **Priority** | High |

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## Module 3: Personalization

**M3-UC1: Personalized Product Recommendations**

Table 3.1.1: Display personalized Product Recommendations

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Display Personalized Product Recommendations |
| **Requirement** | The system shall display personalized product recommendations based on the customer’s purchase history and preferences. |
| **Source** | System Design Team |
| **Rationale** | Personalized recommendations increase customer engagement and sales conversion. |
| **Business Rule** | BR-1: Only products that are in stock should be recommended. |
| **Dependencies** | M3-UC3 (Customizable User Preferences) |
| **Priority** | High |

Table 3.1.2: Update Product Recommenfations

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Update Product Recommendations |
| **Requirement** | The system shall update product recommendations in real-time as customer preferences or purchase history changes. |
| **Source** | System Design Team |
| **Rationale** | Real-time updates ensure relevant recommendations and increase customer satisfaction. |
| **Business Rule** | BR-2: Recommendations should reflect the most recent customer activity. |
| **Dependencies** | M3-UC7 (Dynamic Web Content Display) |
| **Priority** | High |

**M3-UC2: Real-Time Personalization Offers**

Table 3.2.1: Real-Time offers

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Generate Real-Time Offers |
| **Requirement** | The system shall generate real-time personalized offers based on the customer’s current browsing behavior. |
| **Source** | Marketing Team |
| **Rationale** | Real-time offers encourage immediate purchase decisions. |
| **Business Rule** | BR-3: Offers should only apply to available products. |
| **Dependencies** | M3-UC5 (Guided Item Navigation) |
| **Priority** | High |

Table 3.2.2: Display Personalized Offers

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Display Personalized Offers |
| **Requirement** | The system shall display personalized offers in the customer's account during their browsing session. |
| **Source** | Marketing Team |
| **Rationale** | Personalized offers increase engagement and drive sales conversions. |
| **Business Rule** | BR-4: Offers should expire at the end of the browsing session. |
| **Dependencies** | M3-UC1 (Personalized Product Recommendations) |
| **Priority** | Medium |

**M3-UC3: Customizable User Preferences**

Table 3.3.1: Set Preferences

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Allow Users to Set Preferences |
| **Requirement** | The system shall allow users to customize their preferences for product recommendations, including categories and brands. |
| **Source** | User Research |
| **Rationale** | Allowing users to customize preferences increases user satisfaction and the relevance of recommendations. |
| **Business Rule** | BR-5: User preferences must be saved and stored securely. |
| **Dependencies** | M3-UC1 (Personalized Product Recommendations) |
| **Priority** | High |

Table 3.3.2: Save Preferences

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Save User Preferences |
| **Requirement** | The system shall save user preferences in their account for future recommendation adjustments. |
| **Source** | User Research |
| **Rationale** | Storing preferences ensures consistency in personalized experiences. |
| **Business Rule** | BR-6: Preferences must be easily editable by users. |
| **Dependencies** | M3-UC7 (Dynamic Web Content Display) |
| **Priority** | High |

**M3-UC4: Personalized Email Campaigns**

Table 3.4.1: Personalized Email

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Generate Personalized Emails |
| **Requirement** | The system shall generate personalized email campaigns based on user behavior and preferences. |
| **Source** | Marketing Team |
| **Rationale** | Personalized emails improve open rates and engagement with the platform. |
| **Business Rule** | BR-7: Emails must comply with anti-spam regulations. |
| **Dependencies** | M3-UC3 (Customizable User Preferences) |
| **Priority** | High |

Table 3.4.2: Send Personalized Offers (email)

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Send Personalized Offers via Email |
| **Requirement** | The system shall send personalized offers to users through email, based on their preferences and activity. |
| **Source** | Marketing Team |
| **Rationale** | Sending personalized offers via email increases the chances of engagement and purchases. |
| **Business Rule** | BR-8: Offers should reflect the user’s most recent activity. |
| **Dependencies** | M3-UC2 (Real-Time Personalization Offers) |
| **Priority** | Medium |

**M3-UC5: Guided Item Navigation**

Table 3.5.1: Guided Navigation

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Provide Guided Navigation |
| **Requirement** | The system shall guide users to relevant products based on their search terms and preferences. |
| **Source** | User Research |
| **Rationale** | Guided navigation helps users find relevant products faster, improving user experience. |
| **Business Rule** | BR-9: Categories must reflect user preferences and available stock. |
| **Dependencies** | M3-UC3 (Customizable User Preferences) |
| **Priority** | Medium |

Table 3.5.2: Update Navigation

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Update Navigation Options |
| **Requirement** | The system shall update navigation options in real-time based on user interaction. |
| **Source** | User Research |
| **Rationale** | Real-time updates provide more relevant suggestions to the user. |
| **Business Rule** | BR-10: Options must be updated without page refreshes. |
| **Dependencies** | M3-UC1 (Personalized Product Recommendations) |
| **Priority** | Medium |

**M3-UC6: Predictive Personalization**

Table 3.6.1: Predicative Analysis

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Use Predictive Analytics for Personalization |
| **Requirement** | The system shall use predictive analytics to recommend products based on the user’s previous interactions and trends. |
| **Source** | Data Analytics Team |
| **Rationale** | Predictive analytics improve recommendation accuracy and user satisfaction. |
| **Business Rule** | BR-11: Predictions must be based on recent user behavior. |
| **Dependencies** | M3-UC1 (Personalized Product Recommendations) |
| **Priority** | High |

Table 3.6.2: Update Prediction Real-time

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Update Predictions in Real-Time |
| **Requirement** | The system shall update predictive personalization suggestions in real-time as the user interacts with the platform. |
| **Source** | Data Analytics Team |
| **Rationale** | Real-time updates provide more accurate predictions, increasing user engagement. |
| **Business Rule** | BR-12: Predictions must be adjusted as soon as new user behavior is detected. |
| **Dependencies** | M3-UC7 (Dynamic Web Content Display) |
| **Priority** | High |

**M3-UC7: Dynamic Web Content Display**

Table 3.7.1: Display Dynamic Web Content by Prefence

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Display Dynamic Web Content Based on Preferences |
| **Requirement** | The system shall dynamically display content based on user preferences and interactions on the platform. |
| **Source** | System Design Team |
| **Rationale** | Dynamic content provides a more personalized experience, increasing engagement. |
| **Business Rule** | BR-13: Content must be updated without interrupting the user experience. |
| **Dependencies** | M3-UC3 (Customizable User Preferences) |
| **Priority** | High |

Table 3.7.2: Real Time Update of DMC

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Real-Time Update of Dynamic Content |
| **Requirement** | The system shall update dynamic content in real-time as user preferences or behaviors change. |
| **Source** | System Design Team |
| **Rationale** | Real-time updates ensure that the content remains relevant to the user. |
| **Business Rule** | BR-14: Updates must be seamless and non-disruptive to the user experience. |
| **Dependencies** | M3-UC1 (Personalized Product Recommendations) |
| **Priority** | Medium |

M3-UC8: Cross-Selling Recommendations

Table 3.8.1: Display Recommendations

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Display Cross-Selling Recommendations |
| **Requirement** | The system shall recommend complementary products based on the user’s current selections in their cart. |
| **Source** | Marketing Team |
| **Rationale** | Cross-selling increases average order value and sales conversion rates. |
| **Business Rule** | BR-15: Only relevant products should be recommended for cross-selling. |
| **Dependencies** | M3-UC1 (Personalized Product Recommendations) |
| **Priority** | High |

Table 3.8.2: Update Cross-selling Recommendations

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Update Cross-Selling Recommendations in Real-Time |
| **Requirement** | The system shall update cross-selling recommendations in real-time as users add or remove items from their cart. |
| **Source** | Marketing Team |
| **Rationale** | Real-time updates increase the relevance of cross-selling suggestions. |
| **Business Rule** | BR-16: Cross-selling recommendations must adapt to cart changes. |
| **Dependencies** | M3-UC7 (Dynamic Web Content Display) |
| **Priority** | Medium |

## Module 4: Performance Metrics Dashboard

**M4-UC1: KPIs Monitoring**

**Table 4:1:1 Display Key Performance Indicators (KPIs)**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Display Key Performance Indicators (KPIs) |
| **Requirement** | The system shall display real-time KPIs such as NPS (Net Promoter Score) and CSAT (Customer Satisfaction Score) on the performance dashboard. |
| **Source** | Admin Team |
| **Rationale** | Real-time monitoring of KPIs helps track customer satisfaction and identify areas for improvement. |
| **Business Rule** | BR-1: KPI data should be updated in real-time for accuracy. |
| **Dependencies** | M4-UC5 (Metrics Comparison Over Time) |
| **Priority** | High |

**Table 4:1:2 Update KPIs Automatically**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Update KPIs Automatically |
| **Requirement** | The system shall automatically update KPIs on the dashboard based on incoming data from various customer interaction points. |
| **Source** | Admin Team |
| **Rationale** | Automated updates ensure that admins have access to the most current data without manual intervention. |
| **Business Rule** | BR-2: KPI data updates must be continuous, with no more than a 1-minute delay. |
| **Dependencies** | M4-UC6 (Areas for Improvement Identification) |
| **Priority** | High |

**M4-UC2: Customer Retention Tracking**

**Table 4:2:1 Track Customer Retention Rates**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Track Customer Retention Rates |
| **Requirement** | The system shall track customer retention rates and display the retention data on the dashboard for analysis. |
| **Source** | Admin Team |
| **Rationale** | Tracking retention rates allows the organization to evaluate customer loyalty and take necessary actions to reduce churn. |
| **Business Rule** | BR-3: Retention data must be updated daily. |
| **Dependencies** | M4-UC4 (Churn Rate Analysis) |
| **Priority** | Medium |

**Table 4:2:2 Generate Retention Reports**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Generate Retention Reports |
| **Requirement** | The system shall generate weekly reports on customer retention trends and provide insights on potential reasons for customer churn. |
| **Source** | Admin Team |
| **Rationale** | Regular retention reports provide insights that help improve customer retention strategies. |
| **Business Rule** | BR-4: Retention reports must cover a minimum of one year of data. |
| **Dependencies** | M4-UC7 (Performance Reports Generation) |
| **Priority** | Medium |

**M4-UC3: Real-Time Performance Monitoring**

**Table 4:3:1 Monitor Customer Satisfaction in Real-Time**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Monitor Customer Satisfaction in Real-Time |
| **Requirement** | The system shall provide real-time monitoring of customer satisfaction metrics such as CSAT, allowing immediate responses to declining scores. |
| **Source** | Customer Experience Team |
| **Rationale** | Real-time monitoring allows timely identification of customer issues and faster responses to improve satisfaction. |
| **Business Rule** | BR-5: Customer satisfaction data must be updated at least every 5 minutes. |
| **Dependencies** | M4-UC1 (KPIs Monitoring) |
| **Priority** | High |

**Table 4:3:2 Monitor Operational Efficiency**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Monitor Operational Efficiency |
| **Requirement** | The system shall monitor operational efficiency in real-time, tracking response times and issue resolution times. |
| **Source** | Operations Team |
| **Rationale** | Monitoring efficiency metrics ensures operational goals are met and identifies bottlenecks in the process. |
| **Business Rule** | BR-6: Operational metrics must reflect current system status. |
| **Dependencies** | M4-UC6 (Areas for Improvement Identification) |
| **Priority** | Medium |

**M4-UC4: Churn Rate Analysis**

**Table 4:4:1 Analyze Churn Rates**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Analyze Churn Rates |
| **Requirement** | The system shall analyze customer churn rates and display trends over time to help the business identify the reasons for customer churn. |
| **Source** | Admin Team |
| **Rationale** | Understanding churn rates enables the organization to implement strategies to reduce customer loss. |
| **Business Rule** | BR-7: Churn data should be analyzed monthly. |
| **Dependencies** | M4-UC2 (Customer Retention Tracking) |
| **Priority** | Medium |

**Table 4:4:2 Identify Churn Causes**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Identify Churn Causes |
| **Requirement** | The system shall identify potential causes for churn by analyzing customer interaction and satisfaction data. |
| **Source** | Customer Experience Team |
| **Rationale** | Identifying the root causes of churn helps improve retention strategies and customer experience. |
| **Business Rule** | BR-8: Churn data should consider multiple factors, including customer interaction history and support requests. |
| **Dependencies** | M4-UC6 (Areas for Improvement Identification) |
| **Priority** | High |

**M4-UC5: Metrics Comparison Over Time**

**Table 4:5:1 Compare Performance Metrics Across Time Periods**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Compare Performance Metrics Across Time Periods |
| **Requirement** | The system shall allow admins to compare performance metrics, such as customer satisfaction and retention rates, over different time periods. |
| **Source** | Admin Team |
| **Rationale** | Comparing performance over time helps identify trends and improvements in key areas. |
| **Business Rule** | BR-9: Metrics comparisons should include at least one year of historical data. |
| **Dependencies** | M4-UC1 (KPIs Monitoring) |
| **Priority** | Medium |

**Table 4:5:2 Provide Historical Data Visualization**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Provide Historical Data Visualization |
| **Requirement** | The system shall provide visual representations of historical performance data to aid in trend analysis. |
| **Source** | Admin Team |
| **Rationale** | Visualizations make it easier for users to spot trends and make data-driven decisions. |
| **Business Rule** | BR-10: Historical data must be visualized using graphs, charts, or tables. |
| **Dependencies** | M4-UC7 (Performance Reports Generation) |
| **Priority** | Medium |

**M4-UC6: Areas for Improvement Identification**

**Table 4:6:1 Identify Areas for Customer Experience Improvement**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Identify Areas for Customer Experience Improvement |
| **Requirement** | The system shall identify areas for improvement in customer experience based on performance metrics and customer satisfaction data. |
| **Source** | Customer Experience Team |
| **Rationale** | Identifying areas for improvement helps the organization make targeted enhancements to improve overall customer satisfaction. |
| **Business Rule** | BR-11: Improvement areas must be derived from CSAT and NPS data. |
| **Dependencies** | M4-UC1 (KPIs Monitoring) |
| **Priority** | High |

**Table 4:6:2 Provide Actionable Insights**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Provide Actionable Insights |
| **Requirement** | The system shall provide actionable insights for operational improvements, based on real-time performance metrics. |
| **Source** | Operations Team |
| **Rationale** | Actionable insights help management take immediate steps to address performance issues. |
| **Business Rule** | BR-12: Insights should include recommendations for process improvements. |
| **Dependencies** | M4-UC3 (Real-Time Performance Monitoring) |
| **Priority** | High |

**M4-UC7: Performance Reports Generation**

**Table 4:7:1 Generate Detailed Performance Reports**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Generate Detailed Performance Reports |
| **Requirement** | The system shall generate detailed performance reports, including customer satisfaction metrics, retention rates, and churn analysis. |
| **Source** | Admin Team |
| **Rationale** | Performance reports provide a comprehensive overview of system effectiveness and customer satisfaction. |
| **Business Rule** | BR-13: Reports must cover at least a 30-day period. |
| **Dependencies** | M4-UC1 (KPIs Monitoring) |
| **Priority** | High |

**Table 4:7:2 Provide Customizable Report Options**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Provide Customizable Report Options |
| **Requirement** | The system shall allow admins to customize the performance reports by selecting specific metrics and time periods. |
| **Source** | Admin Team |
| **Rationale** | Customizable reports allow admins to focus on specific areas of interest for analysis. |
| **Business Rule** | BR-14: Reports must be exportable in PDF and CSV formats. |
| **Dependencies** | M4-UC5 (Metrics Comparison Over Time) |
| **Priority** | Medium |

**M4-UC8: Dashboard Visualization of Metrics**

**Table 4:8:1 Visualize Performance Metrics on the Dashboard**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Visualize Performance Metrics on the Dashboard |
| **Requirement** | The system shall display performance metrics, such as customer satisfaction scores and churn rates, in a visual format on the dashboard. |
| **Source** | Admin Team |
| **Rationale** | Visual representation of data makes it easier for admins to quickly interpret performance metrics. |
| **Business Rule** | BR-15: Metrics must be displayed using graphs and charts for easy understanding. |
| **Dependencies** | M4-UC1 (KPIs Monitoring) |
| **Priority** | High |

**Table 4:8:2 Update Dashboard Visuals in Real-Time**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Update Dashboard Visuals in Real-Time |
| **Requirement** | The system shall update the visual representations of performance metrics in real-time as new data is received. |
| **Source** | Admin Team |
| **Rationale** | Real-time visual updates ensure that the latest performance data is always displayed on the dashboard. |
| **Business Rule** | BR-16: Real-time updates must occur within a 1-minute interval. |
| **Dependencies** | M4-UC3 (Real-Time Performance Monitoring) |
| **Priority** | High |

## Module 5: Sentimental Analysis

**M3-UC1: Feedback Gathering**

Table 3.1.1: Feedback Gathering from social media

|  |  |
| --- | --- |
| **Identifier** | M3-UC1-FR1 |
| **Title** | Feedback Gathering from social media |
| **Requirement** | Data Gathering from social media |
| **Source** | The system would be able to collect customer data form channels |
| **Rationale** | System Design |
| **Dependencies** | Data save from Different channels regarding customer interaction |
| **Priority** | API access |
|  | High |

Table 3.1.2: Data Gathering from Email

|  |  |
| --- | --- |
| **Identifier** | M3-UC1-FR2 |
| **Title** | Data Gathering from Email |
| **Requirement** | The system shall gather the data from emails |
| **Source** | Marketing Design |
| **Rationale** | Several customer interact with the system through email marketing strategy |
| **Dependencies** | Email Marketing |
| **Priority** | Medium |

