# **Chapter 2: Analysis**

# **2.1 Introduction to Analysis**

Analysis is the second phase of the SDLC. This is performed after the planning phase. This phase is where the actual project lifecycle begins. This phase acts as the bridge between Planning and Design. After completing the planning phase, analysis phase begins and this phase is driven according to the plan. In this phase, we break down the deliverables in Project into the more detailed business requirements. The Analysis Phase is also the part of the project where we will identify the overall direction that the project will take through the creation of the project strategy documents. In this phase, we will study and determine the system requirements.  This helps to determine and understand what the customer wants from the project. This process consists of a group of repeatable processes that utilize certain techniques to capture, document, communicate, and manage requirements. This will be the main focus point of this phase.

Our objectives in the analysis phases can be listed as below:

* To determine and document how the current system works.
* To determine how the system can perform better.
* To develop a logical or business model of the new system/project.
* To make recommendations for improvement.

The three major steps to achieve the above objectives are as follows:

* Determine the system requirements
* Analyze the system requirements
* Evaluate the alternative solutions

At last, an optional document is created that helps transition from the Analysis Phase to the more technical and detailed Design Phase. This document, also known as Conceptual System Design, provides client feedback into many of the ways that the final solution will be implemented. This feedback includes much of the look-and-feel of the final solution.

# **2.2 Methodology**

# **2.3 Feasibility Study**

First of all, feasibility study refers to the analysis and evaluation of a proposed project to determine if it is technically possible, is possible within the estimated cost/budget, and will be profitable. It examines the practicability of any proposed projects or ideas. The main purpose of the feasibility study is to determine the project will continue or not.

The importance of the feasibility study can be shown as below:

* Shows how realistic your proposed project is.
* Helps to define goals.
* Determine the scope.
* Helps in plan development.
* Helps in plan execution.

# **2.4 Requirement Analysis**

## **2.4.1 Functional Requirement**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **Title** | **Description** | **Rational** | **Dependencies** |
| F1 | Database connection | Database connection means allowing system to interact with database. | To perform CRUD function | N/A |
| F2 | User Registration | Registration means registering the new user to the system to access the system. | To create new user | F1 |
| F3 | User login | Login is the entering of identifier info into system for accessing the system. | To access the system | F2 |
| F4 | Logout | Logout means to end the access to the system voluntarily. | To avoid security issues | F3 |
| F5 | Payment |  |  | F3 |
| F6 | Authentication | Authentication means identifying individual who is logging in. | To avoid unauthorized access to the system | F1 |
| F7 | Add buses | Only admin can add new buses in the system | To add new buses | F3 |
| F8 | Remove buses | Only admin can remove buses from the system | To delete buses | F3 |
| F9 | Update bus details | Only admin can update the bus details | To update bus details | F3 |
| F10 | Add route | Only admin can add route in the system | To add route | F3 |
| F11 | Remove routes | Only admin can remove the route from the system | To delete routes | F3 |
| F12 | Update route details | Only admin can update route details in the system | To update route details | F3 |
| F13 | Viewing bus details | Both admin and general users can view the bus details | To view the bus details | F3 |
| F14 | Searching routes | This function helps users to get their desired routes. | To search routes | F3 |
| F15 | Seat viewing | User can view whether seat is booked or available | To view seat details | F3 |
| F16 | Seat Booking | User can select available seats and book them. | To book seat | F3 |
| F17 | Cancel reservation (only available for admin) | Only admin can cancel the reservation as per user request | To cancel the reservation | F3 |

## **2.4.2 Non-functional Requirement**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **Title** | **Description** | **Rational** | **Dependencies** |
| N1 | Performance | System should have quick response time. | To make user more satisfied | N/A |
| N2 | Scalability | System should function well as user increases. | To handle the large number of the user effectively | N/A |
| N3 | Recoverability | System should be able to recover from a crash | To avoid effects of the possible threats of the system | N/A |
| N4 | Availability | System should be available anytime. | To provide better facility to the users | N/A |
| N5 | Reliability | System is expected to provide reliable data to user | To build trust within the users and good relation with them | N/A |
| N6 | Maintainability | System should be designed in such way that it can be maintained on a regular basis. | To ensure the condition of the system and improve the system | N/A |
| N7 | Security | System must have data security and have proper access control | To maintain data security and avoid unauthorized access | F2, F3 |
| N8 | Usability | System should be easy to learn and operate. | To make more user friendly | N/A |
| N9 | Interoperability | System should be designed in such way that it can work in integration with different systems. | To enhance the functionality of the system | N/A |
| N10 | Serviceability | Technical supports should be provided to install, configure and monitor system and other related facilities should be provided. | To make easy for the user to cope up with the system | N/A |
| N11 | Manageability | System should be easy to manage. | To ensure healthy monitoring, logging and alerting | N/A |
| N12 | Legal | System must be legal in the country. | To work in the market legally | N/A |
| N13 | Capacity | System must store data effectively and must anticipate the time remaining until all available storage is filled up. | To ensure that multiple users can use the system at the time | N/A |

## **2.4.3 MoSCoW Prioritization**

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Title** | **MoSCoW** | **Description** |
| F1 | Database connection | Must have |  |
| F2 | User registration | Must have |  |
| F3 | User login | Must have |  |
| F4 | Logout | Must have |  |
| F5 | Payment | Must have |  |
| F6 | Authentication | Must have |  |
| F7 | Add buses | Must have |  |
| F8 | Remove buses | Must have |  |
| F9 | Update bus details | Must have |  |
| F10 | Add routes | Must have |  |
| F11 | Remove routes | Must have |  |
| F12 | Update route details | Must have |  |
| F13 | Viewing bus details | Must have |  |
| F14 | Searching routes | Must have |  |
| F15 | Seat viewing | Must have |  |
| F16 | Seat booking | Must have |  |
| F17 | Cancel Reservation | Must have |  |
| N1 | Performance | Should have |  |
| N2 | Scalability | Could have |  |
| N3 | Recoverability | Must have |  |
| N4 | Availability | Should have |  |
| N5 | Reliability | Should have |  |
| N6 | Maintainability | Should have |  |
| N7 | Security | Must have |  |
| N8 | Usability | Should have |  |
| N9 | Interoperability | Could have |  |
| N10 | Serviceability | Would have |  |
| N11 | Manageability | Would have |  |
| N12 | Legal | Must have |  |
| N13 | Capacity | Should have |  |

## **2.4.4 SRS(System Requirements Specification)**

# **2.5 Use-case diagram**

# **2.6 NLA and Initial class diagram**