American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science &Technology (FST)

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<Airlines Ticket Reservation System>

Software Requirement Engineering

Sec: **B**

Project submitted

By

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1. PROBLEM DOMAIN

1.1 Background to the Problem

In 2019, about 2,000 flights were delayed and 238 were canceled recently due to airline reservation system issues. Major American airlines, as well as all travelers, were affected by a technical problem with Sabre Corporation. American Airlines, Alaska Airlines, JetBlue, and WestJet were the most affected by the IT outage. The goal and aim of this project are to create an "Air Ticket Reservation System" that will allow customers to search for and book flights for both regular and emergency trips, such as air paramedical assistance, business transactions, and so on. This idea will improve profits while reducing additional costs and unneeded effort on the part of passengers and flying operators. This project covers all of the information of all of the tasks completed throughout the Air Ticket Reservation System Project's software requirement elicitation process and contains all of the project's specifics.

The majority of air paramedics have to deal with a lot of stress as a result of aircraft delays or cancellations, as well as manual document screening, which poses a health risk. Most traders and merchants have suffered significant losses as a result of airline delays or cancellations. For airline reservation system failures, Sabre must compensate the carriers. They lost millions of dollars. In addition, travelers should be compensated for missed family occasions, lost connections, and missed business activities. Weddings, scheduled excursions, and cruises have all been missed by families. Meetings have been missed by business travelers. Many others suffered financial consequences as a result of information technology failure.

1.2 Solution to the Problem

The system will inquire about the current state of the travel. If the user has an emergency, the user can book two or more more aircrafts for the travel in case of flight cancellation or delay. If the user does not book two or more additional aircrafts, the user will be refunded in case of flight cancellation or awarded in case of delay. However, in the event of an emergency, the user will be charged an additional fee for the backup flight.

The new system only requires six skilled personnel to operate, and a total of ten staff per office is sufficient. As a result, we'll select six of the best individuals from the present system and train them.

Because our current system is entirely manual, we will require a one-time expenditure of BDT 4 lakhs to acquire seven PCs, five ticket printers, a laser printer, air conditioning, and networking. As a running expense, it necessitates 20 Lakhs PA.

With the previous information, our technique is theoretically possible, since the corporation saves BDT 25 Lakhs per annum after investing 24 Lakhs in a year.

The primary goal of this vision document is to outline the project's activities and plans for the Air Ticket Reservation System. This document aids us in gathering and analyzing the project's concepts, such as which activity or job must be completed within what time frame.

Short description: This project is a generalized Airline Ticketing application that allows consumers to search for the availability of different airline tickets. This project also includes features such as user registration, management staff or administrator modification of application details, customer details addition, deletion, or modification, and flight information.

Benefits:

1. This will be a user friendly software.
2. It will reduce the unnecessary hustle of the passengers.
3. It will reduce the cost of the flight agencies
4. Moreover this project will increase the profit margin.

Objective: The purpose of this project is to design and create software that will automate important airline processes such as offering capabilities for online air ticket reservations and other procedures through an effective and yet easy user interface for a typical passenger traveling by air.

Existing Software Solutions: There are several other software projects that are utilized for ticket booking systems, such as expedia, kayak, make-my-trip, and many more, however not all of them give backup flight priority for passengers who may require an emergency flight. The problem can be remedied if a backup flight option is offered at the same time or just half an hour later.

A person arrives to make a ticket reservation. Then he fills out the customer form with all of his information. The computer then double-checks the date and the time that the customer has reserved. It checks the flights based on the dates. If the flight is scheduled to take off that day. The system then validates the unique flight id. It double-checked its seat class. If the passenger wants to go in economy and have a window seat. The algorithm then checks to see whether any seats in economy class are available inside the window. If a seat is unoccupied, the system has reserved it. After that, a ticket is created. The reservation has been confirmed. If the criterion is not met, the following seat is checked and justified. If it is not also empty then it checks next by next. If there is no seat then the system takes a ticket which is not confirmed. Then it gives a waiting list.

2. SOLUTION DESCRIPTION

2.1 System Features

System Functional Requirements:

1] Flight Reservation System: For a certain departure date, the system allows the airline passenger to search for flights available between the two travel cities, namely the "Departure city" and "Arrival city." The system displays a list of available flights together with specific flight information, allowing customers to select a trip that best suits their needs. If seats are available on a certain aircraft, the system will allow the customer to purchase a seat of his or her choosing; otherwise, the user will be directed to another flight. He may also cancel the existing bookings with ease.