Table 3.1.3: Manual Data Entry

|  |  |
| --- | --- |
| **Identifier** | M3-UC1-FR3 |
| **Title** | Manual Data Entry |
| **Requirement** | The system shall to manually enter the feedback of user from different channels |
| **Source** | User story |
| **Rationale** | Enable feedback entry from different channels |
| **Dependencies** | M3-UC1-FR1,FR2 |
| **Priority** | medium |

**M3-UC2: Keyword Extraction**

Table 3.2.1: Extract keywords

|  |  |
| --- | --- |
| **Identifier** | M3-UC2-FR1 |
| **Title** | Extract keyword |
| **Requirement** | The system shall use AI tools to extract the matching keyword or most common keyword |
| **Source** | User story |
| **Rationale** | Ai tool in extracting keywords to better analyze customer |
| **Dependencies** | NLP processing |
| **Priority** | High. |

Table 3.2.2: Keyword Trends Analysis

|  |  |
| --- | --- |
| **Identifier** | M3-UC2-FR2 |
| **Title** | Keyword Trends Analysis |
| **Requirement** | The system shall analyze the most frequently used keywords to analyze what most frequent issue they are encountering customer or the service they liking |
| **Source** | AI analysis |
| **Rationale** | Help analyzing the trend from customer feedbacks |
| **Dependencies** | - |
| **Priority** | Medium. |

Table 3.2.3 Frequent Keyword

|  |  |
| --- | --- |
| **Identifier** | M3-UC2-FR3 |
| **Title** | Frequent Keyword |
| **Requirement** | The system shall find the most frequent words that are used by customer that better provide information about their feedback to service or products |
| **Source** | Ai Analysis |
| **Rationale** | Help analyzing the most frequently used Keywords |
| **Dependencies** | - |
| **Priority** | medium |

**M3-UC3: Sentimental Classification**

Table 3.2.1: Sentiment Feedback Classification

|  |  |
| --- | --- |
| **Identifier** | M3-UC2-FR1 |
| **Title** | Sentiment Classification |
| **Requirement** | The system shall use AI tools to classify the sentiments and categorized |
| **Source** | User story |
| **Rationale** | Ai tool in classifying the sentiments as postive, negative, netural |
| **Dependencies** | NLP processing |
| **Priority** | High. |

Table 3.2.2: Sentiment Score Calculation

|  |  |
| --- | --- |
| **Identifier** | M3-UC2-FR2 |
| **Title** | Sentiment Score Calculation |
| **Requirement** | The system shall find sentiment score for each categorized of sentiment classified |
| **Source** | Business Analysis |
| **Rationale** | Help analyzing the sentiment on basis of score.. |
| **Dependencies** | - |
| **Priority** | Medium. |

Table 3.2.3 Sentiment Automated Response

|  |  |
| --- | --- |
| **Identifier** | M3-UC2-FR3 |
| **Title** | Sentiment Automated Response |
| **Requirement** | The system shall find response to the critical or negative feedbacks on real time to better the customer service |
| **Source** | Ai Analysis |
| **Rationale** | Help analyzing the negative sentiment and response on real time addressing their issue |
| **Dependencies** | - |
| **Priority** | High |

**M3-UC4: Real time Monitoring**

Table 3.4.1: Real time monitoring

|  |  |
| --- | --- |
| **Identifier** | M3-UC4-FR1 |
| **Title** | Real time monitoring |
| **Requirement** | The system shall allow Ai tool to live analyse the sentiment of users. |
| **Source** | User story |
| **Rationale** | Enable the real time monitoring of interactions. |
| **Dependencies** | - |
| **Priority** | high |

Table 3.4.2: Fresh Data

|  |  |
| --- | --- |
| **Identifier** | M3-UC4-FR2 |
| **Title** | Automatic Data Refresh |
| **Requirement** | The system shall refresh sentimental data over passing data |
| **Source** | Technical requirement |
| **Rationale** | Refresh the data of sentiments over time for better analysis and decision making |
| **Dependencies** | - |
| **Priority** | Medium. |

**M3-UC5: Alert Notification**

Table 3.5.1: Generate Alert on negative customer

|  |  |
| --- | --- |
| **Identifier** | M3-UC5-FR1 |
| **Title** | Generate Alert on negative customer |
| **Requirement** | The system shall generate alerts when negative sentiments score is getting higher |
| **Source** | System Analysis |
| **Rationale** | Allows for sending notifications on time. |
| **Dependencies** | Alert System |
| **Priority** | high |

Table 3.5.2: Customized Alert

|  |  |
| --- | --- |
| **Identifier** | M3-UC5-FR2 |
| **Title** | Customized Alert |
| **Requirement** | The system shall maintain the user to set the limit after which alert notification will be generated |
| **Source** | Technical requirement |
| **Rationale** | Provide flexibility in how and when user to be notified |
| **Dependencies** | FR1 |
| **Priority** | High |

**M3-UC6: Perception trend**

Table 3.6.1: Analyze trend over time

|  |  |
| --- | --- |
| **Identifier** | M3-UC6-FR1 |
| **Title** | Analyze trend over time |
| **Requirement** | The system shall ensure perception of customer about brand on data |
| **Source** | Technical requirement |
| **Rationale** | Helps to identify current perception about customer. |
| **Dependencies** | Database |
| **Priority** | High |

Table 3.6.2: Visualize Trend Data

|  |  |
| --- | --- |
| **Identifier** | M3-UC6-FR2 |
| **Title** | Visualize Trend Data |
| **Requirement** | The system shall provide graphical presentation over trends. |
| **Source** | Technical requirement |
| **Rationale** | Present the visual representation of people interests and trends over time |
| **Dependencies** | Visualization tool |
| **Priority** | medium |

**M3-UC7: Insight Generation**

Table 3.7.1 Generate Actionable Insights

|  |  |
| --- | --- |
| **Identifier** | M3-UC7-FR1 |
| **Title** | Generate Actionable Insights |
| **Requirement** | The system shall allow user to generate the actionable insights based on the sentimental data that is stored from the different channels |
| **Source** | User story |
| **Rationale** | Ai tool for analyzing the whole journey of customer make insights. |
| **Dependencies** | M3-UC6-FR1 |
| **Priority** | Medium |

Table 3.7.2: Insights on base of Age

|  |  |
| --- | --- |
| **Identifier** | M3-UC7-FR2 |
| **Title** | Insights on base of Age |
| **Requirement** | The system shall provide feature to analyze the age group of people that are interested in their service or interacted |
| **Source** | System Design |
| **Rationale** | Flexibility for to provide insights to age group of people that interacted with product |
| **Dependencies** | AI engine |
| **Priority** | Medium |

Table 3.7.3: Insights on base of area

|  |  |
| --- | --- |
| **Identifier** | M3-UC7-FR3 |
| **Title** | Insights on base of Age |
| **Requirement** | The system shall provide feature to analyze the geographical region of people that are interested in their service or interacted |
| **Source** | System Design |
| **Rationale** | Flexibility for to provide insights of location of people that interacted with product |
| **Dependencies** | AI engine |
| **Priority** | Medium |

**M3-UC8: Report Sentiments**

Table 3.8.1: Report of insight

|  |  |
| --- | --- |
| **Identifier** | M3-UC7-FR2 |
| **Title** | Report of Insights |
| **Requirement** | The system shall provide feature to create a report that is specifying the insight that are analyzed |
| **Source** | System Design |
| **Rationale** | Flexibility for providing the insights in presentable form |
| **Dependencies** | M3-UC6-FR2 |
| **Priority** | High |

Table 3.8.2: Comparative Sentiment report

|  |  |
| --- | --- |
| **Identifier** | M3-UC8-FR2 |
| **Title** | Comparative Sentiment report |
| **Requirement** | The system shall comparative sentiment analysis report to show changes in customer sentiments over time. |
| **Source** | User story |
| **Rationale** | Help identifying customer behavior over time. |
| **Dependencies** | M3-UC8-FR1 |
| **Priority** | Medium |

Table 3.8.3: Automated Insight Generation

|  |  |
| --- | --- |
| **Identifier** | M3-UC8-FR3 |
| **Title** | Automated Insight Generation |
| **Requirement** | The system shall automatically generate actionable insight for analysis. |
| **Source** | System design |
| **Rationale** | Providing insights on customer sentiments. |
| **Dependencies** | M3-UC8-FR1 |
| **Priority** | Medium |

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## Module 6: Customer Journey Map

**M4-UC1: Create Journey map**

Table 4.1.1: Create User journey map

|  |  |
| --- | --- |
| **Identifier** | M4-UC1-FR1 |
| **Title** | Create User journey map |
| **Requirement** | The system shall allow use to create a new journey map by providing the template. |
| **Source** | User Story |
| **Rationale** | Flexible to design journey map on specific needs |
| **Dependencies** | Ui design |
| **Priority** | High. |

Table 4.1.2: Include Touchpoints

|  |  |
| --- | --- |
| **Identifier** | M4-UC1-FR2 |
| **Title** | Include Touchpoints |
| **Requirement** | The system shall allow user to add touchpoints, phases and interactions to journey map |
| **Source** | Technical requirement |
| **Rationale** | Help to visualize the customer interaction at different stages of their journey. |
| **Dependencies** | Data input forms |
| **Priority** | Medium |

Table 4.1.3: Custom Journey map Elements

|  |  |
| --- | --- |
| **Identifier** | M4-UC1-FR3 |
| **Title** | Customize journey map Elements |
| **Requirement** | The system shall provide options for customizing journey map elements as table, icons ,labels, and colors |
| **Source** | User story |
| **Rationale** | Customizing feature enhancing the clarity of website |
| **Dependencies** | Visualization tool |
| **Priority** | Medium |

**M4-UC2: Identifying Map**

Table 4.2.1: Automatic Journey identification

|  |  |
| --- | --- |
| **Identifier** | M4-UC2-FR1 |
| **Title** | Allow users to select specific features for analysis |
| **Requirement** | The system shall automatically identify and suggest journey map-based customer interactions |
| **Source** | User story |
| **Rationale** | Feature for generating the map by process the data |
| **Dependencies** | - |
| **Priority** | medium |

Table 4.2.2: Journey map Recommendations

|  |  |
| --- | --- |
| **Identifier** | M4-UC2-FR2 |
| **Title** | Journey map Recommendations |
| **Requirement** | The system shall enable to recommend different journey map based on their need |
| **Source** | User story |
| **Rationale** | Feature to facilitate customer to identify the problem |
| **Dependencies** | Templates libarary |
| **Priority** | Medium. |

**M4-UC3 Identify pain points**

Table 4.2.2: Pain point detection

|  |  |
| --- | --- |
| **Identifier** | M4-UC2-FR2 |
| **Title** | Pain point detection |
| **Requirement** | The system shall enable to classify the pain points of customers and analyze |
| **Source** | User story |
| **Rationale** | Feature to facilitate customer to identify the problem |
| **Dependencies** | FR-1 |
| **Priority** | Medium. |

Table 4.3.2: Visualization of Pain points on journey map

|  |  |
| --- | --- |
| **Identifier** | M4-UC3-FR2 |
| **Title** | Visualization of Pain points on journey map |
| **Requirement** | The system shall display the pain points of customers on journey map to make them easy identifiable. |
| **Source** | User Requirement |
| **Rationale** | Allow the stakeholders to quickly understand the problem areas in customer journey |
| **Dependencies** | Visualization tool |
| **Priority** | Medium |

Table 4.3.3: Integrate feedback

|  |  |
| --- | --- |
| **Identifier** | M4-UC3-FR3 |
| **Title** | Integrate feedback |
| **Requirement** | The system shall integrate the feedback to display on journey map. |
| **Source** | User Requirement |
| **Rationale** | Ensure the pain points to be identified on customer journey map |
| **Dependencies** | Database |
| **Priority** | Medium |

**M4-UC4: Share Journey Map**

Table 4.4.1: Share Link

|  |  |
| --- | --- |
| **Identifier** | M4-UC4-FR1 |
| **Title** | Share Link |
| **Requirement** | The system shall generate the link of the customer journey map. |
| **Source** | User Experience |
| **Rationale** | Allow system or user to generate the link to be shared. |
| **Dependencies** | Link generation service |
| **Priority** | Medium |

Table4.4..2: Share via Email

|  |  |
| --- | --- |
| **Identifier** | M4-UC4-FR2 |
| **Title** | Share via Email |
| **Requirement** | System shall allow to share the journey map via email. |
| **Source** | User Experience |
| **Rationale** | Provide facility for sharing via email |
| **Dependencies** | Email service |
| **Priority** | Medium |

Table 4.4..3: Share via Social Media

|  |  |
| --- | --- |
| **Identifier** | M4-UC4-FR3 |
| **Title** | Share on social media |
| **Requirement** | The system shall allow to share the customer journey map that is public to be share among social media platform. |
| **Source** | System Design |
| **Rationale** | Share profile on social media platform will increase visibility and engagement of business |
| **Dependencies** | Social media |
| **Priority** | Low |

**M4-UC5: Update Journey Map**

Table 4.5.1: Update Journey map

|  |  |
| --- | --- |
| **Identifier** | M4-UC5-FR1 |
| **Title** | Update Journey map |
| **Requirement** | The system shall enable the user to edit the journey map with refreshing the data |
| **Source** | User story |
| **Rationale** | Keep journey map up to date with latest information and changes |
| **Dependencies** | UI design |
| **Priority** | High |

Table 4.5.2: Audit Journey map

|  |  |
| --- | --- |
| **Identifier** | M4-UC5-FR2 |
| **Title** | Audit Journey map |
| **Requirement** | The system shall provide an audit of all updates when there perform a changing in the system. |
| **Source** | User story |
| **Rationale** | Provide the record of user updates on customer journey map. |
| **Dependencies** | Audit functionality |
| **Priority** | Medium. |

Table 4.5.3: Version Control

|  |  |
| --- | --- |
| **Identifier** | M4-UC5-FR3 |
| **Title** | Version Control |
| **Requirement** | The system shall maintain the version control of journey map to track all changes |
| **Source** | User story |
| **Rationale** | Ensure to write down all the changes and to be reverted if need. |
| **Dependencies** | FR-1, 2 |
| **Priority** | Medium. |

**M4-UC6: Delete Journey Map**

Table 4.6.1: Temporary delete

|  |  |
| --- | --- |
| **Identifier** | M4-UC6-FR1 |
| **Title** | Temporary delete |
| **Requirement** | The system shall be able to delete the data temporary that will be stored in backlog for 30 days and then will permanently delete. |
| **Source** | Technical requirement |
| **Rationale** | Access to delete the journey map |
| **Dependencies** | - |
| **Priority** | high |

Table 4.6.2: Confirm delete

|  |  |
| --- | --- |
| **Identifier** | M4-UC6-FR2 |
| **Title** | Confirm delete |
| **Requirement** | The system shall allow users to delete the map and by confirming from user |
| **Source** | User story |
| **Rationale** | Confirm to delete the map instead of accidental deletion |
| **Dependencies** | User interface |
| **Priority** | Medium. |

## Module 7: Reward And Loyalty Program

**M7-UC1: Loyalty Program Creation**

**Table 7:1:1 Display Loyalty Program Options**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Display Loyalty Program Options |
| **Requirement** | The system shall display loyalty program options for customers to view and choose from. |
| **Source** | Admin Team |
| **Rationale** | Displaying loyalty programs encourages customers to participate and engage with the platform. |
| **Business Rule** | BR-1: Loyalty programs must include at least one reward tier. |
| **Dependencies** | M7-UC2 (Customer Loyalty Tracking) |
| **Priority** | High |

**Table 7:1:2 Create and Activate Loyalty Program**

|  |  |
| --- | --- |
|  |  |
| **Identifier** | FR-2 |
| **Title** | Create and Activate Loyalty Program |
| **Requirement** | The system shall allow the admin to create and activate a loyalty program, including setting reward tiers and points allocation. |
| **Source** | Admin Team |
| **Rationale** | Admins need to be able to create and activate loyalty programs to manage customer engagement. |
| **Business Rule** | BR-2: The system must ensure that loyalty programs can only be activated by authorized admins. |
| **Dependencies** | M7-UC3 (Reward Points Allocation) |
| **Priority** | High |

**M7-UC2: Customer Loyalty Tracking**

**Table 7:2:1 Track Customer Loyalty Points**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Track Customer Loyalty Points |
| **Requirement** | The system shall track customer loyalty points and display them in the customer’s account for their review. |
| **Source** | Customer Engagement Team |
| **Rationale** | Customers need to track their loyalty points to understand their reward status. |
| **Business Rule** | BR-3: Loyalty points must be updated in real-time as customer actions occur. |
| **Dependencies** | M7-UC3 (Reward Points Allocation) |
| **Priority** | High |

**Table 7:2:2 Generate Loyalty Reports**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Generate Loyalty Reports |
| **Requirement** | The system shall generate monthly loyalty reports that track customer engagement, points earned, and rewards redeemed. |
| **Source** | Admin Team |
| **Rationale** | Regular reporting ensures visibility into the performance of the loyalty program and customer engagement levels. |
| **Business Rule** | BR-4: Reports must cover at least a 12-month period. |
| **Dependencies** | M7-UC8 (Loyalty Program Integration with Sales Data) |
| **Priority** | Medium |

**M7-UC3: Reward Points Allocation**

**Table 7:3:1 Allocate Reward Points for Purchases**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Allocate Reward Points for Purchases |
| **Requirement** | The system shall allocate reward points to customers based on the value of their purchases. |
| **Source** | Sales and Marketing Team |
| **Rationale** | Allocating reward points incentivizes customers to make more purchases and engage with the loyalty program. |
| **Business Rule** | BR-5: Reward points must be proportional to the total value of the purchase. |
| **Dependencies** | M7-UC2 (Customer Loyalty Tracking) |
| **Priority** | High |

