American International University-Bangladesh (AIUB)

Faculty of Science and Technology (FST)
Department of Computer Science (CS)

SDPM Group Project, Summer 2022

Project Title "Airlines Ticket Reservation System"
Section A

Submitted by

Name	ID
Ahsanul Haque	18-37779-2
Mahabubul Hasan Hridoy	19-39279-1
Nowrin Islam	19-39339-1
Khandaker Raiyan Rahman	20-43516-1

Table of Contents

1.0 Introduction

This document covers all the information about our project management for the development of the Airlines Ticket Reservation System.

This is the project management plan for our project which contains all the details about how we are going to manage and implement the project. The target audiences of this project document are the project manager, the project sponsor, the project owner, the project stakeholders, the client (some parts of the project plan might be confidential information, we should check with our management team as to what parts of the project plan, we should communicate to the client) and project team. The intention of this document is to better manage the project, efficiently use the available resources and successfully complete the project within the deadline.

2.0 Project Title

Airlines Ticket Reservation System

3.0 Objectives

3.1 Overall 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.

3.2 Specific Goals

1. This software system to be built will be a simple user interface design that will be human centric.

2. It will reduce the unnecessary hassle of the passengers such as flight delays, manual processing delays, payment gateway issues.

3. It will enhance the efficiency, reduce the service time and minimize the resource utilization of the flight agencies.

4. Moreover this project will increase the profit margin.

4.0 Justification

In 2019, about 2,000 flights were delayed and 238 were canceled recently due to airline ticket 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 infrastructure 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, also provide features such as air paramedical assistance, easy business transactions, and so on. These ideas will increase profit while reducing additional cost and unneeded effort on the part of passengers and flying operators.

Most air paramedics usually deal with a lot of stress because of aircraft delays or cancellations, as well as manual document screening, which increases the total working hours for the air paramedics crew that may increase the health risk of the air paramedics' crew. Also due to manual processing of so many passengers every day the air paramedic crew might miss a tiny detail about the ill passenger that might pose a health risk for other passengers. By automating the process of checking health

related issues by simply introducing health card to each of the passengers just alike passport we can both reduce the processing delays as well as reduce the percentage of error occurred due to manual processing. Most traders and merchants have suffered significant losses because 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, 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 because of information technology failure. Our goal is to eradicate all these problems, increase profitability of the airlines company also to reduce the hassle of the passengers.

