SDPM Final Term Project

Project Title: AUTOMATED METRO RAIL TICKET MANAGEMENT SYSTEM

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Section: C

Group No: 07

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01.0 Introduction:

Metrorail is a new concept in Bangladesh that is going to be open to the public in a few years. Undoubtedly, Metrorail is going to be very popular in Bangladesh due to the congestion in the country and the mismanagement of the existing roads. Collecting Metrorail tickets can also be a challenge for such a large number of people. The following document contains information regarding a software development project for the Dhaka Metro Rail Ticket System. This project will develop an automated ticketing system for the purpose of selling tickets to customers. Customers can purchase their tickets with cash, mobile banking, or a credit card. In this way, each station will have adequate ticket booths at fixed distance intervals from which tickets can be collected. They may select their destination and purchase a ticket. Customers will view their train information, arrival time, ticket price, and other pertinent information regarding their journey while purchasing tickets.

02.0 Project Title:

AUTOMATED METRO RAIL TICKET MANAGEMENT SYSTEM

03.0 Objectives:

Metrorail is a new concept in Bangladesh that is going to be open to the public in a few years. Undoubtedly, Metrorail is going to be very popular in Bangladesh due to the congestion in the country and the mismanagement of the existing roads. Collecting Metrorail tickets can also be a challenge for such a large number of people. The following document contains information regarding a software development project for the Dhaka Metro Rail Ticket System. This project will develop an automated ticketing system for the purpose of selling tickets to customers. Customers can purchase their tickets with cash, mobile banking, or a credit card. In this way, each station will have adequate ticket booths at fixed distance intervals from which tickets can be collected. They may select their destination and purchase a ticket. Customers will view their train information, arrival time, ticket price, and other pertinent information regarding their journey while purchasing tickets. The main reason for this problem is that there are more passengers than counters and irregularities in the distribution system. Lack of manpower is also a major problem.

04.0 Justification:

Metrorail is undoubtedly a blessing in a densely populated country like Bangladesh. A report in the **Dhaka Tribune on May 20, 2018**, stated that **"Dhaka's traffic congestion has been reduced to 5 million working hours, costing BDT 37,000 crores".** Metrorail can reduce at a significant rate. Therefore, I am hopeful that the automated ticket system will play an important role.

- Through this project passengers will be able to buy their tickets safely.
- Bangladesh Railway will be able to reduce manpower through this project.

- Since the project relies entirely online, all information on ticket sales and unsold seats will be stored in the system. Unscrupulous officials will not get any chance to black market.
- When buying tickets manually, we notice an overflowing rush that lasts for 1 day or longer during various festivals. This system can be used to overcome this situation. People will be able to save their precious time.
- Passengers will be able to buy tickets from anywhere as there is a mobile application, website, and booth facility. There is also a facility to buy tickets directly at the booth with cash.
- Passengers have special privileges to cancel their tickets within the stipulated time in case of unforeseen circumstances.

05.0 Stakeholders analysis: In our system, there are two stakeholders. The first type of stakeholder is an internal stakeholder, while the second type of stakeholder is an external stakeholder.

Internal Stakeholders: employees, owners, and managers are examples of internal stakeholders. Internal stakeholders in our project include:

1. Employee: The primary internal stakeholder will be the employee. Employees have significant financial and time investments in the organization, and they play a key role in the organization's strategy, tactics, and operations.

2. Manager: Managers are internal stakeholders because company employees are invested in the company's performance in order to keep their jobs and be paid. Employees may have a health and safety focus depending on the nature of the business.

3. Developer: They have the technological know-how to advise executives on which features are feasible and how long they will take to implement.

4. Shareholders: They are linked to your company because they own stock. As a result, projects that affect stock prices directly affect them.

External stakeholders are people who do not work for a company but are impacted by its actions and outcomes in some way.

1. Suppliers: Suppliers provide a company with the raw materials or components it needs to make its products. A business may rely on a single supplier who produces a superior or rare good, in which case the supplier is given special consideration.

2. Banks and lenders: Lenders are external stakeholders because they have a financial stake in the project's success, as well as potential reputation, insider knowledge, and networking.

3. Government: In all businesses, the government is an external stakeholder. It is, in fact, one of the most important stakeholders because it collects taxes from these businesses in the form of corporate income tax and employee income tax.

4. Customers: Customers are the most significant external stakeholders. These are the people who will consume the company's final products or use its services. They thus determine whether a business succeeds or fails, despite not being involved in its day-to-day operations.