**Table 7:3:2 Remove Reward Points for Canceled Orders**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Remove Reward Points for Canceled Orders |
| **Requirement** | The system shall remove reward points from a customer’s account if their order is canceled. |
| **Source** | Sales and Marketing Team |
| **Rationale** | Points must be deducted when a transaction is reversed to prevent misuse of the loyalty program. |
| **Business Rule** | BR-6: Points should be deducted in real-time when the cancellation occurs. |
| **Dependencies** | M7-UC7 (Seamless Payment System Integration) |
| **Priority** | Medium |

**M7-UC4: Notify Customers of Loyalty Status**

**Table 7:4:1 Send Loyalty Status Notifications**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Send Loyalty Status Notifications |
| **Requirement** | The system shall send notifications to customers informing them of changes to their loyalty status, including tier upgrades or reward eligibility. |
| **Source** | Marketing Team |
| **Rationale** | Customers need to be notified about their loyalty status to encourage further engagement and reward redemption. |
| **Business Rule** | BR-7: Notifications must be sent within 24 hours of a loyalty status change. |
| **Dependencies** | M7-UC2 (Customer Loyalty Tracking) |
| **Priority** | High |

**Table 7:4:2 Send Expiry Reminders for Loyalty Points**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Send Expiry Reminders for Loyalty Points |
| **Requirement** | The system shall send reminders to customers when their loyalty points are about to expire. |
| **Source** | Marketing Team |
| **Rationale** | Expiry reminders encourage customers to use their points before they are lost, increasing engagement and sales. |
| **Business Rule** | BR-8: Expiry reminders must be sent at least 30 days before point expiration. |
| **Dependencies** | M7-UC5 (Personalized Offers for Loyal Customers) |
| **Priority** | Medium |

**M7-UC5: Personalized Offers for Loyal Customers**

**Table 7:5:1 Generate Personalized Offers Based on Loyalty Status**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Generate Personalized Offers Based on Loyalty Status |
| **Requirement** | The system shall generate personalized offers for loyal customers based on their current loyalty tier and purchasing behavior. |
| **Source** | Marketing Team |
| **Rationale** | Personalized offers increase the chances of customers making purchases and redeeming loyalty rewards. |
| **Business Rule** | BR-9: Offers must be relevant to the customer’s loyalty status and preferences. |
| **Dependencies** | M7-UC1 (Loyalty Program Creation) |
| **Priority** | High |

**Table 7:5:2 Display Personalized Offers to Customers**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Display Personalized Offers to Customers |
| **Requirement** | The system shall display personalized offers to customers in their account or via email based on their loyalty status. |
| **Source** | Marketing Team |
| **Rationale** | Displaying offers encourages customers to act on personalized deals, improving engagement. |
| **Business Rule** | BR-10: Offers must have a clear expiration date to drive urgency. |
| **Dependencies** | M7-UC4 (Notify Customers of Loyalty Status) |
| **Priority** | Medium |

**M7-UC6: Loyalty Program Effectiveness Analysis**

**Table 7:6:1 Analyze Loyalty Program Effectiveness**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Analyze Loyalty Program Effectiveness |
| **Requirement** | The system shall analyze the effectiveness of loyalty programs by tracking engagement metrics, redemption rates, and customer satisfaction. |
| **Source** | Admin Team |
| **Rationale** | Analyzing the effectiveness of loyalty programs allows businesses to optimize reward structures and improve customer satisfaction. |
| **Business Rule** | BR-11: Effectiveness analysis should occur quarterly. |
| **Dependencies** | M7-UC7 (Loyalty Reports Generation) |
| **Priority** | Medium |

**Table 7:6:2 Generate Insights for Loyalty Program Improvement**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Generate Insights for Loyalty Program Improvement |
| **Requirement** | The system shall generate insights and suggestions for improving loyalty programs based on the analysis of customer engagement and redemption data. |
| **Source** | Admin Team |
| **Rationale** | Insights help identify areas of improvement for loyalty programs to better meet customer expectations and business goals. |
| **Business Rule** | BR-12: Insights should include suggestions for enhancing reward structures and communication with customers. |
| **Dependencies** | M7-UC5 (Personalized Offers for Loyal Customers) |
| **Priority** | High |

**M7-UC8: Loyalty Program Integration with Sales Data**

**Table 7:8:1 Integrate Loyalty Program with Sales Data**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Integrate Loyalty Program with Sales Data |
| **Requirement** | The system shall integrate loyalty program data with sales data to provide a comprehensive view of customer behavior and loyalty trends. |
| **Source** | Admin Team |
| **Rationale** | Integrating data provides insights that can enhance marketing strategies and customer engagement. |
| **Business Rule** | BR-15: Integration must be updated daily to ensure current data reflects ongoing customer behavior. |
| **Dependencies** | M7-UC3 (Reward Points Allocation) |
| **Priority** | High |

**Table 7:8:2 Generate Combined Analytics Reports**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Generate Combined Analytics Reports |
| **Requirement** | The system shall generate reports that combine data from the loyalty program and sales to provide insights into the overall effectiveness of both strategies. |
| **Source** | Admin Team |
| **Rationale** | Combined analytics enable better understanding of how loyalty programs impact sales and customer retention. |
| **Business Rule** | BR-16: Reports must include both loyalty and sales metrics for comprehensive analysis. |
| **Dependencies** | M7-UC4 (Notify Customers of Loyalty Status) |
| **Priority** | Medium |

## Module 8: Pricing And Subscriptions

**M8-UC1: VR-Based Subscription Offering**

**Table 8:1:1 Display VR-Based Subscription Options**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Display VR-Based Subscription Options |
| **Requirement** | The system shall display available VR-based subscription options for customers on the subscription page. |
| **Source** | Marketing Team |
| **Rationale** | Displaying subscription options encourages customers to consider purchasing VR content. |
| **Business Rule** | BR-1: Subscription options must include a detailed description and pricing information. |
| **Dependencies** | M8-UC2 (Subscription Tier Management) |
| **Priority** | High |

**Table 8:1:2 Process Subscription Purchases**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Process Subscription Purchases |
| **Requirement** | The system shall allow customers to purchase a VR-based subscription using various payment methods. |
| **Source** | Sales Team |
| **Rationale** | Providing multiple payment options enhances customer convenience and increases sales. |
| **Business Rule** | BR-2: All payment transactions must comply with PCI-DSS standards for security. |
| **Dependencies** | M8-UC3 (Seamless Payment System Integration) |
| **Priority** | High |

**M8-UC2: Subscription Tier Management**

**Table 8:2:1 Create and Manage Subscription Tiers**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Create and Manage Subscription Tiers |
| **Requirement** | The system shall allow admins to create, update, and delete subscription tiers and their associated benefits. |
| **Source** | Admin Team |
| **Rationale** | Proper tier management allows flexibility in pricing and offering different benefits to customers. |
| **Business Rule** | BR-3: Each subscription tier must have clearly defined benefits and limitations. |
| **Dependencies** | M8-UC1 (VR-Based Subscription Offering) |
| **Priority** | High |

**Table 8:2:2 Update Tier Benefits**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Update Tier Benefits |
| **Requirement** | The system shall allow admins to modify the benefits associated with each subscription tier as necessary. |
| **Source** | Admin Team |
| **Rationale** | Updating tier benefits helps keep offerings competitive and aligned with customer expectations. |
| **Business Rule** | BR-4: Changes to tier benefits must be communicated to existing subscribers. |
| **Dependencies** | M8-UC4 (Subscription Metrics Analysis) |
| **Priority** | Medium |

**M8-UC3: Notify Customers of Special Discounts**

**Table 8:3:1 Generate Discount Notifications**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Generate Discount Notifications |
| **Requirement** | The system shall automatically generate notifications to customers about special discounts on subscriptions based on their preferences and behavior. |
| **Source** | Marketing Team |
| **Rationale** | Informing customers about discounts encourages engagement and potential purchases. |
| **Business Rule** | BR-5: Notifications must comply with customer opt-in preferences. |
| **Dependencies** | M8-UC4 (Personalized Offers for Loyal Customers) |
| **Priority** | High |

**Table 8:3:2 Send Notifications via Multiple Channels**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Send Notifications via Multiple Channels |
| **Requirement** | The system shall send discount notifications via email, SMS, and app notifications according to customer preferences. |
| **Source** | Marketing Team |
| **Rationale** | Utilizing multiple channels increases the likelihood of customers receiving and acting on discount notifications. |
| **Business Rule** | BR-6: Notifications should be sent within 24 hours of a discount being applied. |
| **Dependencies** | M8-UC2 (Subscription Tier Management) |
| **Priority** | Medium |

**M8-UC4: Subscription Benefits Display**

**Table 8:4:1 Display Subscription Benefits**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Display Subscription Benefits |
| **Requirement** | The system shall display the benefits associated with each subscription tier clearly on the subscription page. |
| **Source** | Marketing Team |
| **Rationale** | Clear communication of benefits helps customers make informed decisions when selecting a subscription. |
| **Business Rule** | BR-7: Benefits must be updated in real-time to reflect any changes made by the admin. |
| **Dependencies** | M8-UC1 (VR-Based Subscription Offering) |
| **Priority** | High |

**Table 8:4:2 Update Benefits Based on Customer Feedback**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Update Benefits Based on Customer Feedback |
| **Requirement** | The system shall allow admins to adjust benefits of subscription tiers based on customer feedback and market trends. |
| **Source** | Admin Team |
| **Rationale** | Adapting benefits based on feedback ensures that the subscription offerings meet customer needs and expectations. |
| **Business Rule** | BR-8: Changes to benefits must be documented and reviewed for compliance. |
| **Dependencies** | M8-UC3 (Notify Customers of Special Discounts) |
| **Priority** | Medium |

**M8-UC5: Subscription Metrics Analysis**

**Table 8:5:1 Analyze Subscription Metrics**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Analyze Subscription Metrics |
| **Requirement** | The system shall analyze subscription metrics such as sign-ups, renewals, and cancellations to provide insights into performance. |
| **Source** | Analytics Team |
| **Rationale** | Analyzing metrics helps the organization identify trends and make data-driven decisions to improve subscription offerings. |
| **Business Rule** | BR-9: Metrics should be analyzed monthly for timely insights. |
| **Dependencies** | M8-UC6 (Automated Renewal Notifications) |
| **Priority** | Medium |

**Table 8:5:2 Generate Insights from Analysis**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Generate Insights from Analysis |
| **Requirement** | The system shall generate insights from subscription metrics analysis to recommend improvements or adjustments to offerings. |
| **Source** | Analytics Team |
| **Rationale** | Generating actionable insights helps improve customer satisfaction and retention rates. |
| **Business Rule** | BR-10: Insights must be documented and reviewed quarterly. |
| **Dependencies** | M8-UC4 (Subscription Benefits Display) |
| **Priority** | Medium |

**M8-UC6: Automated Renewal Notifications**

**Table 8:6:1 Send Renewal Notifications**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Send Renewal Notifications |
| **Requirement** | The system shall automatically send renewal notifications to customers when their subscription is approaching expiration. |
| **Source** | Customer Support Team |
| **Rationale** | Automated renewal notifications increase the likelihood of subscription renewals. |
| **Business Rule** | BR-11: Notifications must be sent at least 7 days before subscription expiration. |
| **Dependencies** | M8-UC7 (Loyalty Reports Generation) |
| **Priority** | High |

**Table 8:6:2 Allow Customers to Opt-Out of Notifications**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Allow Customers to Opt-Out of Notifications |
| **Requirement** | The system shall allow customers to opt-out of renewal notifications through their account settings. |
| **Source** | Customer Experience Team |
| **Rationale** | Providing customers with control over notifications respects their preferences and improves satisfaction. |
| **Business Rule** | BR-12: Opt-out requests must be processed immediately. |
| **Dependencies** | M8-UC5 (Subscription Metrics Analysis) |
| **Priority** | Medium |

**M8-UC7: Seamless Payment System Integration**

**Table 8:7:1 Integrate Payment Systems**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Integrate Payment Systems |
| **Requirement** | The system shall integrate with multiple payment gateways to facilitate subscription payments. |
| **Source** | IT Team |
| **Rationale** | Multiple payment options provide customers with flexibility and convenience. |
| **Business Rule** | BR-13: Payment processing must comply with all relevant security standards. |
| **Dependencies** | M8-UC1 (VR-Based Subscription Offering) |
| **Priority** | High |

**Table 8:7:2 Ensure Secure Payment Transactions**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Ensure Secure Payment Transactions |
| **Requirement** | The system shall ensure that all payment transactions are securely processed and encrypted. |
| **Source** | IT Team |
| **Rationale** | Security is critical to protect customer financial information and maintain trust. |
| **Business Rule** | BR-14: All payment data must be handled according to PCI-DSS standards. |
| **Dependencies** | M8-UC3 (Notify Customers of Special Discounts) |
| **Priority** | High |

**M8-UC8: 24/7 Subscriber Support**

**Table 8:8:1 Provide 24/7 Customer Support**

|  |  |
| --- | --- |
| **Identifier** | FR-1 |
| **Title** | Provide 24/7 Customer Support |
| **Requirement** | The system shall provide round-the-clock support for subscribers, allowing them to resolve issues related to their subscriptions. |
| **Source** | Customer Support Team |
| **Rationale** | Offering 24/7 support ensures customer issues are addressed promptly, enhancing satisfaction. |
| **Business Rule** | BR-15: Support responses must occur within 1 hour. |
| **Dependencies** | M8-UC2 (Subscription Tier Management) |
| **Priority** | High |

**Table 8:8:2 Allow Customers to Submit Support Requests**

|  |  |
| --- | --- |
| **Identifier** | FR-2 |
| **Title** | Allow Customers to Submit Support Requests |
| **Requirement** | The system shall allow customers to submit support requests through multiple channels (chat, email, phone). |
| **Source** | Customer Support Team |
| **Rationale** | Multiple submission channels enhance customer accessibility to support. |
| **Business Rule** | BR-16: Support requests must be tracked and monitored for response time compliance. |
| **Dependencies** | M8-UC1 (VR-Based Subscription Offering) |
| **Priority** | Medium |

## Non-Functional Requirements

**Reliability:**

The platform must guarantee uninterrupted operation with little outages.  
  
**R-1:** During normal operation, the system must maintain an MTBF (Mean Time Between Failures) of 500 hours.  
**R-2:** Automatic failover measures should allow the system to recover in five minutes in the event of a failure.  
**R-3:** Error correction techniques should automatically fix 90% of recognized faults without user intervention, and failure detection should happen within 30 seconds of an issue.  
**R-4:** To guarantee a 99.9% service availability rate, downtime should not surpass three hours annually.

**Usability:**

The platform needs to be user-friendly in order to guarantee effective user interactions and accessibility for a wide range of users.  
  
**USE-1:** Within 10 minutes of their initial login, new users should be able to complete important tasks (such analyzing customer interactions) with less than five clicks or interactions.  
**USE-2:** With a 95% success rate for non-technical users, the platform should feature an error recovery system that gives users clear guidance on how to fix issues.  
**USE-3:** In order for the system to be usable by those with disabilities, it must adhere to WCAG 2.1 Level AA accessibility criteria.

**Performance:**

Even in situations of high load, the platform's performance ought to live up to user expectations.  
  
**PER-1:** On a 20 Mbps connection, 95% of the platform's webpages, including dashboards for client interactions, must load in 3 seconds.  
**PER-2:** Within two seconds of submission, the system must process the analytics of 1000 client interactions.  
**PER-3:** Up to 5000 users must be able to access the system at once without experiencing a performance drop of greater than 1%.

**Security:**

To guarantee the confidentiality and integrity of consumer data, security measures are essential.  
  
**SEC-1**: For up to 48 hours, users with advanced skill levels should be unable to break the system without gaining illegal access.  
**SEC-2:** AES-256 encryption standards must be used for all client data, both in transit and at rest.  
**SEC-3:** Within 60 seconds of detecting a breach attempt, the system must report all unsuccessful access attempts and alert administrators.

# Architecture and Design

The following parts of Software Design Description (SDD) report should be included in this chapter.



## System Architecture

The **AI-Driven Customer Experience Management Platform** utilizes a **3-Tier Architecture Design**.

The three-tier architecture comprises three independent layers: **Presentation Tier (Client Layer)**, **Application Tier (Business Layer)**, and **Data Tier (Data Layer)**.

* The **Presentation Tier** serves as the user interface, providing access through web and mobile applications.
* The **Application Tier** processes data, implements business logic, and interacts with external services.
* The **Data Tier** manages and stores all the data associated with the application in relational and NoSQL databases.

