Software Project Management

Lab 3

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Emily Lai 100825007
Alina Mathew 100853412
Natasha Naorem 100845321

Introduction

Our team is overseeing the project management of a railway tracking system, with the goal of providing users with real-time information regarding train schedules, including departure and arrival times, as well as any delays. This system enables users to efficiently manage their travel plans and ensures accurate information distribution across multiple stations. In this report, we use the software project management principles to estimate the project timeline, assess the scheduling of key tasks, and evaluate potential risks.

Estimated Efforts

The COCOMO model will be used to estimate the amount of effort that the railway tracking system requires. We can use the COCOMO formula:

$$E_i = a * (KLOC)^b$$

with a and b constants corresponding to the COCOMO constants for different project types.

Based on the nature of the railway tracking system, we can establish that it is an organic project. This is because the project environment is well-known and fairly stable, and there are past products that are similar to compare to, so the project should not require a lot of innovation.

The a and b constants for an organic project are 3.2 and 1.05, respectively.

We created this breakdown to make an assumption for the lines of code required:

Source	Lines of Code
Database Schema	500
UI (Application for station staff, customers)	3000
Interface APIs	1500
Sum	5000

We estimate the initial MVP (minimum viable product) to require about 5,000 lines of code (KLOC=5).

Therefore, we can calculate the time estimate for our initial MVP:

$$E_i = a * (KLOC)^b$$
$$= (3.2) * (5)^{1.05}$$
$$= 17.34 \text{ months}$$

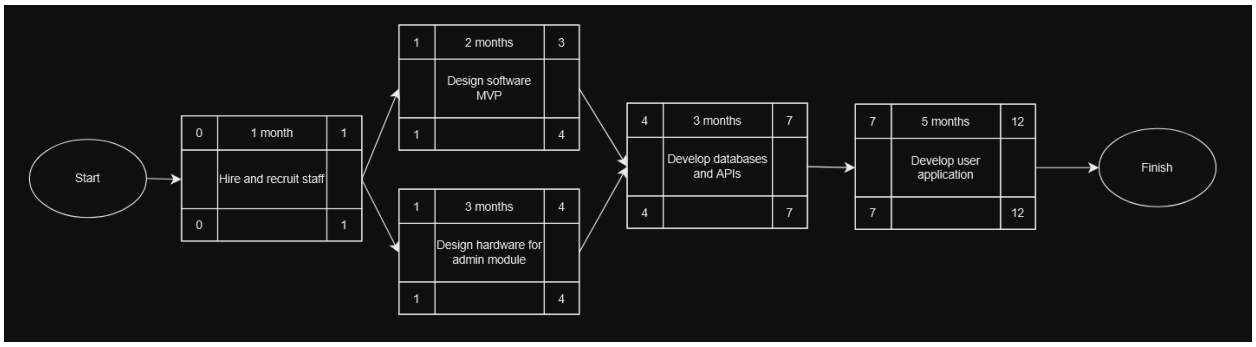
Thus, the COCOMO model produces an estimate of 17.34 months for this MVP.

Activity Diagram

In this task, we have created estimations for the earliest and latest starts and finishes for the numerical month for every stage of the project.

The following tasks were estimated:

Task	Estimated time	Depends on tasks
Hire/recruit staff	1 month	N/A
Design hardware for admin module	3 months	Hire/recruit staff
Design software MVP	2 months	Hire/recruit staff
Develop databases and APIs	3 months	Design hardware for admin module Design software MVP
Develop user application	5 months	Develop Databases and APIs



Risks

One critical risk that must be considered is the accuracy and reliability of the data collected and transmitted by the railway tracking system. It is very important to provide the users with accurate information on a timely basis. This can be risky as any errors could lead to misinforming passengers about train schedules, and could lead to passengers missing trains and severely disrupting their travel plans. This risk can be addressed by doing a very detailed validation process of the data and ensuring mechanisms are in place for error detection and correction.

Another important risk to consider is the safety and security of people involved. This applies to all people involved, including passengers and train station staff. If an unauthorized person gains access to the system, they could put people at risk. For instance, workers repairing one track may be startled by the warning that a train is to pass through the tunnel they are working on,

and rush to a safe area only to find that the train was not supposed to run on that day. Security measures should be implemented to prevent these kinds of risks to safety.

Another risk is the complexity of integrating different components. The railway tracking system can improve its accuracy by integrating different components such as GPS tracking systems, communication networks, and database management systems. However, each new system being integrated can lead to different errors, incompatibilities, or delays in the project implementation. To reduce this risk, the system should be thoroughly tested for integration of each component, and ensure that there are backup plans in place so that the system does not go down if there are technical issues or challenges that occur.

Conclusion

In this lab, the project efforts were estimated, an activity diagram was created, and the risks were assessed. The COCOMO model and activity diagram both created time estimations for the project. Finally, the risk assessment detailed potential risks that the development team would need to consider during the development process.