2] Flight Status System: Our system allows registered users to monitor the status of their flights if they are delayed due to severe weather or other factors. It automatically alerts approved travelers who have tickets booked by sending messages.

3] User Accounts System: Creating and maintaining an online account with the system to view flight status and changes. A user can access his account by entering his approved username and password, or a new user can register for the system and become an authorized user.

4] Web Check-In: Passengers may acquire their boarding card and go straight to the baggage drop-off desk by using web check-in. This will surely save their time.

Quality attributes:

Usability: The system should be able to run on a variety of devices, including Windows, Android, Mac OS X, Unix, Linux, and many more.

Security: For transactions, a reliable, safe, and secure banking medium is required.

Robustness: When designing a system, consider recovery scenarios that allow you to restore a state that is no more than one business day old.

2.2 UML Diagrams

In this stage, A use case diagram has been drawn so that the working procedure of the system can be understood easily from this diagram in the initial stage.

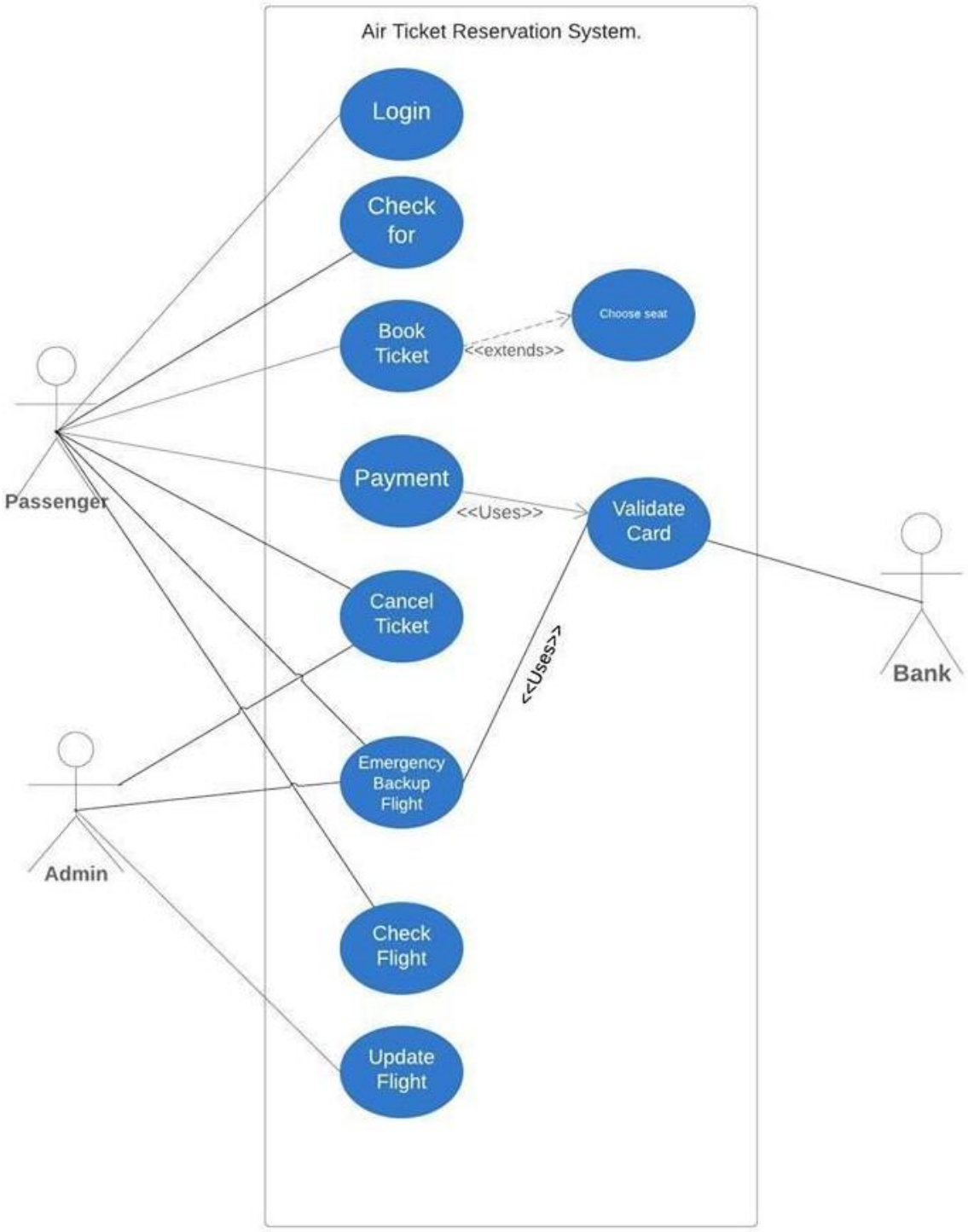


Figure 2.2.1 : Use case Diagram

E-R Diagram:

In this phase initially an E-R diagram of the processes had been designed , in order to

identify various entities and relationship set ,entity set ,attributers, link attributes The Diagram of this process as under.

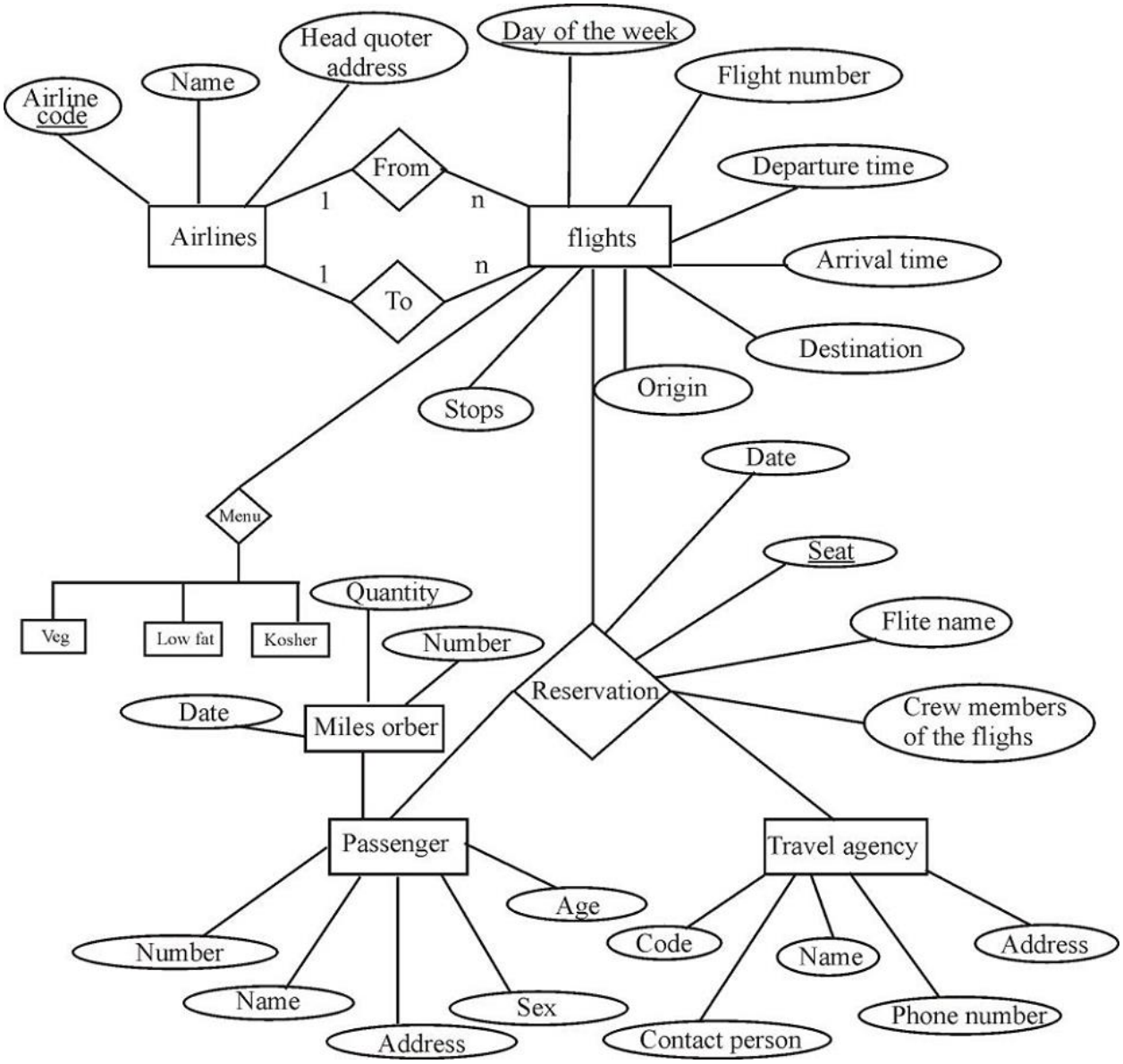


Figure 2.2.2: E-R Diagram

3. Social Impact

The software system for this initiative will open up new possibilities, but it will also provide a number of problems for air reservation businesses to overcome. These issues are unique to each company, but they must be evaluated in the context of the market's global ecosystem and its connections to other businesses. The project's goal is to:

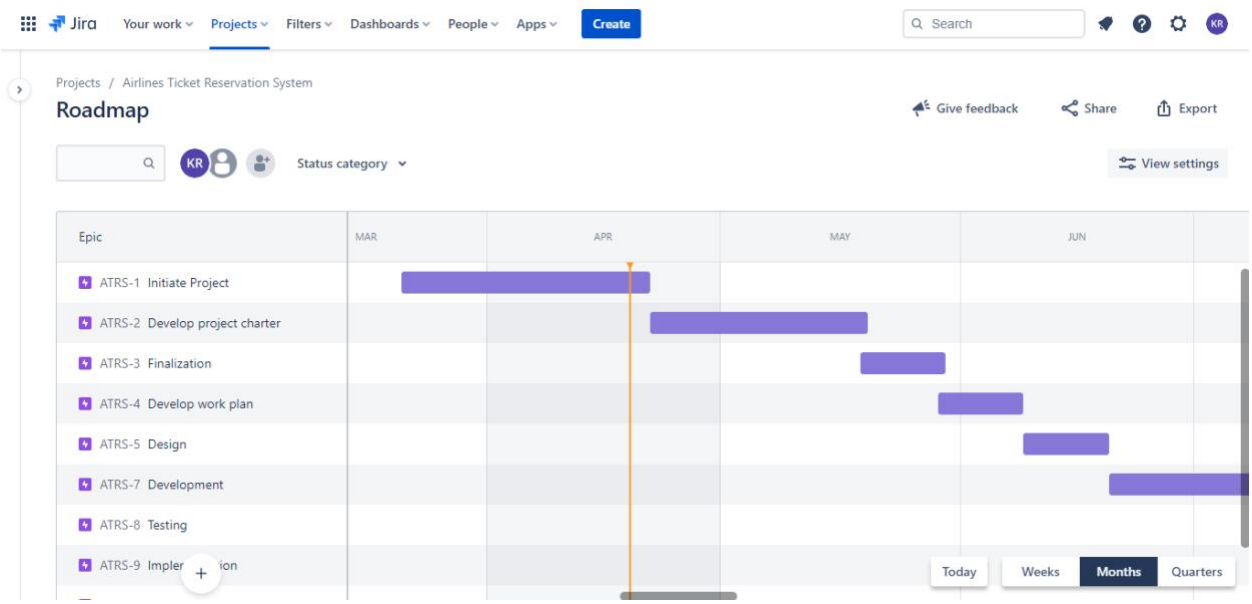
i)identify the companies' and their services' potential current and future economic growth impact on the social economy.

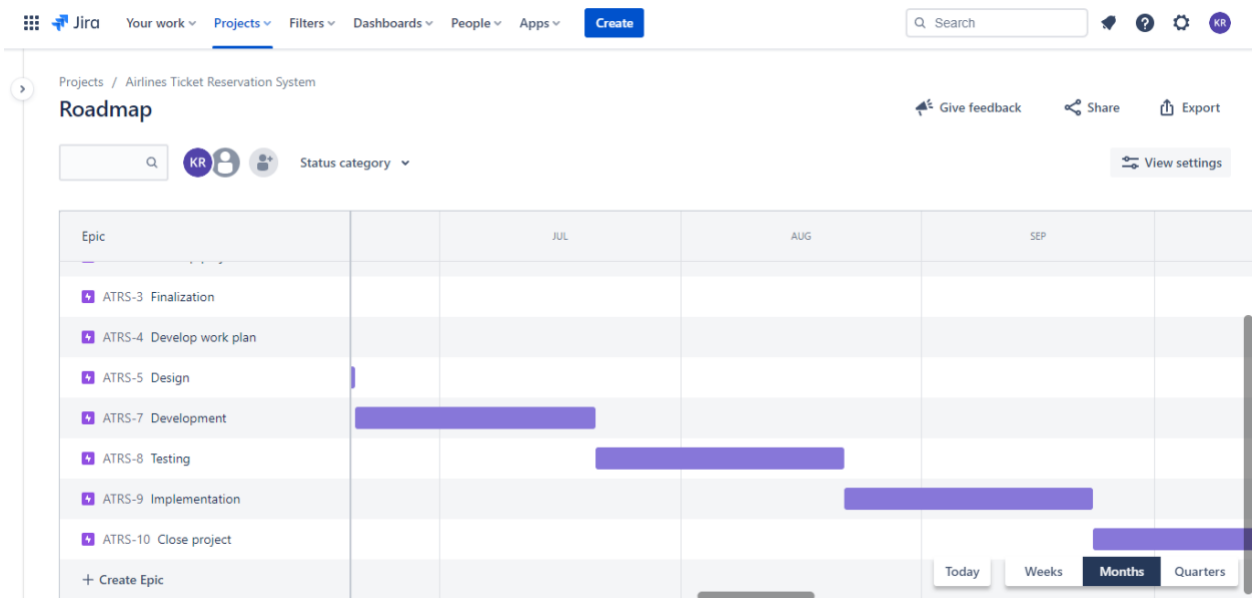
ii) identify the elements that determine its growth and competitiveness.