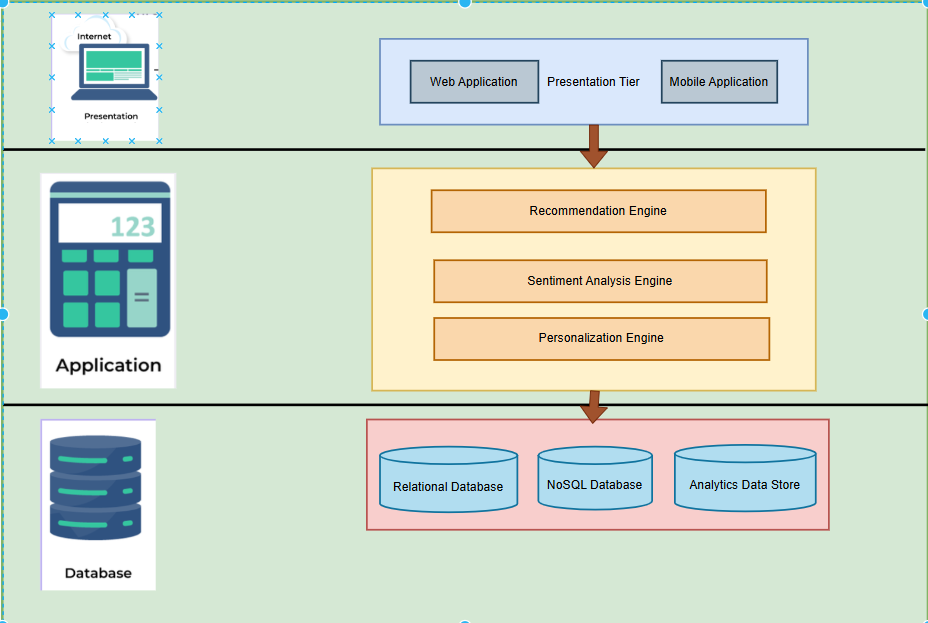
A **three-phase architecture** ensures the system is organized into three logical and physical components:

1. **Launch Phase (Client Layer)**: User-friendly interfaces for accessing the platform via web or mobile devices.
2. **Application Phase (Business Layer)**: Processes data and executes the business rules necessary for the platform's functionality.
3. **Data Section (Data Layer)**: Stores, organizes, and retrieves data for seamless operation.

**Advantages of 3-Tier Architecture**

The main benefits of using this architecture are:

* **Better Scalability**: Each layer can scale independently, ensuring the system handles increased user load efficiently.
* **Better Security**: Sensitive operations and data are processed in isolated backend layers, minimizing risks.
* **Better Reliability**: Modular design ensures that faults in one layer do not affect the others, improving system uptime.



3-tier Architecture Diagram

## Design methodology

***Object-Oriented Methodology:***

Because our system will need code reusability and depends on massive, complicated datasets, object-oriented design is being used. For larger systems that need to be scalable and maintainable, OOP is frequently advised. Real-world entities can be represented by OOP as objects, each of which has unique properties (data members) and actions (data functions). Among the fundamental object-oriented ideas that will enable us to create a modular design that promotes code reuse and maintainability are encapsulation and inheritance. Furthermore, procedural approaches lack the flexibility needed for complex systems like AI-driven CEM.

## Data Representation [Diagram + Description] (ERD , JSON SCHEMA)

* **Databases or Data Storage**

**Relational Database** (e.g., MySQL/PostgreSQL):

* + User profiles
  + Interaction logs
  + Subscription details

**NoSQL Database** (e.g., MongoDB):

* + Sentiment analysis data
  + Recommendations
  + Real-time analytics

Following is the Entity relation diagram:

A diagram of a user

Description automatically generated

**Entity Relationship Diagram, Logical Model**

**Json Data Scheme**

{

"User": {

"UserID": "string",

"Name": "string",

"Email": "string",

"Preferences": {

"Categories": ["string"],

"NotificationsEnabled": "boolean"

},

"LoyaltyPoints": "integer"

},

"Interaction": {

"InteractionID": "string",

"UserID": "string",

"Channel": "string",

"Timestamp": "string",

"Sentiment": {

"Category": "string",

"Score": "float"

}

},

"Recommendation": {

"RecommendationID": "string",

"UserID": "string",

"Products": [

{

"ProductID": "string",

"Timestamp": "string"

}

]

},

"Subscription": {

"SubscriptionID": "string",

"UserID": "string",

"Tier": "string",

"StartDate": "TimeStamp",

"EndDate": "TimeStamp"

}

}

## Data dictionary

|  |  |  |  |
| --- | --- | --- | --- |
| **Entity** | **Attribute** | **Data Type** | **Description** |
| **Interaction** | InteractionID | String | Unique identifier for a user interaction |
|  | UserID | String | Foreign key linking to the user |
|  | Channel | String | Platform of interaction (e.g., email, social media) |
|  | Timestamp | String | Date and time of interaction |
| **Recommendation** | RecommendationID | String | Unique identifier for a recommendation |
|  | UserID | String | Foreign key linking to the user |
|  | ProductID | String | Identifier for the recommended product |
|  | Timestamp | String | Date and time when the recommendation was generated |
| **Sentiment** | SentimentID | String | Unique identifier for sentiment data |
|  | InteractionID | String | Foreign key linking to an interaction |
|  | Category | String | Sentiment category (positive, neutral, or negative) |
|  | Score | Float | Sentiment intensity score |
| **Subscription** | SubscriptionID | String | Unique identifier for the subscription |
|  | UserID | String | Foreign key linking to the user |
|  | Tier | String | Subscription tier (e.g., Basic, Premium) |
|  | StartDate | TimeStamp | Subscription start date |
|  | EndDate | TimeStamp | Subscription end date |
| **User** | UserID | String | Unique identifier for the user |
|  | Name | String | User’s full name |
|  | Email | String | User’s email address |
|  | Preferences | Object | User-defined settings (e.g., categories of interest) |
|  | LoyaltyPoints | Integer | Points accumulated in the loyalty program |

## Design Models [along with descriptions]

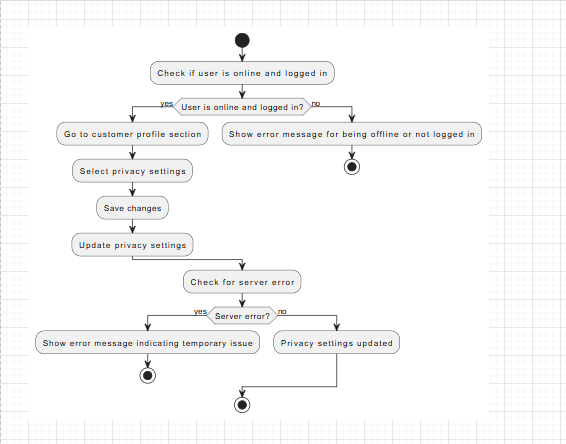
## Activity Diagrams

## Module 1: Profile Management

A diagram of a flowchart

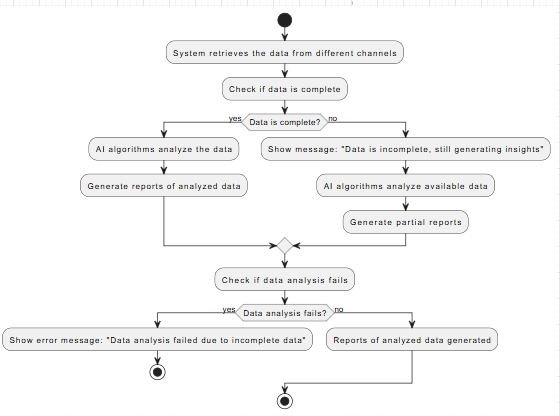
Description automatically generated

**Activity Diagram (Update Profile)**



**Activity Diagram (Manage Privacy Settings)**

## Module 2: Customer Interaction Analysis:



**Activity Diagram (****Data Gathering)**

A diagram of a data flow

Description automatically generated

**Activity Diagram (Recommendations)**

## Module 3: Personalization:

A diagram of a customer

Description automatically generated

Activity Diagram (Personalized Product Recommendation)

A diagram of a customer service

Description automatically generated

Activity Diagram (Real-Time Personalization Offers)

## Module 4: Performance Metrics Dashboard

A diagram of a system

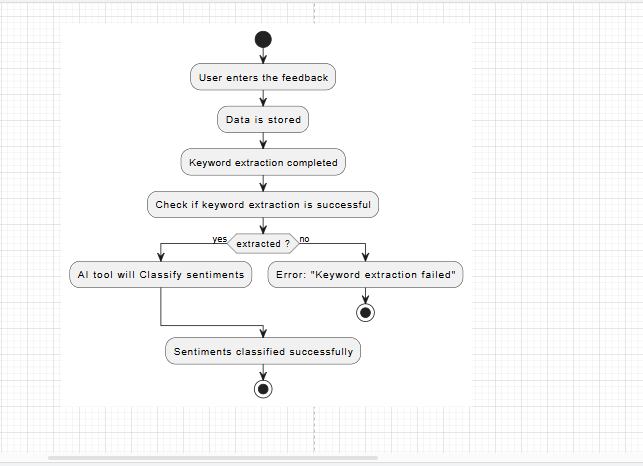
Description automatically generated**Activity Diagram (KPIs Monitoring)**

A diagram of a system

Description automatically generated

Activity Diagram (Real-Time Performance Monitoring)

## Module 5: Sentimental Analysis:



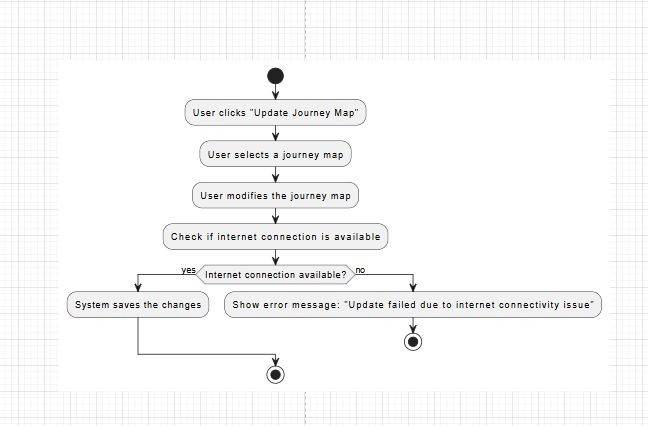
Activity Diagram (Sentimental Classification)

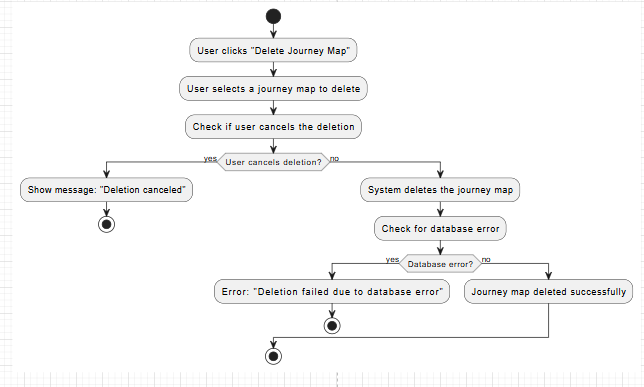
A diagram of a system

Description automatically generated

**Activity Diagram (****Alerts Generation)**

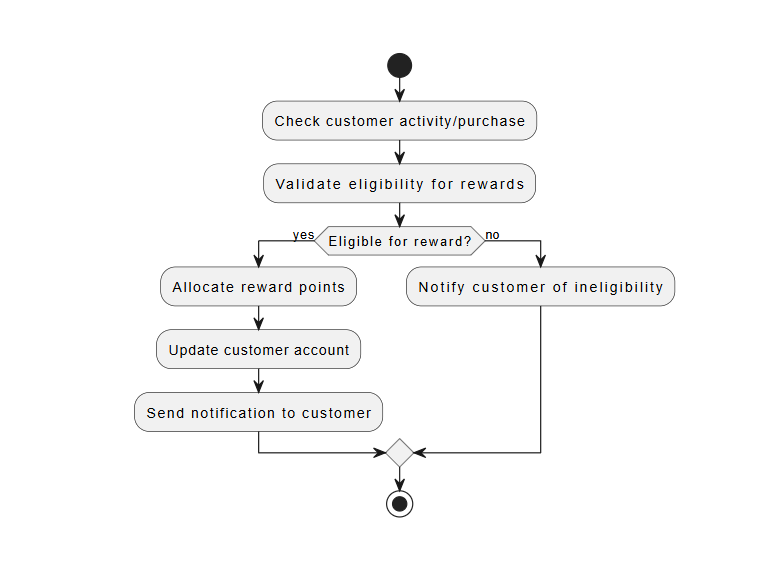
## Module 6: Customer Journey Map

**Activity Diagram (****Update Journey Map)**



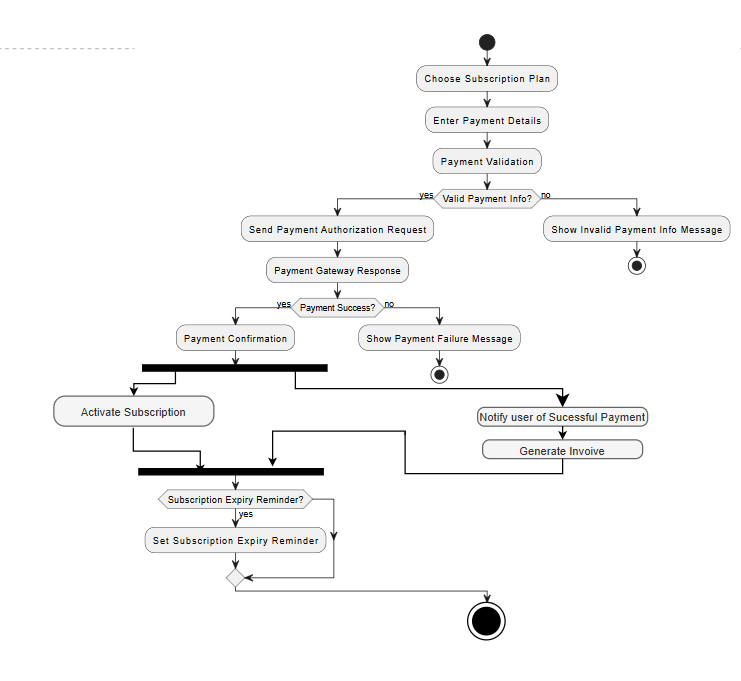
**Activity Diagram (Delete Journey Map)**

## Module 7: Loyalty And Rewards Program

****

**Activity Diagram (Reward Points Allocation)**

## Module 8: Pricing and Subscription

****

**Activity Diagram (Seamless Payment System Integration)**

## Sequence Diagrams:

## Module 1: Profile Management:

A diagram of a system

Description automatically generated

**Sequence Diagram (Update Profile)**

**A diagram of a system

Description automatically generated**

**Sequence Diagram (Manage Privacy Settings)**

## Module 2: Customer Interaction Analysis:

A screenshot of a graph

Description automatically generated

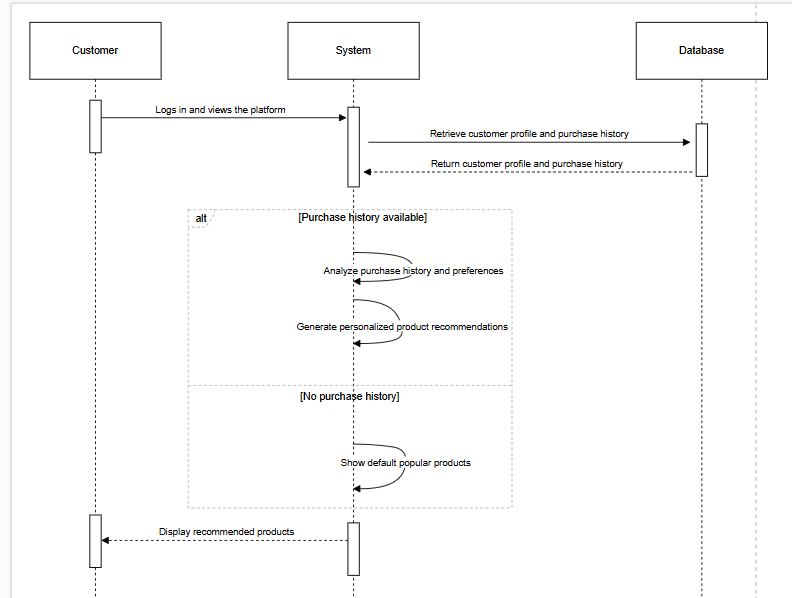
Sequence Diagram (Data Gathering)

A diagram of data storage

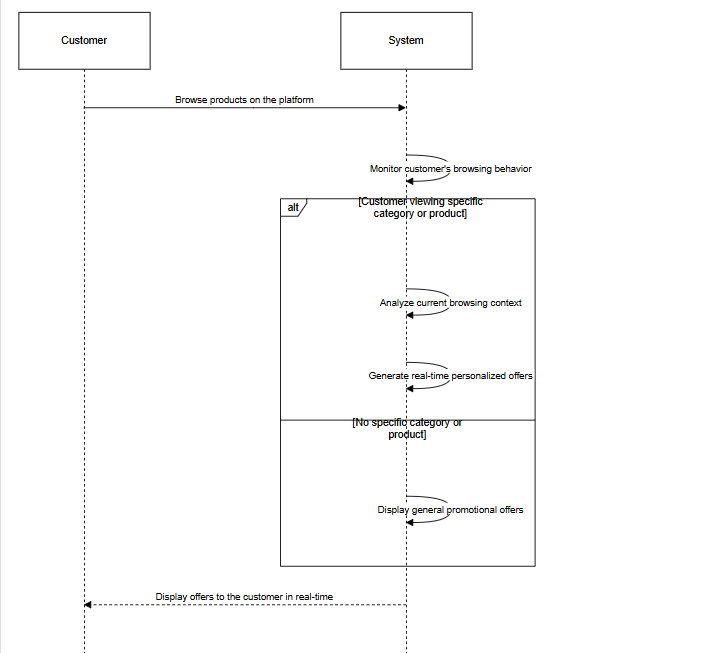
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**Sequence Diagram (Recoomenadtions)**

## Module 3: Personalization:



Sequential Diagram (Personalized Product Recommendation)



Sequence Diagram (Real-Time Personalization Offers)