5.0 Systems Overview

Use Case diagram for Airlines Ticket Reservation System is at Next Page

5.0 Systems Overview

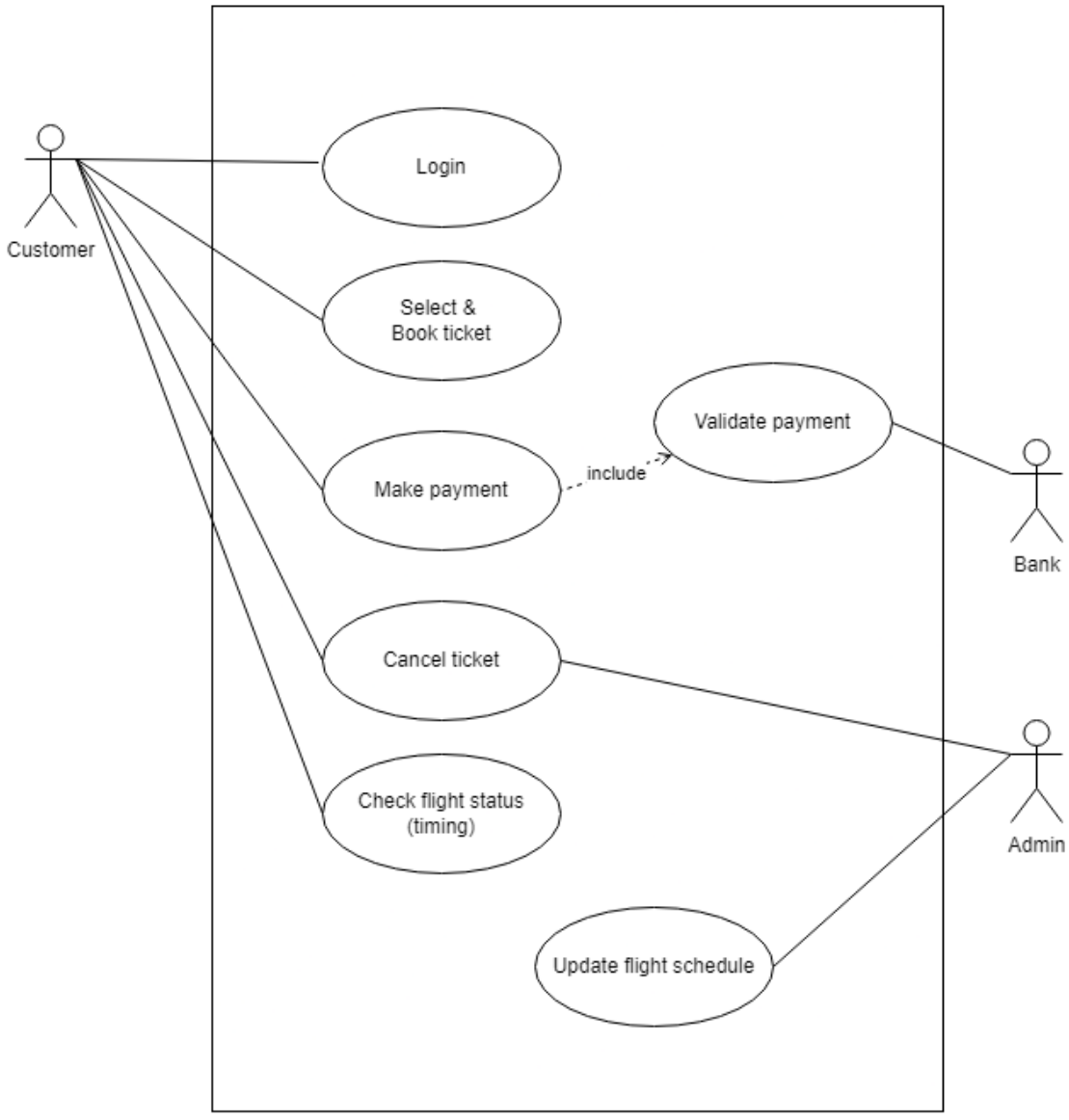


Figure – Use Case diagram for Airlines Ticket Reservation System

6.0 Stakeholders Analysis

A stakeholder is anyone who is affected positively or negatively by certain factors from a project. These factors include:

- Cost
- Time
- Scope
- Resources
- Quality
- Risk

We will be following this definition when answering this question. In this context ABC is an Airlines Management Software System. We will identify the overall stakeholders present in it, both the internal stakeholders and external stakeholders. They are:

6.1 Internal Stakeholders

1. **Software Division** - The software developers, business analyst, tester, and project managers are one of the main internal stakeholders of the software system. Their job depends directly on the success of the company. If the company were to suffer from losses, it would directly impact them in terms of their salaries and livelihood.
2. **Operational Management** - This group is responsible for helping the mid-level management to carry out the daily operations of the company properly. Handling the employees of the organization directly. Their responsibilities include checking if the activities are being held on time and ensuring that the different divisions are operational. This makes them stakeholders, as they will also be impacted by the performance of the company.

3. **HR and Admin** - This group is responsible for hiring new employees and cutting down on unnecessary costs and effectively utilizing the resources to contribute towards the success and increase profit for the company. They are also directly being impacted by the success of the company, as they are investing effort and time into ensuring that the organization is performing at its best.

4. **Board of Directors** – They observe and gather data about the current state of the company and develop strategic decisions and plans to make the organization more profitable. Board of Directors decides the main changes that can happen at ABC Airlines Ticket Reservation System, so they are very important stakeholders. Their roles in decision-making will be impacted greatly by the success or failure of the organization.

5. **Owners** - This is perhaps the most obvious stakeholder; the owners are internally and directly impacted by the success or failure of the organization. Their livelihoods are critically impacted by the company's performance.

6. **IT Department** - This stakeholder is responsible for ensuring the network operation, monitoring the server weather they are functioning properly or not. If any employee faces any hardware related issues or any issues on their computer, they are responsible to resolve those issues. As they are employees of the company, they are also stakeholders of the organization.

