American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science &Technology (FST)

Summer 20 21

< Digital Treatment System >

Software Requirement Engineering

1. PROBLEM DOMAIN

Background to the Problem

- Health is wealth and it is the root of all happiness. But completely healthy person is rare in this world. In our daily life, it is common to get sick by many diseases. In that case everybody needs treatment more or less, but in Bangladesh treatment processes are too slow and difficult to get. From finding appropriate doctors, ambulance, pathology, diagnostic center and purchasing medicine in every sector, it is time consuming and has lot of limitations.
- **Root Cause of this Problem:**
  Our treatment sector is much backdated till now comparing with the other countries. We don't have websites in rural areas hospital and clinic, ambulance is rare to find in critical situation, shortage of blood donor and so many. Identifying these problems, we decided to develop a system, which will solve most of the limitations and speed up the whole process.

Solution to the Problem

- We are going to propose a software solution where we develop a web portal for Digital Treatment so that patient can find appropriate doctors and make appointment within a minute. Also, if doctors suggest pathological test, patient can search different diagnostic center to know the price and can make appointment, ambulance calling, ordering medicine, contacting with doctor virtually everything will be available in our system. It will help people a lot to budget as they will able to see the different prices of medicines and pathology centers and maintain their time table and also they do not need to waste their time to get a serial for doctor's appointment and wait for the long time.

- A Digital Treatment System where users can select doctor's appointment according to their needs and budget and destination. After the selection of the appointment appropriately they can choose their payment method, that they want to make payment in cash or though mobile banking or though credit card. When the users done with the payment method a button will be pop up named "Confirm Appointment". After clicking this button, they will get download option and there will be a digital receipt of their details or they can directly print their appointment information details. Also there will be other options to search the pathology, calling ambulance. Also users can order medicine through online by comparing the prices of the medicine of the different pharmacies.

- There is an software which is pretty similler as our system and that software name is Kotha App(https://kotha.app/). The software is on the basis of life style moreover it can be said that it is an lifestyle app. In this software there is a virtual hospital functionality where users can take medical service virtually. But our system is not just for virtual service, users can also take virtual and physical benefits by using our app.

2. SOLUTION DESCRIPTION

System Features

The software will have the following set of requirements:

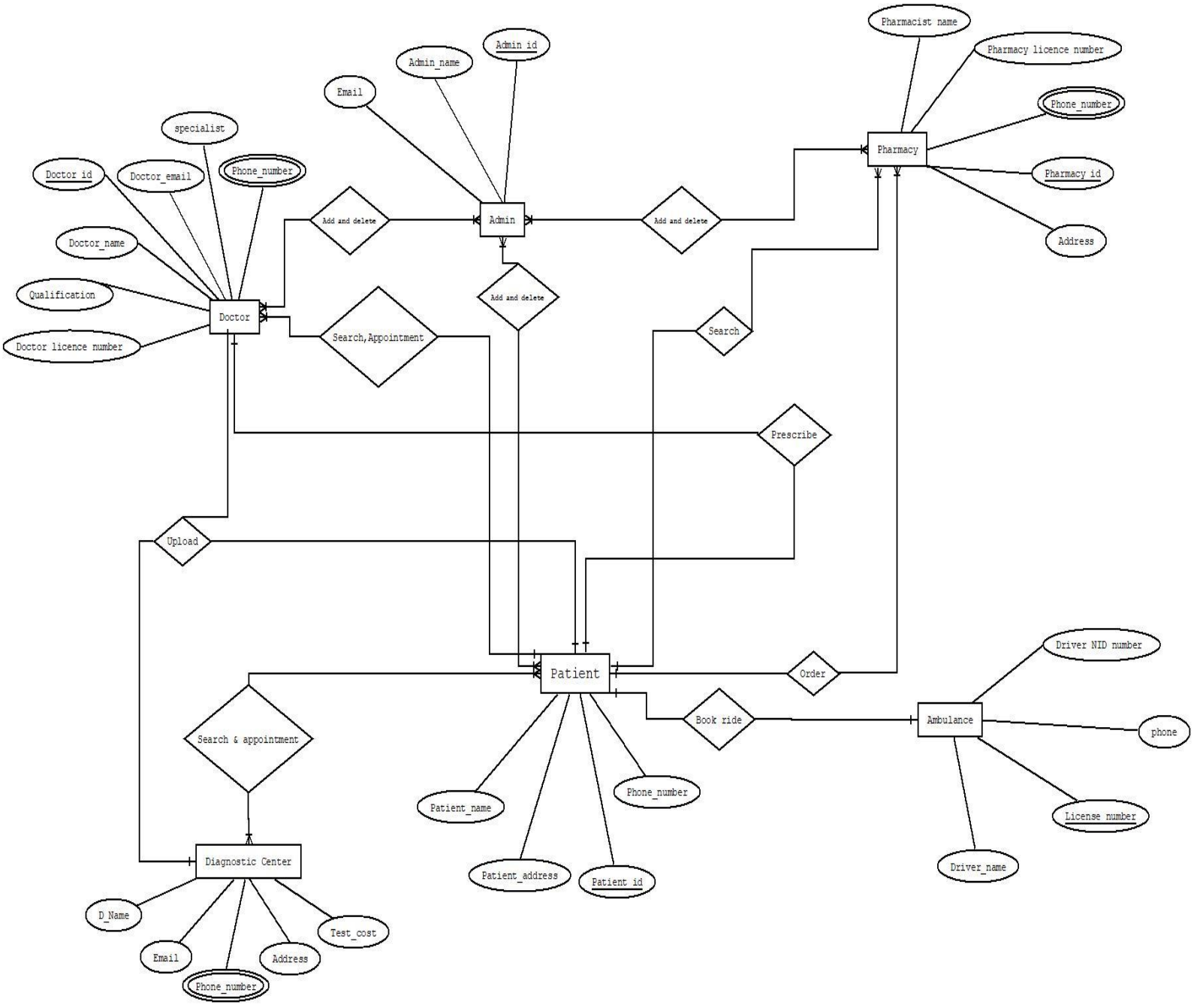
- The software will be a self-service portal.
- The software will support interface to touch screen monitors as well as keyboard interface.
- The software will display all the doctors availability time in different hospitals.
- The software will support search options by doctor's name, hospital name and by the type users want to book their appointment. Like: Orthopedics, Medicine and so on.
- A user can book multiple appointments at a time.
- The software system will support digital payment. Like: Mobile banking or cards.
- The software system will also support to choose the payment method in cash and at this situation hospital management will handle the payment.
- Before the confirmation of the appointment a confirm or cancel buttons will be pop up.
- After the confirmation, the software will provide a digital receipt with details of the appointment and the receipt will be downloaded by the users in pdf format.
- The software system will also support to search the ambulance, blood donors and pathology centers.
- The software will support the online medicine order system as well.
- The software has also an online web portal that can easily access and use the most functionality.
- The software will support information display via web browser.