## Module 4: Performance Metrics Dashboard

A diagram of a data flow

Description automatically generated**Sequence Diagram (KPIs Monitoring)**

A diagram of a system

Description automatically generated

Sequence Diagram (Real-Time Performance Monitoring)

## Module 5: Sentimental Analysis:

A diagram of data storage

Description automatically generated

**Sequence Diagram (Sntimental Classification)**

A diagram of a customer service team

Description automatically generated

**Sequence Diagram (Alert nOtifications)**

## Module 6: Customer Journey Map

A diagram of a system

Description automatically generated

**Sequence Diagram (Update Journey Map)**

A diagram of a journey map

Description automatically generated

**Sequence Diagram (Nodule detection and classification)**

## Module 7: Loyalty And Rewards Program

**A diagram of a customer

Description automatically generated**

**Sequence Diagram (Reward Points Allocation)**

## Module 8: Pricing and Subscription

**A diagram of a document

Description automatically generated**

**Sequence Diagram (Seamless Payment System Integration)**

## Class Diagram

A diagram of a company

Description automatically generated

**Class Diagram**

## State Transition Diagram:

A diagram of a company

Description automatically generated

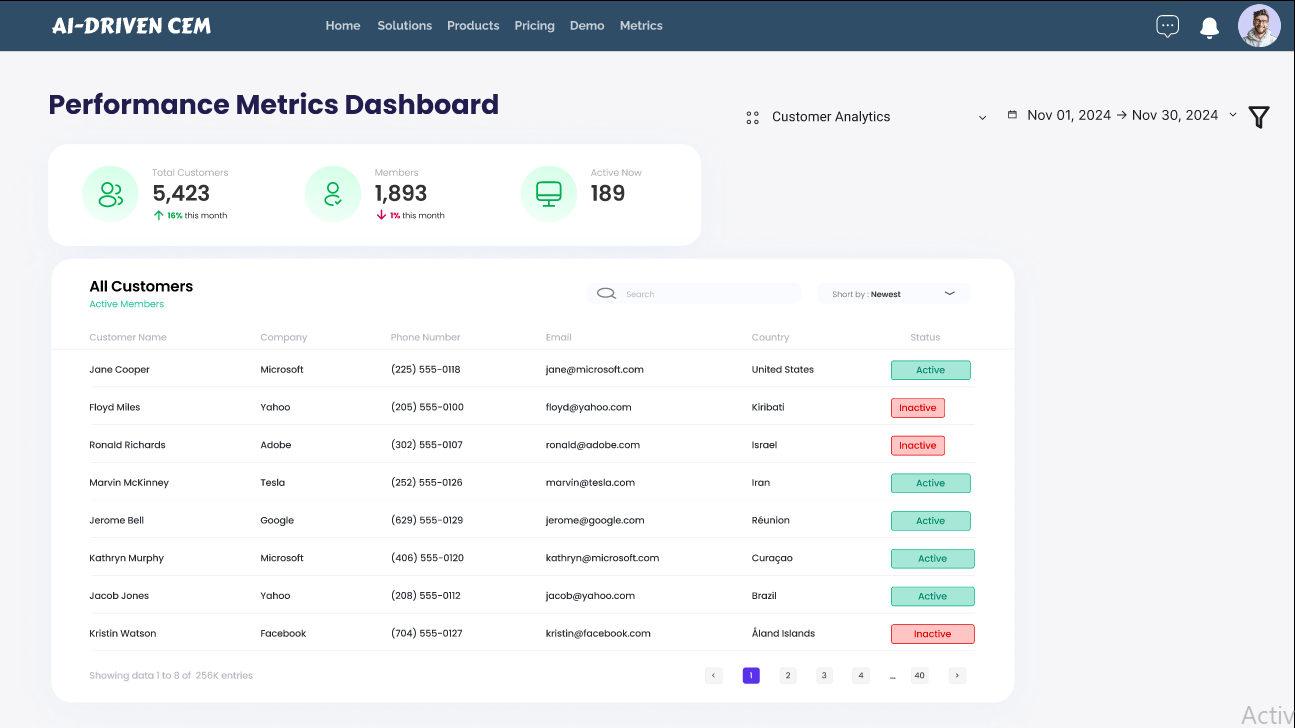
**State Transition Diagram**

# Human Interface Design

Describe the functionality of the system from the user’s perspective. Explain how the user will be able to use your system to complete all the expected features and the feedback information that will be displayed for the user.

## Screen images

* **Web**

****

**Figure: Customer Analytics Dashboard**

**A screenshot of a dashboard

Description automatically generated**

**Figure: Customer Satisfaction Dashboard**

**A screenshot of a computer

Description automatically generated**

**Figure: KPIs Dashboard**

**A screenshot of a website

Description automatically generated**

**Figure: Pricing and Subscription**

* **Mobile:**

**A screenshot of a phone

Description automatically generated**

**Figure: Pricing Menu**

**A screen shot of a phone

Description automatically generated**

**Figure: Pricing Menu**

**A screenshot of a phone

Description automatically generated**

**Figure: Customer Analytics Dashboard**

**A screen shot of a phone

Description automatically generated**

**Figure: KPIs Dashboard**

## Screen objects and actions

1. **Dashboard for Customers**Customer information, past interactions, sentiment analysis findings, and AI-powered suggestions.  
   See past customer interactions, examine sentiment analysis, and get tailored AI suggestions.
2. **Interaction Data Upload Screen:**

Data preview, customer data input, and file upload button.   
Attach data to particular customer records and upload interaction data.

1. **Workspace for Support Agents** Feedback form, response templates, customer interaction logs, and customer support tools.   
    Access client logs, use templates to respond, and get feedback.
2. **Overview of Sentiment Analysis** Keyword extraction, sentiment score chart, and sentiment analysis dashboard.   
    Examine keyword trends, view sentiment analysis results, and decipher sentiment scores.
3. **AI Recommendation Interface:**

Recommendation results panel, customer data input fields, and AI model selection.   
 Set up AI suggestions, enter client information for evaluation, and examine suggestions that are produced.

1. **Loyalty Program:**

Loyalty points balance, reward program, status tracker

1. **Alert Notification:**

Generate alert notification whenever there is high negative feedback form cusotmers. View and respond to notifications, prioritize alerts.

# Implementation

This chapter will discuss implementation details supported by UML diagrams (if applicable). You will not put your source code here. Any of the following sections may be included based on your project.



## Algorithm

Below are a few algorithms and pseudocode of the proposed AI-Driven Customer Relationship Management System to illustrate the functionality and potential implementation:

**Algorithm: Sentiment Analysis Module**

1. Start

2. Receive customer interaction data (e.g., chat transcripts, reviews)

3. Apply natural language processing (NLP) to parse text

4. Analyze sentiment using machine learning models (positive, negative, neutral)

5. Generate a sentiment report for further analysis

6. Provide feedback to customer support representatives

7. End

**Algorithm: AI Recommendation Engine Module**

1. Start

2. Retrieve customer profile and interaction history

3. Apply machine learning algorithms to identify customer preferences

4. Generate personalized product or service recommendations

5. Integrate recommendations with the customer journey for display

6. Monitor the effectiveness of recommendations in real-time

7. Update recommendations based on customer behavior

8. End

**Algorithm: VR Training Module**

1. Start

2. Create virtual training scenarios for customer service teams

3. Integrate real customer interaction data for simulation realism

4. Provide guided training through AI-driven feedback loops

5. Track team performance and learning outcomes

6. Allow adjustments to training modules based on team feedback

7. Store training results for progress evaluation

8. End

**Algorithm: Customer Interaction Data Analysis Module**

1. Start

2. Collect customer interaction data from various platforms (e.g., calls, emails, social media)

3. Standardize and clean the data for consistency

4. Analyze data to identify common issues and trends

5. Generate actionable insights for customer support improvement

6. Present analysis results in a report for management

7. Store insights in a centralized database for future use

8. End

**Algorithm: Loyalty Program Tracking Module**

1. Start

2. Retrieve customer participation data in the loyalty program

3. Track activity and update the customer’s points or status

4. Identify loyalty milestones and potential rewards

5. Notify customers of available rewards and status updates

6. Integrate with other modules for personalized recommendations based on loyalty status

7. End

**Algorithm: Subscription Management Module**

1. Start

2. Access the customer’s current subscription details

3. Allow updates to subscription plans (e.g., upgrade/downgrade)

4. Manage billing details and payment processing

5. Display benefits associated with the active subscription

6. Notify the customer about any changes or updates

7. Ensure compatibility with loyalty and interaction modules for cohesive user experience

8. End

These algorithms outline the essential processes and interactions within each module of the proposed system, showcasing how they contribute to comprehensive customer relationship management and enhanced.  
  
  
  
**Pseudocode:**  
In this section, the pseudocode below represents an object-oriented approach for an AI-driven customer relationship management system. Each class encapsulate its own set of attributes and methods, ensuring modularity and clarity. Relationships among these classes showcase inheritance, composition, and usage patterns that reflect real-world interactions and responsibilities. This design promotes scalability, maintainability, and the effective delegation of tasks among various components of the system.

The User class acts as the base class for Admin and Customer, allowing shared functionalities while enabling specific extensions. The AI modules, such as SentimentAnalysis andAIRecommendationEngine, interact seamlessly with customer data to enhance insights and personalize user experiences. Composition is shown through classes like CustomerInteractionData and CustomerJourney, which are part of the customer's overall data structure. Each object serves a specific role, encapsulating its processes and making the system modular and easy to maintain.

class User:

attributes:

username: string

password: string

role: string

methods:

login()

logout()

class Admin extends User:

attributes:

admin\_id: string

methods:

manage\_users()

view\_analytics()

class Customer extends User:

attributes:

customer\_id: string

name: string

contact\_details: string

interaction\_history: string

methods:

view\_profile()

update\_profile()

class SentimentAnalysis:

methods:

analyze\_sentiment(text: string)

generate\_report()

class AIRecommendationEngine:

methods:

generate\_recommendations(customer\_data: Customer)

personalize\_experience()

class VRTrainingModule:

methods:

create\_training\_scenario()

train\_customer\_support\_team()

class CustomerJourney:

attributes:

journey\_id: string

touch\_points: string

methods:

track\_journey()

update\_journey\_map()

class CustomerInteractionData:

attributes:

data\_id: string

platform\_source: string

methods:

analyze\_interaction\_data()

generate\_insights()

class LoyaltyProgram:

attributes:

program\_id: string

status: string

methods:

track\_loyalty()

assign\_rewards()

class SubscriptionPlan:

attributes:

plan\_id: string

plan\_name: string

methods:

manage\_subscription()

view\_benefits()

relationships:

Admin manages Customer

Customer has CustomerInteractionData

Customer tracks CustomerJourney

Customer enrolled in LoyaltyProgram

Customer subscribed to SubscriptionPlan

CustomerJourney uses SentimentAnalysis

CustomerJourney receives recommendations from AIRecommendationEngine

AIRecommendationEngine analyzes Customer data

VRTrainingModule trains Customer service team

## External APIs

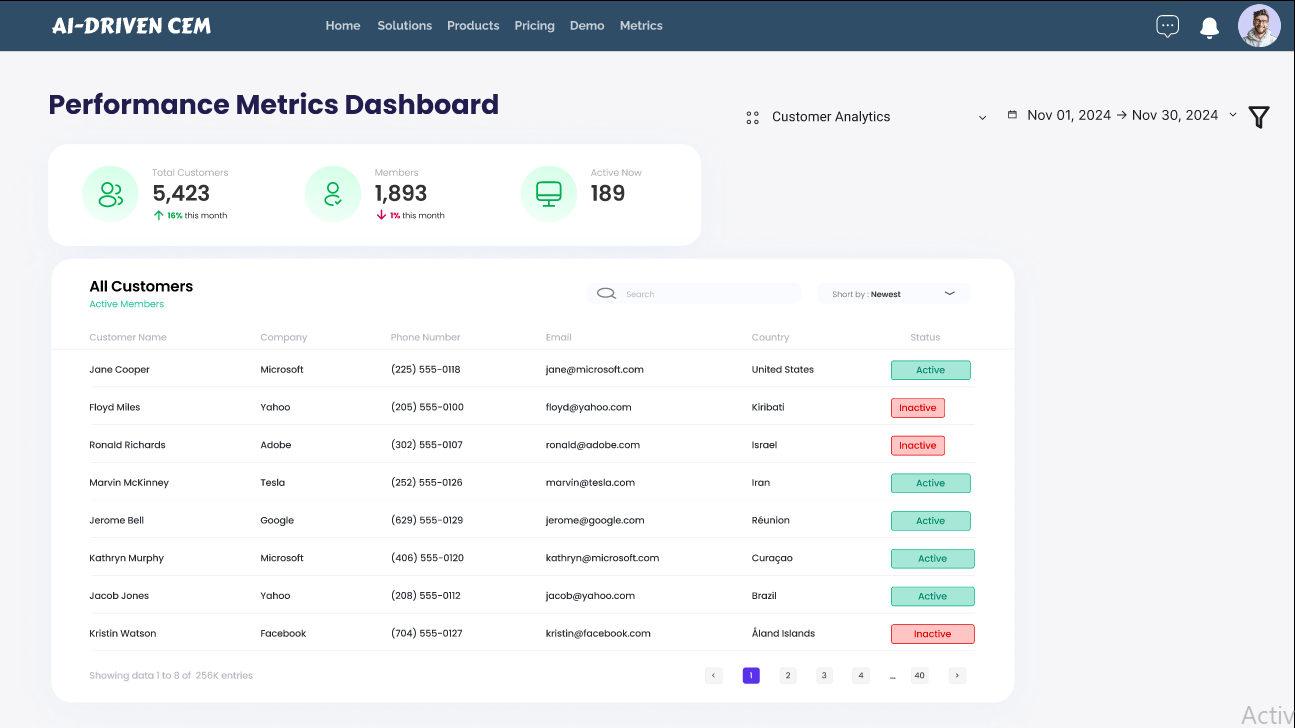
Describe the APIs used in the following table.

Table 5: Details of APIs used in the project

|  |  |  |  |
| --- | --- | --- | --- |
| **Name of API** | **Description of API** | **Purpose of Usage** | **List of Functions/Classes Where Used** |
| **Google Cloud Natural Language API** | Provides tools for text analysis, sentiment detection, and entity recognition using machine learning. | Used in the Sentiment Analysis Engine to assess customer emotions from interactions (e.g., emails, surveys). | analyzeSentiment(), extractEntities(), SentimentAnalyzer |
| **Facebook Graph API** | Offers access to Facebook user data, pages, and interactions such as comments and messages. | Used in Customer Interaction Analytics to gather customer interaction data from Facebook. | fetchSocialData(), CustomerInteractionManager |
| **Twitter API** | Enables access to Twitter data, including tweets, likes, and replies. | Collects customer feedback and interaction data from Twitter for sentiment and trend analysis. | getTweetsByUser(), InteractionAggregator |
| **OpenAI GPT API** | A conversational AI API for text generation, summarization, and recommendation generation. | Used in Personalization Engine to suggest tailored experiences or responses based on customer interaction data. | generateRecommendations(), PersonalizationEngine |
| **Tableau REST API** | Provides access to Tableau for retrieving, publishing, and updating visualization data. | Used in Performance Metrics Dashboard to integrate real-time customer satisfaction metrics and KPIs. | fetchDashboardData(), updateMetricsVisualization() |
| **Salesforce API** | Provides access to Salesforce CRM data, including customer details, leads, and historical interactions. | Used in Customer Interaction Analytics to retrieve and analyze customer data for interaction patterns. | fetchCustomerDetails(), CustomerDataAnalyzer |
| **AWS S3 API** | Offers storage and retrieval of data from Amazon S3 buckets. | Used for storing and retrieving customer interaction logs, analytics reports, and video training data. | storeAnalyticsReports(), retrieveTrainingData() |

## User Interface

* **Web**

****

**Figure: Customer Analytics Dashboard**

**A screenshot of a dashboard

Description automatically generated**

**Figure: Customer Satisfaction Dashboard**

**A screenshot of a computer

Description automatically generated**

**Figure: KPIs Dashboard**

**A screenshot of a website

Description automatically generated**

**Figure: Pricing and Subscription**

* **Mobile:**

**A screenshot of a phone

Description automatically generated**

**Figure: Pricing Menu**

**A screen shot of a phone

Description automatically generated**

**Figure: Pricing Menu**

**A screenshot of a phone

Description automatically generated**

**Figure: Customer Analytics Dashboard**

**A screen shot of a phone

Description automatically generated**

**Figure: KPIs Dashboard**

# Testing and Evaluation

This chapter may include the following sections. (Students are required to perform the testing both manually and automatedly).

## Verification

Verification in the **AI-Driven Customer Experience Management (CEM) Platform** ensures that the project adheres to the agreed-upon plans and requirements set by stakeholders. It involves reviewing each step of the development process to confirm alignment with the design and functional specifications. The goal is to verify that the system is being built correctly according to the outlined objectives.

## Validation

Validation ensures that the **CEM Platform** meets the specified requirements and fulfills customer needs. It incorporates various testing methods, including white box, black box, unit, and integration testing, to confirm that the system performs as intended. This phase focuses on ensuring that the final product aligns with the desired outcomes and functions seamlessly for end users.

## Usability Testing

Usability testing assesses the user interface and experience of each module in the **CEM Platform**. It focuses on creating an intuitive design by testing layouts, color schemes, and navigational elements to ensure ease of use. The goal is to provide users with a seamless and user-friendly experience across all devices and platforms.