7. **General Staff** - The general staff are also employees of the company, they are responsible for updating the daily schedule, keeping track of flight delays, preparing the sales reports and as their livelihoods and salaries depend on the success of the company, they are also stakeholders.

8. **Maintenance Workers** - They are employees who are taking care of the infrastructure. They are full time workers who are responsible for maintaining, cleaning the institution. Fixing things, maintaining the equipment that are needed for daily operation of the organization. Therefore, they are also internal stakeholders, as the organization's performance is directly impacting them.

6.2 External Stakeholders

External stakeholders are those who do not directly work for company but are affected somehow by the actions and outcomes of the business. In our project, in Airlines Management Software System external stakeholders are:

1. **Passenger:** They are the most important external stakeholder of the software system. They take service through using the software. They pay for the service that keeps the business running. That is why all requirements are built keeping the customers in mind and designed according to their comfort and convenience.

2. **Supplier:** Suppliers are external stakeholders. Suppliers get profit because the organization tend to keep long relationships with the same suppliers to get the products at a discounted rate**.**

3. **Bank:** Bank is a major external stakeholder. The partnership between the Airline Company and bank is a crucial thing. Banks help the organization in many ways by giving loans with low interest to expand the business further. The Airline Company also keeps their money in banks which help banks to invest in other things. Moreover, for each digital transaction banks get a small cut for their online digital payment gateways.

4. **Government:** Government gets tax for each ticket transaction. They also get a cut for the import export activities.

5. **Internet Service Provider:** The Airlines Company need internet access to function properly. For that reason, the organization buys internet connection from good internet service providers who provide excellent service uptime and keeps a long business relationship with the same ISP if no problematic issue occurs. Internet service providers are external stakeholders.

7.0 Feasibility Study

7.1 Technical Feasibility

The necessary number of software developers are available to build the software. The servers are also capable of providing the service without constant supervision of any onsite software engineer. It will notify the software engineers through cloud monitoring tools if any error occurs. Moreover, today there are excellent Internet service providers that offer over 99% service up-time that will consistently provide stable, quality service for the customers. We also have the required software tools and the hardware to develop the whole software system.

HW Requirement (Min)-

• Memory: 2 GB

• GPU: INTEL HD Graphics 520

• CPU: Intel Pentium Gold G6400

SW Requirement-

• OS: Windows 7/10/11

• Database software: XAMPP

• Language: PHP/HTML/CSS/JavaScript

It can be concluded that the project is feasible in terms of technical assessment.

7.2 Financial Feasibility

This project will reduce the hassle of manual processing and reduce the delay also. So, there are a huge number of people who are willing to pay that extra service charge to eradicate those hassles. That increases the chance of earning consistent profit through this business investment.

Development cost	BDT 6400000
Tester	BDT 600000
Project Manager	BDT 1120000
Project Co-Ordinator	BDT 800000
Consultant	BDT 1600000
Office space	BDT 800000
Utilities (water, internet, electricity, Miscellaneous)	BDT 160000
10% overhead cost for safety	BDT 1148000
Total Cost	BDT 12,628,000

Proposed budget to the client for the project is BDT 17,000,000

Total cost of the project with profit included: BDT 16, 500, 000

As the project costs are well within the reach to achieve a significant amount of profit from this project so it can be stated that the project is financially feasible.

Feasibility Study: Comparing with the bank's interest rate

Since the local corporate banks offer 7% interest rate

Then the profit from BDT 12,628,000 investment will be

12,628,000*7% = BDT 883960 (yearly profit)

Then the profit for 16 months (project duration) would be

= (883960/12) *16 = BDT 1178614 (around 11 lacs)

On the contrary the estimated profit from the project is 30% of the entire budget of the project

Which is = 12,628,000*30% = BDT 3788400

In the case we undergo with the decision of implementing the project, the profit margin is significantly higher than earning profit from bank interest. The metrics show that the profit from building the project is almost 4 times than the profit gained from bank interest. So, it can be stated that the project is financially feasible with the proposed budget of BDT 17,000,000.