06.0 Feasibility study: In the first section of this project, we will discuss the solution. As the globe approaches the pinnacle of technical success, our country is doing its best to keep up with the rest of the world by digitizing its conventional processes, and people prefer to solve their problems online rather than offline. Our method is the most effective online-based solution to the following problem. Once this project is completed, everyone involved will benefit. To complete this project, you need to use online booking system. In today's world this automated method is being used to book tickets for various hotels, restaurants and even buses. So it is easy and normal to use and maintain. This can be done using a precision algorithm. Ordinary ticket counters will no longer be needed once it is used. As a result, the required manpower will not be required in this sector. Economically, it is possible to save a large amount here. As well as this the system will be able to prevent black market or system loss which will ensure economic security.

07.0 Systems component:

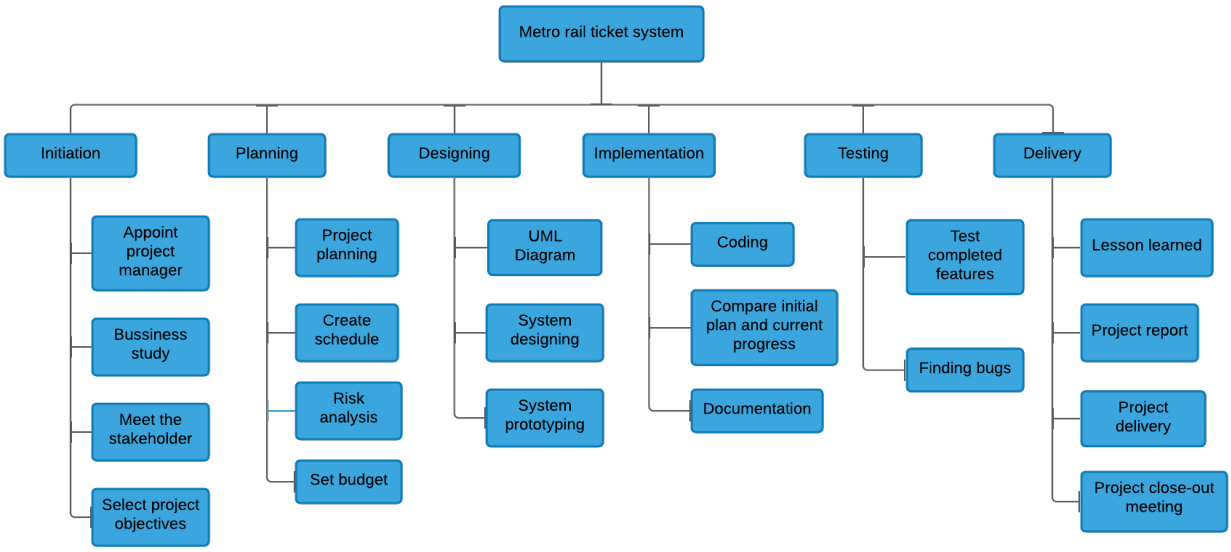


Figure1: Work Breakdown Structure of the project

08.0 Efforts estimation: An estimation of each task using COCOMO model is given below-

Organic -Software projects are said to be organic if the required team size is small enough, the problem is well-understood and has already been solved, and team members have just a minimal amount of prior knowledge about the issue at hand.

Since this is an organic system, the value of coefficient (c) is 2.4, project complexity (p) is 1.05, size (KLOC) is 9, T is 0.38

1. Effort = PM = c * (size) ^{P}

   = 2.4 *(9) $^{1.05}$

   = 24.10 person-month

2. Development Time = DM = 2.50 * (Effort) ^{T}

   = 2.50 * (24.10) $^{0.38}$

   = 8.37 Months

~ 36 Weeks

3. Required number of people = ST = Effort / DM

= 24.10 / 8.37

= 2.87 ~ 3 Persons

09. 0 Activity Diagram:

09.1 Precedence Network:

A→Hardware Selection

B→Software Design

C→Install Hardware

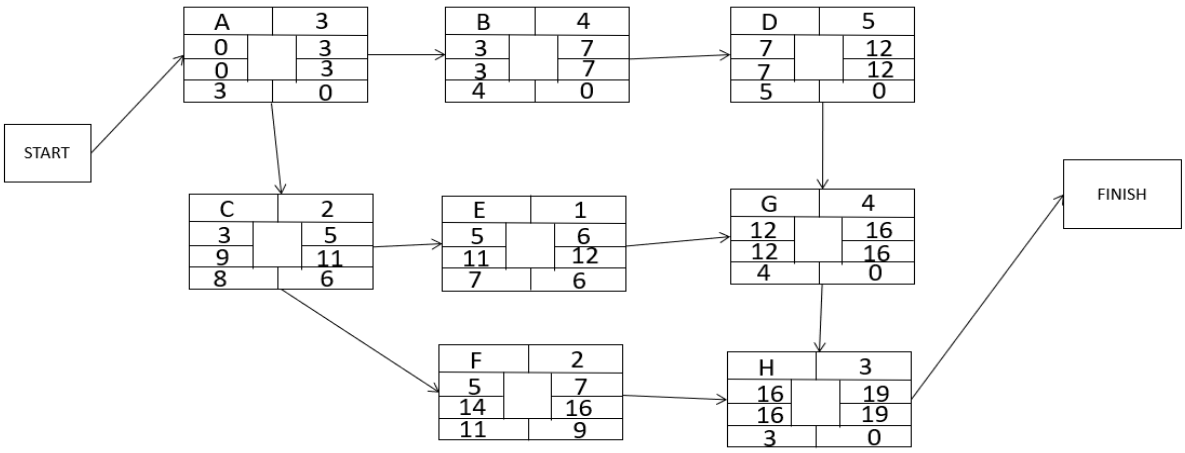
D→Code and Test Software

E→Check All Hardware

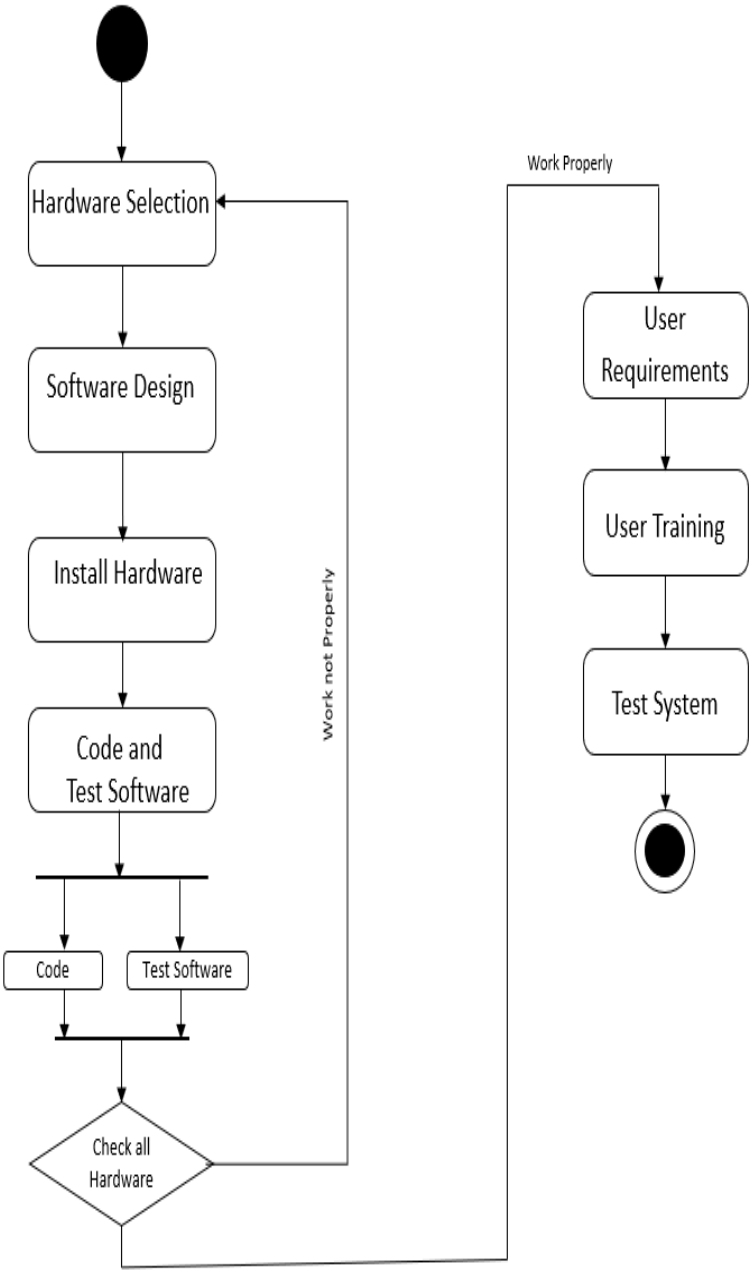
F→User Requirements

G→User Training

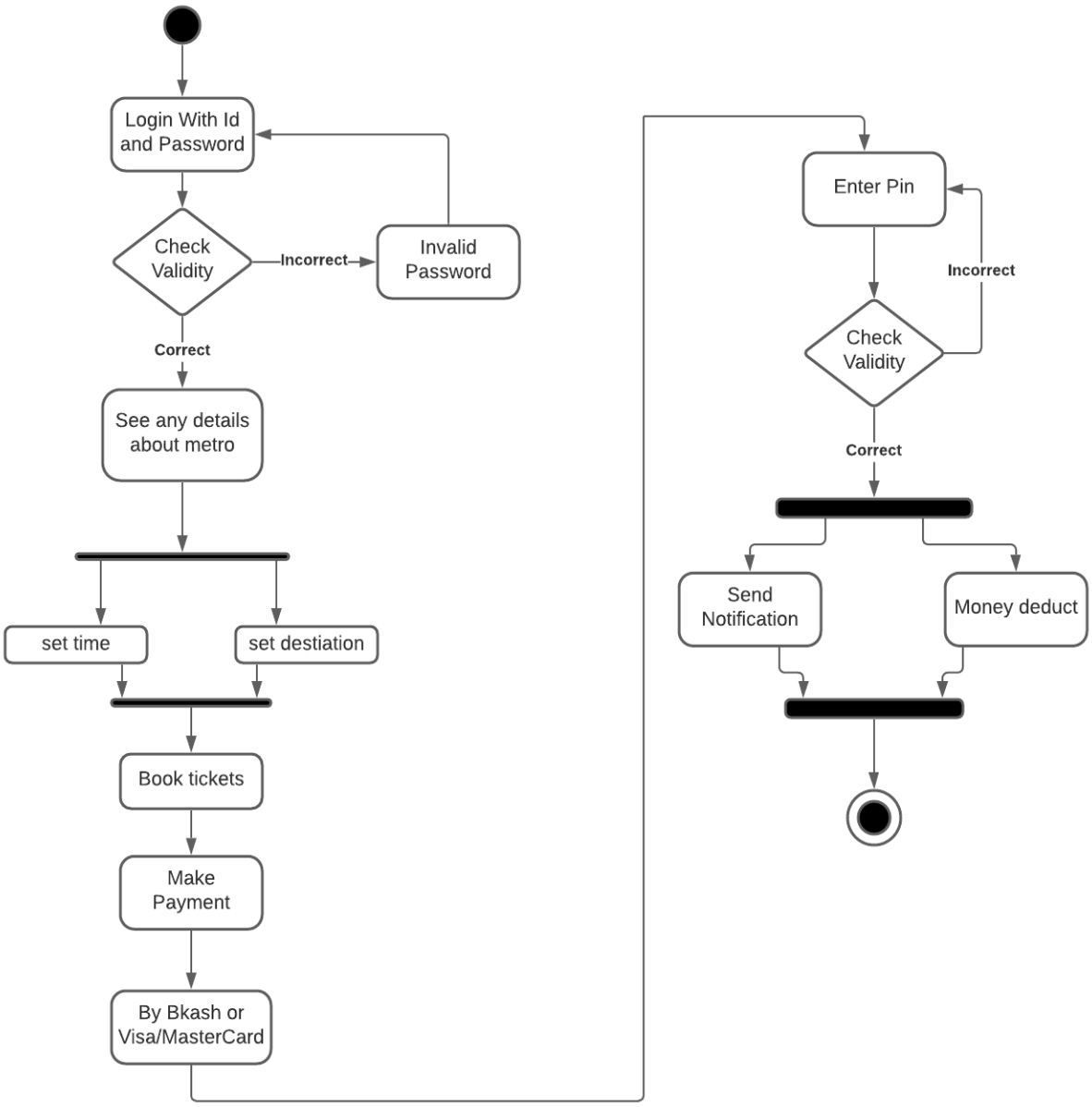
H→Test System



09.2 Activity Diagram **(**Schedule Activity**):**



09.3 Activity Diagram **(**Software Work Activity**):**



10.0 Risk Analysis: The risk for this system is very low. Without some resource problem there is no risk or problem present.

S/N	Risk Description	Probability	Impact	Mitigation Plan
1	Unrealistic time estimate	40%	High	Take multiple estimations.
2	Loss of work due to equipment failure/loss	30%	High	Weekly data backup to Hard drive.
3	Unavailability of API's	20%	Medium	Alternative API's will be checked for.
4	Developers needs to hardware or software requirements	5%	Medium	Select the best available hardware or software components.
5	Exceeding budget	15%	Medium	Some extra budget needs to be added.
6	Testing and debugging error	10%	Medium	Adopting qualitative testers.
7	Failure of server	10%	Low	Backup system database regularly.
8	Staff/Personnel shortfall	5%	Low	Take some extra members in the team.

11.0 Conclusion: As we all know; Metrorail will be a vital mode of transportation in Bangladesh nowadays. In our cities, public transportation is the only way for many people to commute from home to their workstations, and people must spend valuable time waiting in line to board a bus to get to work. Additionally, due to the narrow roads and rickshaws, traffic jams are inevitable, doubling the stress and wasting additional time. If we use this online system, we can easily save time, as the offline method requires us to wait an extended period of time in a ticket line to collect our ticket. The ticket black market is an open secret in this country. The system is expected to play a vital role in saving passengers time on rail travel, access to information, and valuable time. We believe that this system will play an effective role in ensuring the highest results with the great initiative of Metrorail.