## Module / Unit Testing

Module and unit testing focus on testing individual components of the **CEM Platform** in isolation. Each module is examined to verify that it meets its functional requirements and operates without errors. This early-stage testing ensures that potential issues are identified and resolved before integration, improving the overall system reliability.

## Integration Testing

Integration testing evaluates how different modules of the **CEM Platform** interact with each other. It ensures that individual components, such as Customer Interaction Analytics, Sentiment Analysis, and Personalization Engine, work together seamlessly. This phase verifies that data flow and combined functionalities meet the expected outcomes.

## System Testing

System testing involves testing the fully integrated **CEM Platform** to identify and resolve defects. The focus is on assessing system performance under different conditions and ensuring it functions as expected. It includes testing across multiple browsers, operating systems, and devices to guarantee a robust and reliable product.

## Acceptance Testing

Acceptance testing confirms that the **CEM Platform** meets all user requirements and business objectives. It evaluates the system's usability, performance, and overall quality to ensure it aligns with stakeholder expectations. This phase guarantees that the platform is ready for deployment and provides a satisfactory user experience on both web and mobile platforms.



## Manual Testing

.

## Test Cases.

### Unit Testing (Test Cases)

## Module 1 : Profile Management

**Test Case 1:User Registration**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-01 | **Test Case Designed by:** | Alisha Ejaz |
| **Test Case Title:** | User Registration in AI driven Customer Experience Management | **Test Case Executed by:** | Alisha Ejaz |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 12/12/24 |
| **Test Data:** | Name: ALI HASSAN  Email: alihassan@example.com  Password: Password@123 | **Priority:** | High |
| **Precondition:** | | The user is on web or app and registration screen is opened. | |
| **Test Steps** | | **System Response** | |
| Enter valid name, email, password.  Click on register to create an account | | The system should validate the provided information.  If the information is valid, the system should create a new user account. | |
| **Expected Result:** | | A successful registration message should be displayed.  The user should be redirected to the app's main screen or the login screen with the registered email pre-filled**.** | |
| **Actual Result:** | | After tapping on the "Register" button, a success message is displayed. The user is redirected to the login screen with the registered email pre-filled. | |
| **Status:** | | Pass | |

**Test Case 2:User Sign in**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-02 | **Test Case Designed by:** | Alisha Ejaz |
| **Test Case Title:** | User Sign in | **Test Case Executed by:** | Alisha Ejaz |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 14/12/2024 |
| **Test Data:** | Name: ALI HASSAN  Email: alihassan@example.com  Password: Password@123 | **Priority:** | High |
| **Pre-conditions** | | The app has installed, account is already created  The user has a stable internet connection and is on login screen. | |
| **Steps /Action:** | | **System Response** | |
| |  |  | | --- | --- | | . Enter valid Email and Password and tap "Sign In." | The system validates the credentials and logs in the user. |  |  | | --- | | 2. Redirect to the dashboard. | | | The app should validate the entered information and display appropriate error messages if any field is invalid or missing.  And login the user | |
| **Expected Result:** | | The user is successfully logged in and redirected to the main screen. | |
| **Actual Result:** | | [To be filled during execution] | |
| **Status:** | | Pass | |

**Test case 3:** **Update Profile**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-03 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | Update Profile | **Test Case Executed by:** | zubaria |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 11/12/24 |
| **Test Data:** | Name: Ali Hassan  Phone: +123456789  Email [ali@gamil.com](mailto:ali@gamil.com)  Password: pass@123 | **Priority:** | Medium |
| **Precondition:** | | The user has installed the app and has astable connection  The user is logged in and navigates to the "Edit Profile" screen | |
| **Steps /Action** | | **System Response** | |
| 1. Edit Name and Phone, email and password in fields. 2. Save the fields data | | The system validates and updates the profile.  A success message is displayed. | |
| **Expected Result:** | | Profile will update successfully, and message will be displayed. | |
| **Actual Result:** | | Profile update successfully, and message displayed. | |
| **Status:** | | Pass | |

**Testcase 4: View Customer Profile:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-04 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | View Customer Profile | **Test Case Executed by:** | zubaria |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 14/12/24 |
| **Test Data:** | No specific test data is required for this test case. | **Priority:** | High |
| **Precondition:** | | . The user is logged in and navigates to the Customer Profiles" page. | |
| **Steps /Action** | | **System Response** | |
| 1. Logged into system 2. Select a customer from the list. | | The system retrieves and displays the selected profile details. | |
| **Expected Result:** | | Customer profile details are displayed correctly. | |
| **Actual Result:** | | The app successfully enable logged in.  Customer profile details are displayed correctly. | |
| **Status:** | | Pass | |

**Testcase 5: Manage Privacy Settings**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-05 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | Manage Privacy Settings | **Test Case Executed by:** | zubaria |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | No specific test data is required for this test case. | **Priority:** | High |
| **Precondition:** | | .The AI driven application is installed on the user's device.  The user is logged into their account.  The device has a stable internet connection. | |
| **Steps /Action** | | **System Response** | |
| Launch AI driven customer experience management app. Navigate to the "Settings" or "Privacy Settings" section. 1. Update privacy settings (e.g., hide email). | | The app should save the user's updated privacy preferences.  If the app requires additional permissions (e.g., location permissions), prompt the user accordingly.  Display a confirmation message or visually indicate that the privacy settings have been updated successfully. | |
| **Expected Result:** | | The app should successfully apply the user's selected privacy settings | |
| **Actual Result:** | | The app should successfully apply the user's selected privacy settings | |
| **Status:** | | Pass | |

**Test case 6: Share Profile**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-06 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | Share Profile | **Test Case Executed by:** | zubaria |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Profile data of customers | **Priority:** | High |
| **Precondition:** | | .The AI driven customer experience management is installed on the user's device.  The user is logged in to their account.  The user is logged in and on the "Share Profile" screen. | |
| **Steps /Action** | | **System Response** | |
| |  | | --- | | 1. Logged in 2. Select customer profile 3. Profile is successfully shared via the 4. chosen platform. | | | The app should log the user out of their account.  The system prepares the profile data for sharing.  The system shares the profile via the selected platform. | |
| **Expected Result:** | | Profile is successfully shared via the chosen platform. | |
| **Actual Result:** | | Profile is successfully shared via the chosen platform. | |
| **Status:** | | Pass | |

**Test case 7: Notification Management**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-07 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | Notification Management | **Test Case Executed by:** | zubaria |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 17/12/24 |
| **Test Data:** | .No data to be entered | **Priority:** | High |
| **Precondition:** | | .The AI driven customer experience management is installed on the user's device.  The user is logged in to their account.  The user is logged in and on the "Notification Settings" page. | |
| **Steps /Action** | | **System Response** | |
| |  | | --- | | 1. Logged in 2. Select customer profile 3. Update notification preferences (e.g.,   enable email alerts). | | | The system saves the preferences and displays a success message. | |
| **Expected Result:** | | Notification preferences are updated successfully.. | |
| **Actual Result:** | | Notification preferences are updated successfully. | |
| **Status:** | | Pass | |

**Test case 8: Customers Profile**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-08 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | ViewCustomers Profile List | **Test Case Executed by:** | zubaria |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 17/12/24 |
| **Test Data:** | .No data to be entered | **Priority:** | Low |
| **Precondition:** | | .The AI driven customer experience management is installed on the user's device.  The user is logged in to their account.  The user is logged in and navigates to the "Customers Profile" section. | |
| **Steps /Action** | | **System Response** | |
| |  | | --- | | 1. Logged in 2. Select customer profile | | | The system displays a list of customer profiles. | |
| **Expected Result:** | | The customer profile list is displayed accurately. | |
| **Actual Result:** | | The customer profile list is displayed accurately.. | |
| **Status:** | | Pass | |

**Test case 9: Delete Account**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-09 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | Delete Account | **Test Case Executed by:** | zubaria |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 17/12/24 |
| **Test Data:** | .No data to be entered | **Priority:** | Low |
| **Precondition:** | | The user is logged in and on the "Account  Settings" page. | |
| **Test Steps / Action** | | **System Response** | |
| Click on "Delete Account" and confirm the action.  Account will be deleted from database | | The system verifies and deletes the user account  And confirmation message of deleting account | |
| **Expected Result:** | | The user account is deleted, and a confirmation message is displayed. | |
| **Actual Result:** | | The user account is deleted, and a confirmation message is displayed. | |
| **Status:** | | Pass | |

**Test case 10: Log out**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-10 | **Test Case Designed by:** | alisha |
| **Test Case Title:** | Log out | **Test Case Executed by:** | alisha |
| **Module Name:** | Profile Management | **Test Case Execution Date:** | 17/12/24 |
| **Test Data:** | .No data to be entered | **Priority:** | Low |
| **Precondition:** | | The user is logged in and on the dashboard. | |
| **Steps /Action** | | **System Response** | |
| |  | | --- | | 1. Logged in 2. On the dashboard 3. Tap the "Log Out" button. | | | The system ends the user session and redirects to the login screen. | |
| **Expected Result:** | | The user is logged out successfully and redirected to the login screen. | |
| **Actual Result:** | | The user is logged out successfully and redirected to the login screen. | |
| **Status:** | | Pass | |

## Module 2: Sentiment Engine Analysis

**Test case 1: Feedback Collection from Different Channels**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-01 | **Test Case Designed by:** | alisha |
| **Test Case Title:** | Feedback Collection from Different Channels | **Test Case Executed by:** | alisha |
| **Module Name:** | Sentiment Engine Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | -- | **Priority:** | High |
| **Precondition:** | | Feedback sources (email, social media, chatbots, etc.) are configured. | |
| **Steps /Action** | | **System Response** | |
| |  |  | | --- | --- | | Integrate feedback sources. |  |  |  | | --- | | 2.Collect feedback data. | | | System connects to all specified channels. System retrieves feedback from all sources and stores it. | |
| **Expected Result:** | | Feedback is collected successfully from all configured channels. | |
| **Actual Result:** | | Feedback is collected successfully from all configured channels. | |
| **Status:** | | Pass | |

**Test case 2: Keyword Extraction**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-02 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | **Keyword Extraction** | **Test Case Executed by:** | zubaria |
| **Module Name:** | Sentiment Engine Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | --- | **Priority:** | Medium |
| **Precondition:** | | Feedback data is available in the system.. | |
| **Steps /Action** | | **System Response** | |
| Process feedback text for keyword extraction. | | |  |  | | --- | --- | |  | | |  |  |  | | --- | | System identifies and extracts relevant keywords. |  |  | | --- | |  | | |
| **Expected Result:** | | Keywords are extracted correctly from feedback data. | |
| **Actual Result:** | | Keywords are extracted correctly from feedback data. | |
| **Status:** | | Pass | |

**Test case 3: Sentiment Classification**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-03 | **Test Case Designed by:** | alisha |
| **Test Case Title:** | Sentiment Classification | **Test Case Executed by:** | zubaria |
| **Module Name:** | Sentiment Engine Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Data stored from different channles | **Priority:** | Medium |
| **Precondition:** | | Feedback data and classification model are available. | |
| **Steps /Action** | | **System Response** | |
| Logged in  User click on classify sentiments  Run sentiment analysis on feedback. | | System would evaluate the sentiments  System classifies feedback as positive, negative, or neutral. | |
| **Expected Result:** | | Feedback is classified into appropriate sentiment categories. | |
| **Actual Result:** | | Feedback is classified into appropriate sentiment categories.. | |
| **Status:** | | Pass | |

**Test case 4: Real-Time Sentiments Monitoring**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-04 | **Test Case Designed by:** | alisha |
| **Test Case Title:** | Real-Time Sentiments Monitoring | **Test Case Executed by:** | zubaria |
| **Module Name:** | Sentiment Engine Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Data from different channels | **Priority:** | High |
| **Precondition:** | | Live feedback streams are active. | |
| **Steps /Action** | | **System Response** | |
| User is logged in  Data is being delivered from different platfroms  Enable real-time monitoring. | | System begins tracking incoming feedback sentiment. | |
| **Expected Result:** | | Sentiments are monitored and displayed in real-time. As positive negative and neutral | |
| **Actual Result:** | | Sentiments are monitored and displayed in real-time. | |
| **Status:** | | Pass | |

**Test case 5: Generate Alerts for Negative Sentiments**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-05 | **Test Case Designed by:** | Zubaria |
| **Test Case Title:** | Generate Alerts for Negative Sentiments | **Test Case Executed by:** | Zubaria |
| **Module Name:** | Sentiment Engine Analysis | **Test Case Execution Date:** |  |
| **Test Data:** | --- | **Priority:** | Medium |
| **Precondition:** | | Real-time sentiment monitoring is active. | |
| **Steps /Action** | | **System Response** | |
| * Logged into System * Enable the Real-time sentiment monitoring * Identify negative sentiments in real-time feedback. | | System generates alerts for detected negative sentiments. | |
| **Expected Result:** | | Alerts are generated when negative sentiments are identified. | |
| **Actual Result:** | | Alerts are generated when negative sentiments are identified. | |
| **Status:** | | Pass | |

**Test case 6: Perception Trend Analysis**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-06 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | Analyze Perception Trends | **Test Case Executed by:** | zubaria |
| **Module Name:** | Sentiment Engine Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | --- | **Priority:** | High |
| **Precondition:** | | Sentimental stored data is available. | |
| **Steps /Action** | | **System Response** | |
| * Logged into system * Gather data from different platform * Store data * Process historical sentiment data. | | System analyzes trends in perception over time. | |
| **Expected Result:** | | Trends in sentiment perceptions are accurately identified. | |
| **Actual Result:** | | Trends in sentiment perceptions are accurately identified. | |
| **Status:** | | Pass | |

**Test case 7: Insights Generation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-07 | **Test Case Designed by:** | alisha |
| **Test Case Title:** | Insights Generation | **Test Case Executed by:** | zubaria |
| **Module Name:** | Sentiment Engine Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Sentimental data | **Priority:** | High |
| **Precondition:** | | Analyzed sentiment data is available. | |
| **Steps /Action** | | **System Response** | |
| * Logged into system * Gather data from different platform * Store data * Process analyzed data for insights generation. | | System generates actionable insights based on sentiment data. | |
| **Expected Result:** | | Actionable insights are generated successfully. | |
| **Actual Result:** | | Actionable insights are generated successfully. | |
| **Status:** | | Pass | |

**Test case 8:** Reporting Sentiments

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-08 | **Test Case Designed by:** | alisha |
| **Test Case Title:** | Reporting Sentiments | **Test Case Executed by:** | zubaria |
| **Module Name:** | Sentiment Engine Analysis | **Test Case Execution Date:** | 11/12/23 |
| **Test Data:** | Sentimental data | **Priority:** | |  | | --- | |  |  |  | | --- | | Medium | |
| **Precondition:** | | Sentiment data and insights are available. | |
| **Steps /Action** | | **System Response** | |
| * Logged into system * Gather data from different platform * Store data * Process analyzed data for insights generation * Generate sentiment reports.. | | System generates a visual and textual sentiment report. | |
| **Expected Result:** | | Reports are generated and presented accurately. | |
| **Actual Result:** | | Reports are generated and presented accurately. | |
| **Status:** | | Pass | |

## Module 3: Personalization

We will be testing cases of module 3.

**Table 3.1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-3.1 | **Module Name:** | Personalization |
| **Test Case Title:** | Personalized Product Recommendations | **Requirement Reference ID:** | UC-3.1 |
| **Test Scenario:** | Verify that the system displays personalized product recommendations based on user history. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | User’s purchase history and preferences. | **Release Version:** | 1 |
| **Precondition:** | User has an active profile with browsing history. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to "Personalized Product Recommendations". | 2. System displays personalized product recommendations based on user history. | Product recommendations displayed successfully. |

**Table 3.2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-3.2 | **Module Name:** | Personalization |
| **Test Case Title:** | Real-Time Personalization Offers | **Requirement Reference ID:** | UC-3.2 |
| **Test Scenario:** | Verify that the system generates real-time personalized offers based on user actions. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | User’s browsing session and preferences. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and browsing the site. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Browse products. | 2. System generates real-time personalized offers based on browsing behavior. | Real-time offers displayed successfully. |

**Table 3.3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-3.3 | **Module Name:** | Personalization |
| **Test Case Title:** | Customizable User Preferences | **Requirement Reference ID:** | UC-3.3 |
| **Test Scenario:** | Verify that users can update their preferences for personalized recommendations. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | User preference data. | **Release Version:** | 1 |
| **Precondition:** | User is logged into their account. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Go to "Preferences" and update preferences. | 2. System successfully saves updated preferences for personalized recommendations. | Preferences updated successfully. |

**Table 3.4**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-3.4 | **Module Name:** | Personalization |
| **Test Case Title:** | Personalized Email Campaigns | **Requirement Reference ID:** | UC-3.4 |
| **Test Scenario:** | Verify that personalized email campaigns are sent based on user behavior. | **Test Environment:** | Email Client, Web Browser (Chrome v112) |
| **Test Data:** | User email and campaign preferences. | **Release Version:** | 1 |
| **Precondition:** | User has an active email account and preferences set. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Trigger an email campaign. | 2. System sends a personalized email campaign to the user. | Personalized email campaign sent successfully. |

**Table 3.5**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-3.5 | **Module Name:** | Personalization |
| **Test Case Title:** | Guided Item Navigation | **Requirement Reference ID:** | UC-3.5 |
| **Test Scenario:** | Verify that the system provides guided navigation for finding items. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Search term and product categories. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and browsing. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Search for a product. | 2. System provides guided navigation options based on search term. | Guided navigation options displayed successfully. |

**Table 3.6**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-3.6 | **Module Name:** | Personalization |
| **Test Case Title:** | Predictive Personalization | **Requirement Reference ID:** | UC-3.6 |
| **Test Scenario:** | Verify that predictive personalization works based on user history. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | User’s interaction history. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has interaction history. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to product recommendations. | 2. System provides predictive recommendations based on past behavior. | Predictive recommendations displayed correctly. |

**Table 3.7**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-3.7 | **Module Name:** | Personalization |
| **Test Case Title:** | Dynamic Web Content Display | **Requirement Reference ID:** | UC-3.7 |
| **Test Scenario:** | Verify that the system dynamically updates web content based on user behavior. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | User browsing activity. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and browsing. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Browse products and check content. | 2. System dynamically updates web content based on user interaction. | Web content updated successfully based on browsing. |

**Table 3.8**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-3.8 | **Module Name:** | Personalization |
| **Test Case Title:** | Cross-Selling Recommendations | **Requirement Reference ID:** | UC-3.8 |
| **Test Scenario:** | Verify that the system suggests complementary products based on user’s cart. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | User’s cart data. | **Release Version:** | 1 |
| **Precondition:** | User has items in their cart. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Add items to the cart. | 2. System displays cross-selling recommendations for complementary items. | Cross-selling recommendations displayed successfully. |

## Module 4: Feature and Nodule Extraction:

We will be testing cases of module 4.