8.0 System Components

The system components are identified below using the Work Breakdown Structure (WBS)

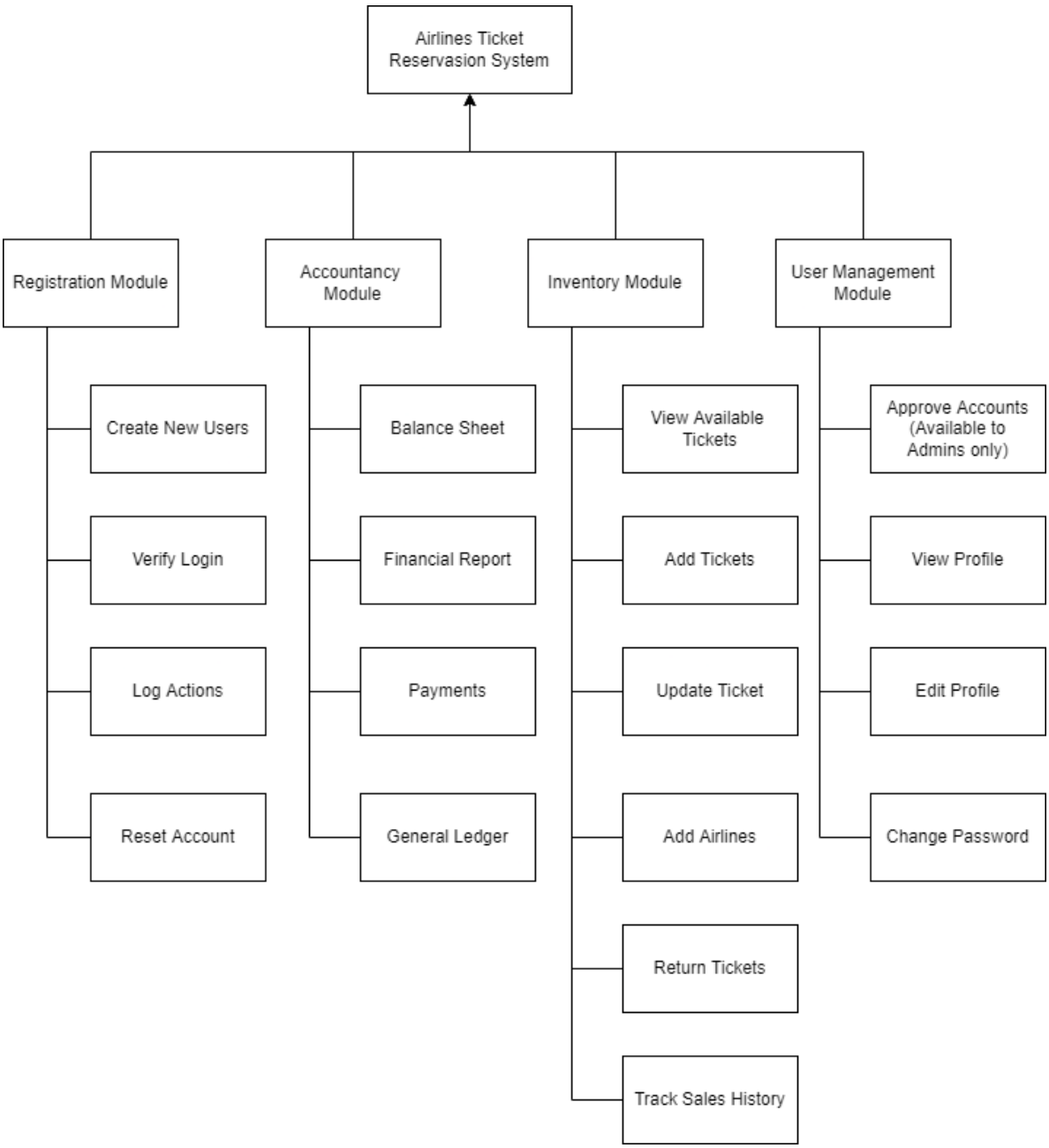
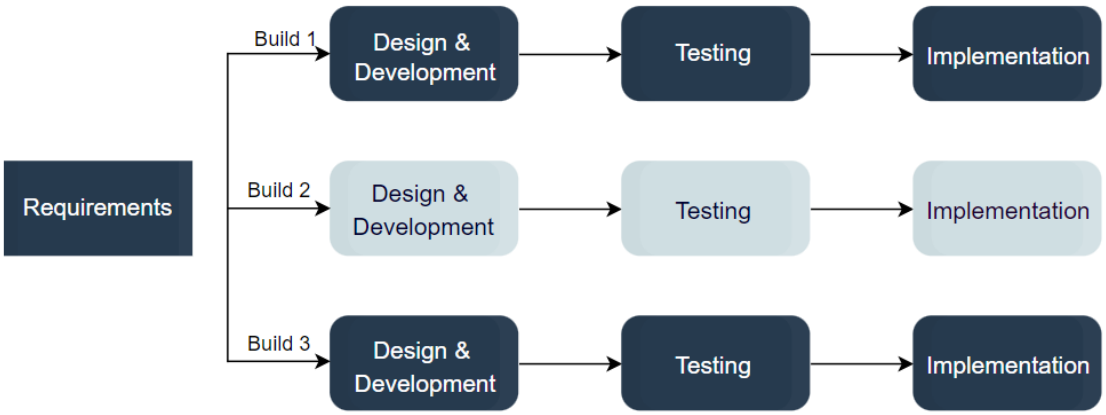