iii) assess the future market impact and expected market transformation due to emerging data-driven technologies.

iv) derive policy recommendations to remove barriers and foster the industry's development.

4. Project Schedule

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ATRS-9 Implementation
ATRS-10 Close project
Create Epic
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Months
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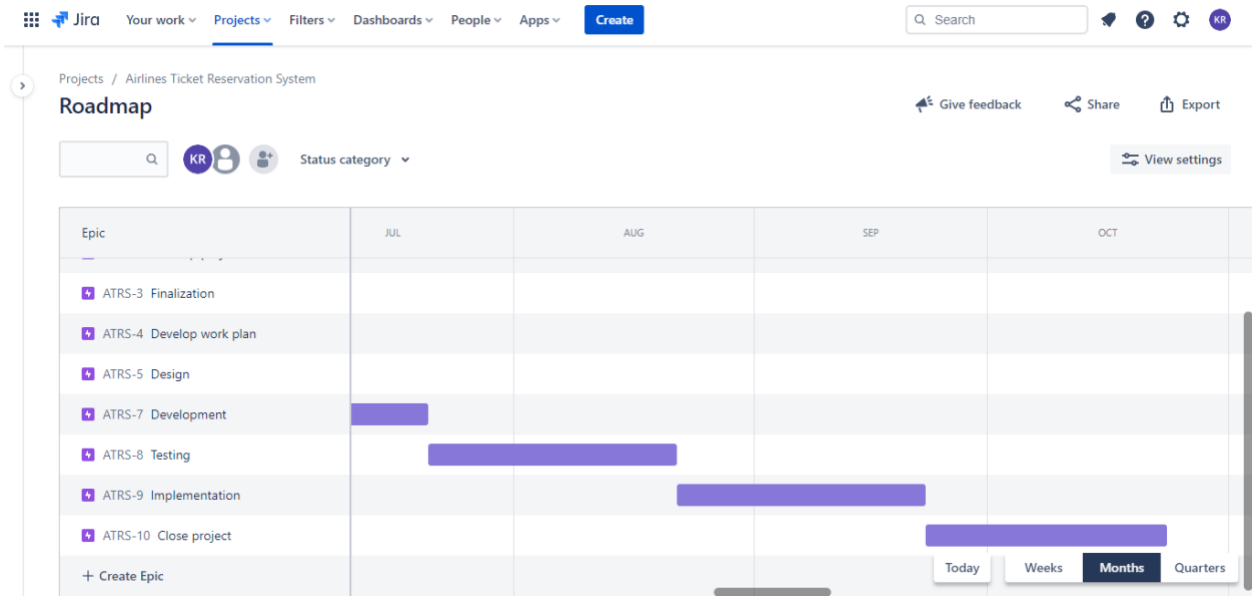
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5. Development Plan

List of Task (Work Breakdown Structure)