**Table 4.1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-4.1 | **Module Name:** | Performance Metrics Dashboard |
| **Test Case Title:** | KPIs Monitoring | **Requirement Reference ID:** | UC-4.1 |
| **Test Scenario:** | Verify that the system displays key performance indicators (KPIs) accurately. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | KPIs data (e.g., sales, conversions). | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to the dashboard. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to KPIs section of the dashboard. | 2. System displays KPIs data (e.g., sales, conversion rates) accurately. | KPIs displayed successfully on the dashboard. |

**Table 4.2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-4.2 | **Module Name:** | Performance Metrics Dashboard |
| **Test Case Title:** | Customer Retention Tracking | **Requirement Reference ID:** | UC-4.2 |
| **Test Scenario:** | Verify that the system tracks customer retention rates. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Customer retention data. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to customer data. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to retention tracking section. | 2. System displays customer retention data accurately. | Customer retention data displayed successfully. |

**Table 4.3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-4.3 | **Module Name:** | Performance Metrics Dashboard |
| **Test Case Title:** | Real-Time Performance Monitoring | **Requirement Reference ID:** | UC-4.3 |
| **Test Scenario:** | Verify that the system displays real-time performance data. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Real-time performance metrics. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to the dashboard. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to real-time performance monitoring section. | 2. System displays real-time performance data on the dashboard. | Real-time performance data displayed successfully. |

**Table 4.4**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-4.4 | **Module Name:** | Performance MetricsDashboard |
| **Test Case Title:** | Churn Rate Analysis | **Requirement Reference ID:** | UC-4.4 |
| **Test Scenario:** | Verify that the system analyzes and displays customer churn rates. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Churn rate data from user interactions. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to churn rate data. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to churn rate analysis section. | 2. System displays churn rate data and analysis. | Churn rate analysis displayed successfully. |

**Table 4.5**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-4.5 | **Module Name:** | Performance Metrics Dashboard |
| **Test Case Title:** | Metrics Comparison Over Time | **Requirement Reference ID:** | UC-4.5 |
| **Test Scenario:** | Verify that the system allows comparing performance metrics over different time periods. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Metrics data across time periods. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to historical data. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to metrics comparison section. | 2. System displays performance metrics comparison over time periods. | Metrics comparison over time displayed successfully. |

**Table 4.6**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-4.6 | **Module Name:** | Performance Metrics Dashboard |
| **Test Case Title:** | Areas for Improvement Identification | **Requirement Reference ID:** | UC-4.6 |
| **Test Scenario:** | Verify that the system identifies and highlights areas for improvement. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Performance data requiring analysis. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to performance metrics. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the "Areas for Improvement" section. | 2. System identifies and displays areas needing improvement based on metrics. | Areas for improvement displayed successfully. |

**Table 4.7**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-4.7 | **Module Name:** | Performance Metrics Dashboard |
| **Test Case Title:** | Performance Reports Generation | **Requirement Reference ID:** | UC-4.7 |
| **Test Scenario:** | Verify that the system generates performance reports. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Sample performance metrics data. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to reporting tools. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the "Reports" section. | 2. System generates performance reports based on selected metrics. | Performance reports generated successfully. |

**Table 4.8**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-4.8 | **Module Name:** | Performance Metrics Dashboard |
| **Test Case Title:** | Dashboard Visualization of Metrics | **Requirement Reference ID:** | UC-4.8 |
| **Test Scenario:** | Verify that performance metrics are visualized correctly on the dashboard. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Metrics data for visualization. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to the dashboard. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the dashboard. | 2. System visualizes performance metrics in graphical formats (e.g., charts, graphs). | Metrics visualized successfully on the dashboard. |

## Module 5: Customer Interaction Analysis

We will be testing cases of module 5.

**Test case1: Data Gathering from Different Channels**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-01 | **Test Case Designed by:** | alisha |
| **Test Case Title:** | Data Gathering from Different Channels | **Test Case Executed by:** | zubaria |
| **Module Name:** | Customer Interaction Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | API keys, endpoints for platforms (Email, Social Media, Chatbots). | **Priority:** | High |
| **Precondition:** | | The user is logged in to the app with valid credentials.  The device has a stable internet connection.  Platforms are configured with valid credentials and accessible APIs. | |
| **Steps /Action** | | **System Response** | |
| |  | | --- | | 1. Log into the system as an authorized user. | | 1. Navigate to the "Customer Interaction" section. 2. Select all platforms to enable data gathering. 3. Verify connection status for each platform. 4. data import completion. | |  | | | 1. The system verifies user credentials and grants access. 2. The system displays available platforms for data gathering. 3. The system connects to each platform and begins retrieving data. 4. The system notifies the user when all data is successfully gathered. | |
| **Expected Result:** | | Data is retrieved from all platforms without errors.  Any connection issues are flagged with detailed messages. | |
| **Actual Result:** | | Data gathered successfully | |
| **Status:** | | Pass | |

**Test case2 : Data Analysis Insights**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-02 | **Test Case Designed by:** | Alisha |
| **Test Case Title:** | **Data Analysis Insights** | **Test Case Executed by:** | zubaria |
| **Module Name:** | Customer Interaction Analysis | **Test Case Execution Date:** | 17/12/24 |
| **Test Data:** | Interaction data from multiple channels. | **Priority:** | Medium |
| **Precondition:** | | The device has a stable internet connection.  Data is successfully gathered and available for analysis. | |
| **Steps /Action** | | **System Response** | |
| |  |  | | --- | --- | | 1. Log into the system 2. navigate to the "Analysis" section. 3. View the generated insights summary. | 1. The system loads the data analysis dashboard. | | | The system loads the data analysis dashboard.  The system processes the data and generates insights.  Insights are displayed, including trends, key metrics. | |
| **Expected Result:** | | Analysis results are generated without errors.  Insights accurately summarize customer interaction trends. | |
| **Actual Result:** | | Analysis done | |
| **Status:** | | Pass | |

**Test case 3: Customer Segmentation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-03 | **Test Case Designed by:** | Alisha |
| **Test Case Title:** | Customer Segmentation | **Test Case Executed by:** | zubaria |
| **Module Name:** | Customer Interaction Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Data of customer stored from different platforms | **Priority:** | Medium |
| **Precondition:** | | 1. . Data is analyzed 2. segmentation criteria are defined. | |
| **Steps /Action** | | **System Response** | |
| 1. Navigate to customer segmentation 2. Choose segmentation criteria on basis of location or else 3. Show segmented groups | | 1. Logged in 2. Display segmented option 3. The system displays customers grouped based on the criteria. | |
| **Expected Result:** | | Customers are grouped accurately based on the selected criteria. | |
| **Actual Result:** | | Customers successfully segmented. | |
| **Status:** | | Pass | |

**Test case 4: Data Storage for Decision Making**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-04 | **Test Case Designed by:** | Alisha |
| **Test Case Title:** | Data Storage for Decision Making | **Test Case Executed by:** | Alisha |
| **Module Name:** | Customer Interaction Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Analyzed data. | **Priority:** | High |
| **Precondition:** | | Data analysis is completed. | |
| **Steps /Action** | | **System Response** | |
| 1. Data is stored 2. Data is analyzed 3. Insights generated for decision making | | 1. The system loads the storage option 2. The system displays available database 3. Data is analyzed | |
| **Expected Result:** | | Data is saved securely and analyzed for future use.. | |
| **Actual Result:** | | Data saved successfully. | |
| **Status:** | | Pass | |

**Test case 5 : Behavior Tracking**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-05 | **Test Case Designed by:** | Alisha |
| **Test Case Title:** | Behavior Tracking | **Test Case Executed by:** | zubaria |
| **Module Name:** | Customer Interaction Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Customer interaction patterns, clickstream data. | **Priority:** | High |
| **Precondition:** | | Data is gathered and ready for behavioral analysis. | |
| **Steps /Action** | | **System Response** | |
| Navigate to the "Behavior Tracking" section  Select the behavior to be analyzed. | | The system displays tracking options and configuration.  System analyze behavior of customer | |
| **Expected Result:** | | Real-time customer behavior is tracked and logged without issues.  Insights are generated based on tracked behavior. | |
| **Actual Result:** | | (To be filled in after executing the test) | |
| **Status:** | | Pass | |

**Test case 6 : Recommendations**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-06 | **Test Case Designed by:** | zubaria |
| **Test Case Title:** | Recommendations | **Test Case Executed by:** | Alisha |
| **Module Name:** | Customer Interaction Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Behavior tracking data, preferences. | **Priority:** | Medium |
| **Precondition:** | | .Data is tracked and insights are available | |
| **Steps /Action** | | **System Response** | |
| Use Recommendation sections  Data insights are available  Recommendation generated | | The system loads the recommendation engine  The system applies criteria.  The system displays personalized suggestions for customers. | |
| **Expected Result:** | | Accurate and relevant recommendations are generated for customers. | |
| **Actual Result:** | | Recommendations successfully generated. | |
| **Status:** | | pass | |

**Test case 7: Opportunity Identification**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-07 | **Test Case Designed by:** | Alisha |
| **Test Case Title:** | Opportunity Identification | **Test Case Executed by:** | Alisha |
| **Module Name:** | . Customer Interaction Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Behavior tracking data, preferences. | **Priority:** | Medium |
| **Precondition:** | | Data analysis and segmentation are completed. | |
| **Steps /Action** | | **System Response** | |
| 1. Use Opportunity sections 2. Initiate the opportunity identification process. | | 1. The system displays available data for analysis. 2. The system applies criteria. 3. Opportunities are identified through insights | |
| **Expected Result:** | | Opportunities are identified accurately based on data insights. | |
| **Actual Result:** | | Opportunities are identified successfully | |
| **Status:** | | pass | |

**Test case 8: Reporting Customer Interactions**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-08 | **Test Case Designed by:** | Alisha |
| **Test Case Title:** | Reporting Customer Interactions | **Test Case Executed by:** | Alisha |
| **Module Name:** | Customer Interaction Analysis | **Test Case Execution Date:** | 17/12/23 |
| **Test Data:** | Data insights | **Priority:** | Medium |
| **Precondition:** | | Insights are generated | |
| **Steps /Action** | | **System Response** | |
| Data is stored  Insights are generated.  Generate the report.  Share report. | | System display report options  Applies the selected criteria  Report generated. | |
| **Expected Result:** | | Reports are generated accurately based on interaction data.  Reports are exportable and easy to share. | |
| **Actual Result:** | | Reports successfully generated and exported. | |
| **Status:** | | pass | |

## Module 6: Customer Journey Map

**Testcase 1: Create Journey Map**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-01 | **Test Case Designed by:** | alisha |
| **Test Case Title:** | Create Journey Map | **Test Case Executed by:** | alisha |
| **Module Name:** | Customer Journey Map | **Test Case Execution Date:** |  |
| **Test Data:** | Interaction history, touchpoints, and customer feedback. | **Priority:** | High |
| **Precondition:** | | . Interaction data from different channels is available. | |
| **Steps /Action** | | **System Response** | |
| 1. Navigate to the Create Journey Map section. 2. Input customer details and interaction data. 3. Define key touchpoints and phases. 4. Save the journey map. | | 1. The system displays the journey map creation interface. 2. Customer details and interactions are successfully recorded. 3. Key touchpoints and phases are highlighted on the map. 4. A confirmation message is displayed, and the journey map is saved. | |
| **Expected Result:** | | A detailed customer journey map is created and saved successfully. | |
| **Actual Result:** | | A detailed customer journey map is created and saved successfully. | |
| **Status:** | | Pass | |

**Testcase 3: Update Customer Journey Map**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-02 | **Test Case Designed by:** | Alisha |
| **Test Case Title:** | Update Customer Journey Map | **Test Case Executed by:** | Alisha |
| **Module Name:** | Customer Journey Map | **Test Case Execution Date:** |  |
| **Test Data:** | Updated customer interactions and touchpoints. | **Priority:** | High |
| **Precondition:** | | . A customer journey map exists. | |
| **Steps /Action** | | **System Response** | |
| 1. Navigate to the existing customer journey map. 2. Select the "Edit" option. 3. Update customer details and touchpoints. 4. Save the changes. | | 1. The system loads the existing journey map. 2. The edit interface is displayed. 3. Updated details are reflected in real-time. 4. A confirmation message is displayed, and changes are saved. | |
| **Expected Result:** | | The journey map is updated with the latest details successfully. | |
| **Actual Result:** | | The journey map is updated with the latest details successfully. | |
| **Status:** | | Pass | |

**Testcase 4: Identify Pain Points**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-04 | **Test Case Designed by:** | Warda Irfan |
| **Test Case Title:** | Identify Pain Points | **Test Case Executed by:** | Alisha |
| **Module Name:** | Customer Journey Map | **Test Case Execution Date:** |  |
| **Test Data:** | Customer complaints, low engagement areas. | **Priority:** | Medium |
| **Precondition:** | | A customer journey map is available for analysis. | |
| **Steps /Action** | | **System Response** | |
| 1. Navigate to the "Pain Points" section in the journey map. 2. Analyze touchpoints with negative feedback or low engagement. 3. Highlight the identified pain points. | | 1. The system loads the analysis tools. 2. Negative feedback and low engagement areas are identified. 3. Pain points are highlighted on the journey map. | |
| **Expected Result:** | | Pain points are identified and marked on the map. | |
| **Actual Result:** | | . Pain points are identified and marked on the map. | |
| **Status:** | | Pass | |

**Testcase 5: Analyze Customer Journey Map**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-05 | **Test Case Designed by:** | Alisha Ejaz |
| **Test Case Title:** | Analyze Customer Journey Map | **Test Case Executed by:** | Alisha Ejaz |
| **Module Name:** | Customer Journey Map | **Test Case Execution Date:** | 20/12/2023 |
| **Test Data:** | Journey map, interaction data, and feedback trends. | **Priority:** | High |
| **Precondition:** | | A complete journey map is available. | |
| **Steps /Action** | | **System Response** | |
| 1. Navigate to the Analysis section. 2. Select analysis criteria (e.g., engagement, satisfaction). 3. View the generated insights. | | * The system displays the analysis interface. * Insights based on the selected criteria are generated. * Results are displayed in charts and graphs. | |
| **Expected Result:** | | . The system provides detailed insights from the customer journey map. | |
| **Actual Result:** | | The system provides detailed insights from the customer journey map. | |
| **Status:** | | Pass | |

**Testcase 6: Share Customer Journey Map**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-06 | **Test Case Designed by:** | Alisha Ejaz |
| **Test Case Title:** | **ShareCustomer Journey Map** | **Test Case Executed by:** | Alisha |
| **Module Name:** | Customer Journey Map | **Test Case Execution Date:** | 20/12/2023 |
| **Test Data:** | Email addresses or sharing platform details. | **Priority:** | High |
| **Precondition:** | | . A saved customer journey map exists. | |
| **Steps /Action** | | **System Response** | |
| 1. Navigate to the journey map sharing options. 2. Select the sharing method (e.g., email, link generation). 3. Input recipient details. 4. Share the journey map. | | The system displays sharing options.  The chosen method is applied successfully.  The recipient receives the shared journey map. | |
| **Expected Result:** | | The journey map is shared successfully using the selected method. | |
| **Actual Result:** | | The journey map is shared successfully using the selected method. | |
| **Status:** | | Pass | |

## Module 7: Reward and Loyalty Programs

We will be testing cases of module 7.