Figure – System components

9.0 Process Model

The iterative development model was selected for the development of this project. This was done for several reasons. The iterative development model develops a system through building small portions of all the features. This helps to meet initial scope quickly and release it for feedback. In the iterative model, you start off by implementing a small set of the software requirements. These are then enhanced iteratively in the evolving versions until the system is completed. This process model starts with part of the software, which is then implemented and reviewed to identify further requirements.



Advantages of iterative development process model

1. See the results at the early stages of development
2. Get early feedback from the customers
3. Easy to identify and fix any functional or design flaws
4. Manage risk and change requirements
5. Easier to handle large complex projects
6. Easily break down large software into small modules that are easier to build and manage

Moreover, after a group discussion with all members present it was concluded that due to getting early valuable feedback from the customers and being able to handle large complex projects easily during the development process, the iterative software development model would be best suited for “Airline Ticket Reservation System”.

10.0 Efforts Estimation

COCOMO (Constructive Cost Model) is used to estimate the effort for our project

Cost Estimation

If we consider that our project is organic:

Then,
Coefficient<Effort factor>= 2•4

Let's
consider SLOC (Source line of coding) = 40000

For organic project the value of P (Project complexity) = 1.05

The value of T (SLOC-dependent coefficient) = 0.38

Effort = PM = Coefficient *(SLOC/1000) ^P
PM (Persons-months needed for project) = 2.4 (40000/1000) ^1.05= 115.44

DM = (Duration time in months for project)
= 2.5x (115.44) ^0.38
= 15.19

Required Number of people = PM/DM = 115.44/15.19= 7.6 ~ 8

11.0 Network Activity Diagram

The activity diagram identifying different activities for scheduling the project is given below.