Initiate Project

1. **Develop Project Chart**
    - **i.** Define Scope
    - **ii.** Define Requirements
    - **iii.** Identify High-Level Roles
    - **iv.** Develop High-Level Budget
    - **v.** Identify High-Level Control Strategies
2. **Finalize Charter and Gain**
    - i. Consolidate and publish project charter
    - ii. Hold review meeting
    - iii. Revise project charter
    - iv. Gain approvals from government
3. **Plan Project**
    - i. Develop work plan
    - ii. Develop project staffing plan
    - iii. Develop project schedule
    - iv. Develop project budget
4. **Develop Project Control Plan**
    - i. Develop communication plan
    - ii. Develop quality management plan
5. **Design**
    - **i.** Define Stages and activities
    - **ii.** Design content Formats
    - **iii.** Object design Review
6. **Build**
    - **i.** Write Code
    - **ii.** Project Review with Airline Agencies
7. **Testing**
    - **i.** Unit Testing
    - **ii.** Test of Usability
8. **Implementation**
    - **i.** Move tool to production environment
    - **ii.** Announce Tool Arability
9. **Close Project**

6. Change Management Plan

As change management is one of the most difficult tasks, a full time Business Analyst will be assigned for this task. As the SRS document is the baseline, the versions will be changed after change impact analysis. The changes will be approved by the Change Control Board (CCB) who will provide the Change control policy (CCP). This board will consist of members from every stakeholders' group. As a result, whenever there comes a change, the board will analyze and decide that either the requirement is going to the next iteration or the requirement will not be done.

7. Marketing Plan

- Social Media: Simply by mentioning a product on Twitter or Instagram, a social influencer may instantly convert thousands of their followers into prospective consumers. Smart airlines pay or enable social influencers to travel for free because they know it will bring in a whole new set of consumers. Customer satisfaction and value for money are important factors. The profit you make is directly proportional to the value you provide to your consumer. As a result, an airline may use these social media platforms to start providing actual value to its customers. You might be wondering, "What are these ideals in everyday life?" In reality, an airline may generate material on a topic such as "what should you keep in mind on your first flight?" For people who are flying for the first time, an essay published on the subject is really useful. People will almost certainly purchase a ticket via you if they read your material. As a result, sell less and provide greater value. To raise brand recognition, an airline can develop videos and broadcast them on YouTube. Any airline's brand value will increase by broadcasting such movies and useful instructions regarding air travel. Also Most of the social media are running paid Ad campaigns to promote brands. This can be a great opportunity for this project.

- Loyalty Program: We can encourage repeat consumers to book extra flights with our company by establishing a loyalty program. For identical itineraries, most airlines will charge the same rate. We may obtain an advantage over the competition by allowing customers to earn points and become eligible for rewards. Seat upgrades, complimentary flights, airport lounge tickets, and cheap parking spots are all examples of perks. If we get inventive, you'll discover that loyalty program members will want to book only with you to get the most out of their advantages.

- Creative Advertisement: When it comes to advertising, thinking outside the box can help us integrate ourselves into our clients' daily life. The most effective airline marketing efforts include classic and non-traditional methods, so in addition to web and print advertising, make our presence felt in the community. Air France dispatched vehicles to New York City to hand out complimentary food samples to residents in various areas. At athletic events and food festivals, Delta has built Sky360 Lounges. Any method we can get your name out there and have people remember you is beneficial to your business.

- Backup Flight Program: If passengers have an emergency, the agency can provide a backup flight option at no additional cost to them; however, if the backup flight is not used, customers can receive a full refund. If a flight is canceled or delayed, customers will be given rewards or a refund in the event of a flight cancellation.

- Air paramedical care: air paramedics will be provided with additional features and services.

8. Cost and Profit Analysis

Cost Profit Analysis	2022	2023	2024	2025	Total
Development cost					
Website design	450000				450000
Training		5000	5000	5000	15000
Software license	20000				20000
Data reservation cost	7000				7000
Total Development					492000
Save Cost					
Decrease computers		50000	65000	68500	183500
Less amount of labor		36000	38000	45000	119000
Increased Conference Reservation		110000	125000	132000	367000
Increased Non-Conference Reservation		120000	130000	135000	385000
Total Save Cost					1054500

According to the cost profit analysis estimates supplied below, the system has a roughly 69 percent profitable return on investment over the following three years, and the profit closes to the development cost in the first year. The true profit could be calculated in the second year.

Final Profit = (Total Save Cost – Total Development Cost) = (1054500 - 492000) = 562500

9. References:

1. https://www.travelersunited.org/airline-reservation-system-failures/
2. https://www.processimpact.com/
3. https://raiyan.atlassian.net/jira/software/projects/ATRS/boards/2