**Table 7.1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-7.1 | **Module Name:** | Loyalty and Reward Program |
| **Test Case Title:** | Loyalty Program Creation | **Requirement Reference ID:** | UC-7.1 |
| **Test Scenario:** | Verify that the system allows the creation of new loyalty programs. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | New loyalty program details. | **Release Version:** | 1 |
| **Precondition:** | User is logged in as an admin. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the "Create Loyalty Program" section. | 2. System displays a form to create a new loyalty program. | Form displayed successfully. |
| 3. Enter loyalty program details and submit. | 3. System saves the loyalty program and confirms its creation. | Loyalty program created successfully. |

**Table 7.2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-7.2 | **Module Name:** | Loyalty and Reward Program |
| Test Case Title: | Customer Loyalty Tracking | Requirement Reference ID: | UC-7.2 |
| Test Scenario: | Verify that the system tracks customer loyalty accurately. | Test Environment: | Web Browser (Chrome v112) |
| Test Data: | Customer loyalty data. | Release Version: | 1 |
| Precondition: | Customer has an active loyalty program. | Priority: | High |
| Date of Creation: | 16-05-2024 | Created By: | Rai Sardar |
| Executed By: | Rai Sardar | Date of Execution: | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the "Loyalty Tracking" section. | 2. System displays customer loyalty data (e.g., loyalty points). | Loyalty data displayed successfully. |
| 3. Filter customer data by program or timeframe. | 3. System filters and displays the requested loyalty data. | Loyalty tracking works as expected. |

**Table 7.3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-7.3 | **Module Name:** | Loyalty and Reward Program |
| **Test Case Title:** | Reward Points Allocation | **Requirement Reference ID:** | UC-7.3 |
| **Test Scenario:** | Verify that the system allocates reward points correctly for customer purchases. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Purchase details and loyalty rules. | **Release Version:** | 1 |
| **Precondition:** | Customer has a valid loyalty program. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a customer. | 1. Customer logged in successfully. | Customer logged in successfully. | Pass |
| 2. Complete a purchase that qualifies for reward points. | 2. System calculates and allocates reward points according to program rules. | Reward points allocated correctly. |
| 3. Verify reward points in the customer profile. | 3. System displays updated reward points in the customer’s profile. | Reward points displayed correctly. |

**Table 7.4**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-7.4 | **Module Name:** | Loyalty and RewardProgram |
| **Test Case Title:** | Notify Customers of Loyalty Status | **Requirement Reference ID:** | UC-7.4 |
| **Test Scenario:** | Verify that the system sends loyalty status notifications to customers. | **Test Environment:** | Email Client (Gmail) |
| **Test Data:** | Customer email and loyalty status. | **Release Version:** | 1 |
| **Precondition:** | Customer has an active loyalty account. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the "Notifications" section. | 2. System allows the admin to configure loyalty status notifications. | Notifications configured successfully. |
| 3. Send notification to customers. | 3. Customers receive loyalty status notifications via email. | Notifications sent successfully. |

**Table 7.5**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-7.5 | **Module Name:** | Loyalty and Reward Program |
| **Test Case Title:** | Personalized Offers for Loyal Customers | **Requirement Reference ID:** | UC-7.5 |
| **Test Scenario:** | Verify that the system generates personalized offers for loyal customers. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Customer loyalty level and preferences. | **Release Version:** | 1 |
| **Precondition:** | Customer has an active loyalty program account. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a customer. | 1. Customer logged in successfully. | Customer logged in successfully. | Pass |
| 2. Check for personalized offers on the dashboard. | 2. System displays personalized offers tailored to the customer’s loyalty level and preferences. | Offers displayed successfully. |
| 3. Redeem one of the personalized offers. | 3. System processes the offer redemption and updates customer data. | Offer redeemed successfully. |

**Table 7.6**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-7.6 | **Module Name:** | Loyalty and Reward Program |
| **Test Case Title:** | Loyalty Program Effectiveness Analysis | **Requirement Reference ID:** | UC-7.6 |
| **Test Scenario:** | Verify that the system analyzes and displays the effectiveness of loyalty programs. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Program data and customer engagement metrics. | **Release Version:** | 1 |
| **Precondition:** | Admin has access to program data. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | Admin user logged in successfully. | Pass |
| 2. Navigate to the "Effectiveness Analysis" section. | 2. System displays loyalty program data with metrics (e.g., customer engagement, ROI). | Effectiveness analysis displayed successfully. |
| 3. Export the analysis report. | 3. System generates and exports the analysis report in PDF format. | Report exported successfully. |

**Table 7.7**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-7.7 | **Module Name:** | Loyalty and Reward Program |
| **Test Case Title:** | Loyalty Reports Generation | **Requirement Reference ID:** | UC-7.7 |
| **Test Scenario:** | Verify that the system generates loyalty program reports. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Program data and report parameters. | **Release Version:** | 1 |
| **Precondition:** | Admin has access to reporting tools. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | Admin user logged in successfully. | Pass |
| 2. Navigate to the "Reports" section. | 2. System displays report generation options for loyalty programs. | Report generation options displayed successfully. |
| 3. Generate a loyalty program report. | 3. System processes the request and generates the report in the specified format. | Loyalty program report generated successfully. |

**Table 7.8**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-7.8 | **Module Name:** | Loyalty and Reward Program |
| **Test Case Title:** | Loyalty Program Integration with Sales Data | **Requirement Reference ID:** | UC-7.8 |
| **Test Scenario:** | Verify that the loyalty program integrates correctly with sales data. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Sales and loyalty program data. | **Release Version:** | 1 |
| **Precondition:** | Admin has access to sales and loyalty data. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | Admin user logged in successfully. | Pass |
| 2. Navigate to the integration settings. | 2. System displays integration options for sales and loyalty data. | Integration options displayed successfully. |
| 3. Enable integration and verify data sync. | 3. System integrates sales and loyalty program data and syncs them correctly. | Integration completed successfully. |

## Module 8: Pricing and Subscription

We will be testing cases of module 8.

**Table 8.1**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-8.1 | **Module Name:** | Pricing and Subscription |
| **Test Case Title:** | VR-Based Subscription Offering | **Requirement Reference ID:** | UC-8.1 |
| **Test Scenario:** | Verify that the system allows customers to subscribe to VR-based offerings. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Subscription details for VR offerings. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and has access to VR content. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the "VR Subscriptions" section. | 2. System displays available VR-based subscription plans. | Plans displayed successfully. |
| 3. Subscribe to a plan and confirm payment. | 3. System processes the subscription and confirms successful enrollment. | Subscription processed successfully. |

**Table 8.2**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-8.2 | **Module Name:** | Pricing and Subscription |
| **Test Case Title:** | Subscription Tier Management | **Requirement Reference ID:** | UC-8.2 |
| **Test Scenario:** | Verify that the system allows admin users to manage subscription tiers. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Subscription tier details. | **Release Version:** | 1 |
| **Precondition:** | Admin has access to subscription tier settings. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | Admin user logged in successfully. | Pass |
| 2. Navigate to the "Subscription Tiers" section. | 2. System displays a list of subscription tiers. | Tiers displayed successfully. |
| 3. Add, edit, or delete a subscription tier. | 3. System processes the requested action and updates subscription tier settings. | Subscription tier updated successfully. |

**Table 8.3**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-8.3 | **Module Name:** | Pricing and Subscription |
| **Test Case Title:** | Notify Customers of Special Discounts | **Requirement Reference ID:** | UC-8.3 |
| **Test Scenario:** | Verify that the system notifies customers of special discounts via email. | **Test Environment:** | Email Client (Gmail) |
| **Test Data:** | Discount email content. | **Release Version:** | 1 |
| **Precondition:** | Customers are subscribed to receive notifications. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | Admin user logged in successfully. | Pass |
| 2. Create a special discount campaign. | 2. System allows admin to configure discount details and target customers. | Discount campaign configured successfully. |
| 3. Notify customers via email. | 3. Customers receive email notifications with discount details. | Emails sent successfully. |

**Table 8.4**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-8.4 | **Module Name:** | Pricing and Subscription |
| **Test Case Title:** | Subscription Benefits Display | **Requirement Reference ID:** | UC-8.4 |
| **Test Scenario:** | Verify that the system displays the benefits of each subscription tier. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Subscription benefits for each tier. | **Release Version:** | 1 |
| **Precondition:** | User is logged in and browsing subscription tiers. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the "Subscription Benefits" section. | 2. System displays the benefits of each subscription tier. | Benefits displayed successfully. |
| 3. Select a subscription to view detailed benefits. | 3. System provides detailed benefits for the selected subscription. | Detailed benefits displayed successfully. |

**Table 8.5**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-8.5 | **Module Name:** | Pricing and Subscription |
| **Test Case Title:** | Subscription Metrics Analysis | **Requirement Reference ID:** | UC-8.5 |
| **Test Scenario:** | Verify that the system analyzes subscription metrics and provides insights. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Subscription metrics data. | **Release Version:** | 1 |
| **Precondition:** | Admin has access to subscription data. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | Admin user logged in successfully. | Pass |
| 2. Navigate to the "Subscription Metrics" section. | 2. System displays subscription metrics data. | Metrics displayed successfully. |
| 3. Generate an insights report. | 3. System generates an analysis report with actionable insights. | Insights report generated successfully. |

**Table 8.6**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-8.6 | **Module Name:** | Pricing and Subscription |
| **Test Case Title:** | Automated Renewal Notifications | **Requirement Reference ID:** | UC-8.6 |
| **Test Scenario:** | Verify that the system sends automated renewal notifications to customers. | **Test Environment:** | Email Client (Gmail) |
| **Test Data:** | Customer email and subscription renewal data. | **Release Version:** | 1 |
| **Precondition:** | Customer has an active subscription. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as an admin user. | 1. Admin user logged in successfully. | Admin logged in successfully. | Pass |
| 2. Configure automated renewal notifications. | 2. System allows admin to set up renewal reminders for customers. | Renewal notifications configuration displayed successfully. |
| 3. Verify customer receives a renewal reminder. | 3. Customer receives an email reminder about subscription renewal. | Renewal notification sent successfully. |

**Table 8.7**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-8.7 | **Module Name:** | Pricing and Subscription |
| **Test Case Title:** | Seamless Payment System Integration | **Requirement Reference ID:** | UC-8.7 |
| **Test Scenario:** | Verify that the payment system integrates seamlessly with the subscription platform. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Payment method details. | **Release Version:** | 1 |
| **Precondition:** | User has a valid payment method linked to their account. | **Priority:** | High |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the payment section. | 2. System displays available payment methods for subscription. | Payment options displayed successfully. |
| 3. Complete a payment transaction for a subscription. | 3. System processes the payment and confirms successful subscription. | Payment processed successfully and subscription confirmed. |

**Table 8.8**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Id:** | TC-8.8 | **Module Name:** | Pricing and Subscription |
| **Test Case Title:** | 24/7 Subscriber Support | **Requirement Reference ID:** | UC-8.8 |
| **Test Scenario:** | Verify that the system provides 24/7 customer support for subscribers. | **Test Environment:** | Web Browser (Chrome v112) |
| **Test Data:** | Customer query details. | **Release Version:** | 1 |
| **Precondition:** | Customer has an active subscription. | **Priority:** | Medium |
| **Date of Creation:** | 16-05-2024 | **Created By:** | Rai Sardar |
| **Executed By:** | Rai Sardar | **Date of Execution:** | 16-05-2024 |
| **Test Steps** | **Expected Results** | **Actual Results** | **Status** |
| 1. Log in as a registered user. | 1. User logged in successfully. | User logged in successfully. | Pass |
| 2. Navigate to the support section. | 2. System provides options to contact 24/7 support (e.g., live chat, email). | Support options displayed successfully. |
| 3. Submit a support ticket for an issue. | 3. System confirms the submission and promises 24/7 support response. | Support ticket submitted successfully. |

## 

## Environmental Needs

The following environmental needs are crucial for the successful execution of our test plan:

1. Stable internet connectivity for mobile and web testing.
2. Access to devices with **Android 8+** or **iOS 12+**.
3. Supported web browsers: **Chrome v112**, **Firefox v100**, **Edge v90**, or higher.
4. Fully functional access to the AI-Customer Experience platform.
5. Integration with sentiment analysis NLP systems.
6. Access to customer interaction datasets for analysis.
7. High-performance processors (**Intel i5, Gen 4+**) for resource-intensive modules.
8. Database access for testing **Customer Interaction Analytics** and **Subscription Data**.
9. Real-time dashboards for visualizing KPIs and metrics during testing.

# Conclusion and Future Work

This chapter concludes the project and highlights future work.



## Conclusion

The "AI-Driven Customer Experience Management (CEM) Platform" leverages AI and VR to enhance customer interactions by providing real-time sentiment analysis, personalized recommendations, and immersive training tools. Scalable solutions for managing multi-channel interactions, enhancing client retention, and obtaining actionable insights are made possible by its modular design. Advanced VR modules, improved AI models, and interaction with cutting-edge technology are possible future improvements. The platform highlights the revolutionary potential of AI-powered solutions in maintaining competitive advantage and cultivating deep connections with customers.

## Future Work

The platform lays a robust foundation for further enhancements. Future iterations could include:

1. **Enhanced VR Training Modules**: Developing more complex and immersive VR scenarios to address a broader range of customer service challenges.
2. **AI Model Refinement**: Incorporating more sophisticated machine learning algorithms to improve the accuracy of sentiment analysis and predictive recommendations.
3. **Cross-Platform Compatibility**: Expanding support for additional communication channels like voice assistants and emerging social media platforms.
4. **Integration with IoT Devices**: Utilizing IoT sensors to capture real-time customer behavior in physical spaces.
5. **Advanced Data Visualization**: Improving dashboard analytics with more interactive and customizable visual tools.

# Work Summary and Reviews

## Lesson Learnt.

* **Write all lessons that your learnt while doing this semester project**
* **Write both aspects Technical and Non-Technical.**
* **Each Group Member write its own lesson learn as well.**

**Table 6: Lesson Learnt for the course project**

|  |  |
| --- | --- |
|  | **Lesson Learned** |
| **Student 1 Name:**  Rai Sardar Ahmed  **Student 1 Registration Number:**  FA23-BSE-120 | Through the course of this project, I gained significant insights into approaching software systems with a structured and effective methodology. I also learned various tools such as Figma, Jira, and others, which have enhanced my ability to design and manage projects efficiently. Additionally, I developed a deeper understanding of creating comprehensive software documentation |
| **Student 2 Name:**  Alisha Ejaz  **Student 2 Registration Number:**  FA23-BSE-122 | This project provided me with valuable experience in tackling software system development from a practical and collaborative perspective. I gained hands-on expertise with tools like Figma and Jira, which streamlined both the design and management aspects of the project. Working on this platform also improved my ability to create structured and precise software documentation, equipping me with skills that will undoubtedly benefit future endeavors in software engineering. |

## Work Break Down

**Table 7: Work Break down of individual student for each milestone.**

|  |  |  |
| --- | --- | --- |
| **Milestones** | **Student 1**  **Rai Sardar Ahmed (FA23-BSE-120)** | **Student 2 Name**  **Alisha Ejaz (FA23-BSE-122)** |
| 1. SCOPE Document and   SCOPE presentation | Module 3, 5, 7, 8 | Module 1, 2, 5, 6 |
| 1. SRS Document and SRS Presentation | Gather requirements with respect to respective modules | Gather requirements with respect to respective modules |
| 1. SDS Document and SDS Presentation | Make usecase diagram ,data flow diagram, class diagram, context diagram, sequence diagram of respective modules​ | Make usecase diagram ,data flow diagram, class diagram, context diagram, sequence diagram of respective modules​ |
| 1. Project Design (Figma and Implementation) | Figma design and Implementtion of 3, 4, 7, 8 | Figma design and Implementtion of 1, 2, 5, 6 |
| 1. Project Test Plan and Presentation | Testing each usecase of respective module | Testing each usecase of respective module |
| 1. Project Final Report and Presentation | Project Documentation | Project Presentation |
|  | | |

## Reviews Details

**Review Given By**:

**Table 7: Work Break down of individual student for each milestone.**

|  |  |  |
| --- | --- | --- |
| **Milestones** | **Muhammad Huzaifa**  **FA23-BSE-072** | **Kashaf Farooq**  **FA23-BSE-124** |
| **SCOPE Document and**  **SCOPE presentation** | Document is well made and has different modules being proposed so they can be used in the SDLC | The Scope document is well presented and well made with all the outlines taken into consideration |
| **SRS Document and SRS Presentation** | Document has presented the modules and being proposed so they can be used in the SDLC | Modules are well as Tabular Use case Tables, are well made and FR tables are also well made |
| **SDS Document and SDS Presentation** | SDS document has diagrams actor wise and contains different diagrams as per requirement | SDS document is well made with diagrams being considered |
| **Project Design (Figma and Implementation)** | The design is quite great however the implementation needs some improvement | The implementations and Figma diagrams are well made |
| **Project Test Plan and Presentation** | TCs are descriptive and show steps to test a use case working properly | The Test Plan has Tested all the Use Cases and has mention the environmental needs for the software making it fool proof |
| **Project Final Report and Presentation** | The whole document is well made, the software documentation has been worked hard on and the whole documentations | The whole document is well made, the software documentation has been worked hard on and the whole documentations |
| **Feedback and Acceptance status of Reviewer Comments** | | |
| **Accepted** | | |

# References

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* **The Impact of AI on Customer Loyalty and Retention**
* [**Cătălina Mărcuță**](https://moldstud.com/authors/catalina-marcuta)**& MoldStud Research Team, The Impact of AI on Customer Loyalty and Retention** [**https://moldstud.com/articles/p-the-impact-of-ai-on-customer-loyalty-and-retention**](https://moldstud.com/articles/p-the-impact-of-ai-on-customer-loyalty-and-retention)**,18/10/2024. (web site)**

# Appendix I

* How to design using UML (OOP): For guidance please follow the instructions mentioned in the link: http://agilemodeling.com/artifacts/
* How and when to design ER diagrams: For guidance please follow the instructions mentioned in the link:

<http://people.inf.elte.hu/nikovits/DB2/Ullman_The_Complete_Book.pdf>

* Data flow diagrams: For guidance please follow the instructions mentioned in the link and book:
  + http://www.agilemodeling.com/artifacts/dataFlowDiagram.htm
  + Software Engineering –A Practitioner’s approach by Roger Pressman
* Architecture diagram: For guidance please follow the instructions mentioned in the link and book:
  + Ian Sommerville – Software Engineering 9th Edition– Chapter 6

# Plaragism Report (Mandatory)

Not provided by library staff