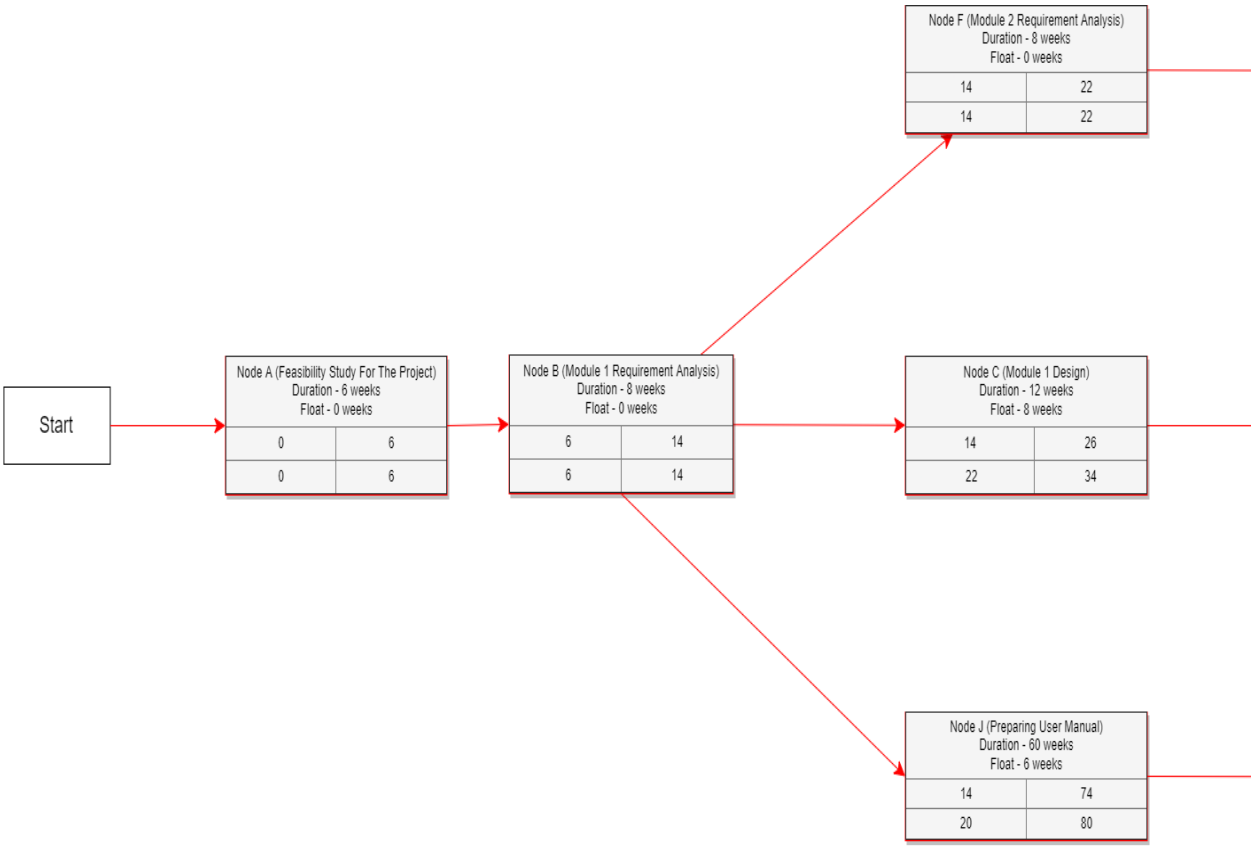


Figure - Network Activity Diagram (Part-1)

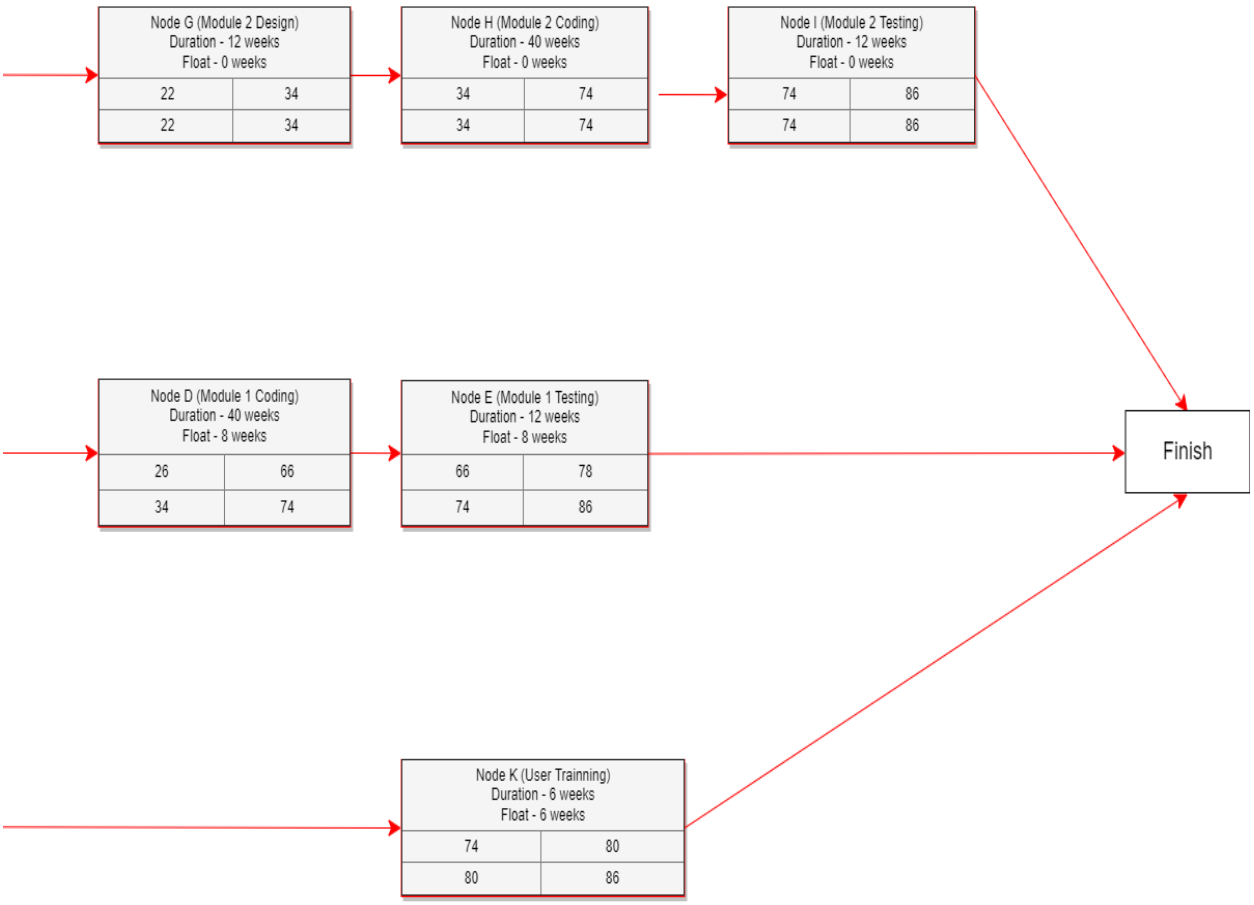


Figure - Network Activity Diagram (Part-2)

12.0 Risk Analysis

The possible risk for the proposed project is given in the following risk table. The probability is given between 0% to 100% whereas 100 percent is the highest chance of occurrence. The impact value is ranged between 0 to 10 where the value 10 indicates that it would be catastrophic and 0 indicating negligible impact on the project.

	Risks	**Probability**	**Impact**	**RMMM**
1)	System failure	10%	9	Make sure the units or components pass the required test cases before integrating the system
2)	Late delivery	80%	7	Make sure the project progress is on track, other take immediate action.
3)	Technology will not meet expectations	5%	2	Check whether the technologies are acquirable
4)	End users resist system	10%	5	The system passes the acceptance test, try to come to an understanding with the

				client
5)	Changes in requirements	60%	5	Check if the changed Requirements are feasible, try to make the requirement change before starting the development phase. Deliver the product in short increments time-boxes so that the user gets less time to finalize the requirements and change their mind.
6)	Poor Productivity	30%	3	Set achievable timeframes and a sustainable pace during project estimations to avoid burn-out of staff.
7)	Inadequate Risk Management	40%	7	Including risk in estimations. Find out the root cause and attempt for risk reduction procedures.
8)	Poor comments in code	20%	5	Train the programmers
9)	Unrealistic schedules and budgets	40%	7	Using historical data and using multiple models for estimation

13.0 Budget

Proposed project budget with profit included: BDT 16, 43, 000

Development cost	8*50000*16 =	BDT 6400000
Tester	2*50000*6 =	BDT 600000
Project Manager	1*70000*16 =	BDT 1120000
Project Co-Ordinator	1*50000*16 =	BDT 800000
Consultant	1*10000*16 =	BDT 1600000
Office space	16*50000 =	BDT 800000
Utilities (water, internet, electricity, Miscellaneous)	10000*16 =	BDT 160000
10% overhead cost for safety		BDT 1148000
Total Cost		BDT 12,628,000

14.0 Conclusion

This project will provide a new method in ticketing procedures. The ticket issuing and management of tickets will be done online. However, this initiative does not restrict the walk-in customers from purchasing tickets physically from the ticket counter. That is also provided for them. This approach also decreases the need for papers like in the previous ticketing approach.

The "Airline Ticket Reservation System" software package supports the online filing of executive reports and the online viewing of executive reports by the top management. Preparing the different reports required a laborious manual process but this approach will solve those issues and reduce the required time by a large amount. This package will be constructed and developed in a way that enables it to meet the user's needs and serve them more effectively and efficiently. The true problem has been observed carefully and resolved and planned accordingly.

The additional advantage of this system is that it provides options for future development so that future users' needs may also be met and updated with time.