The major functionalities of the system are as follows:

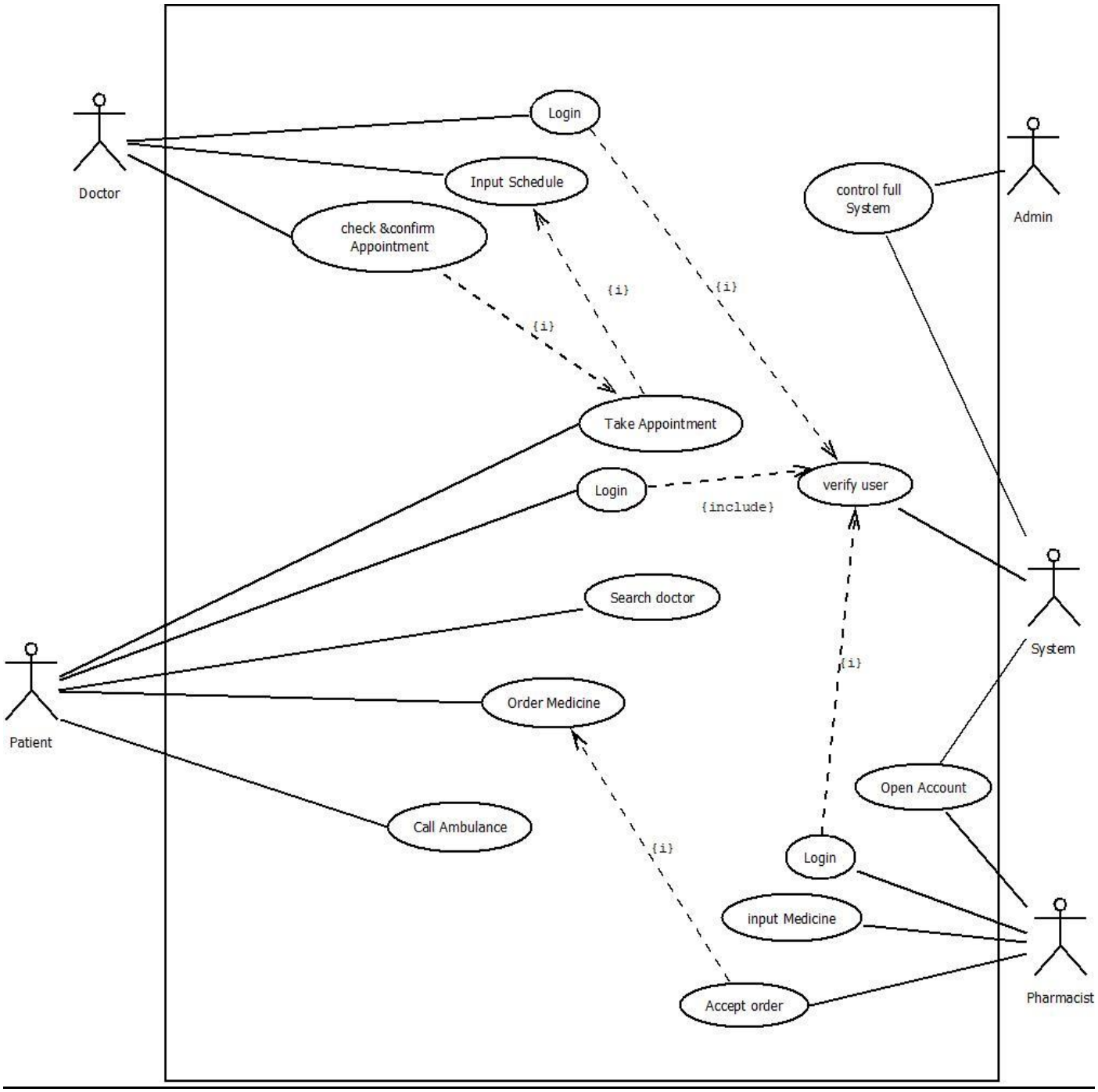
- 24/7 service.
- Doctor's availability time information display.
- The digital receipt display, print and download.
- Touch screen menu selection.
- Multiple appointment can be done at a time.
- Limit the number of appointments at the same time for a user.
- Available search function for all the functionalities.
- Credit card transaction.
- Online payments gateway that's support in our country.

UML Diagrams (Optional)

ER Diagram:



Use Case Diagram:



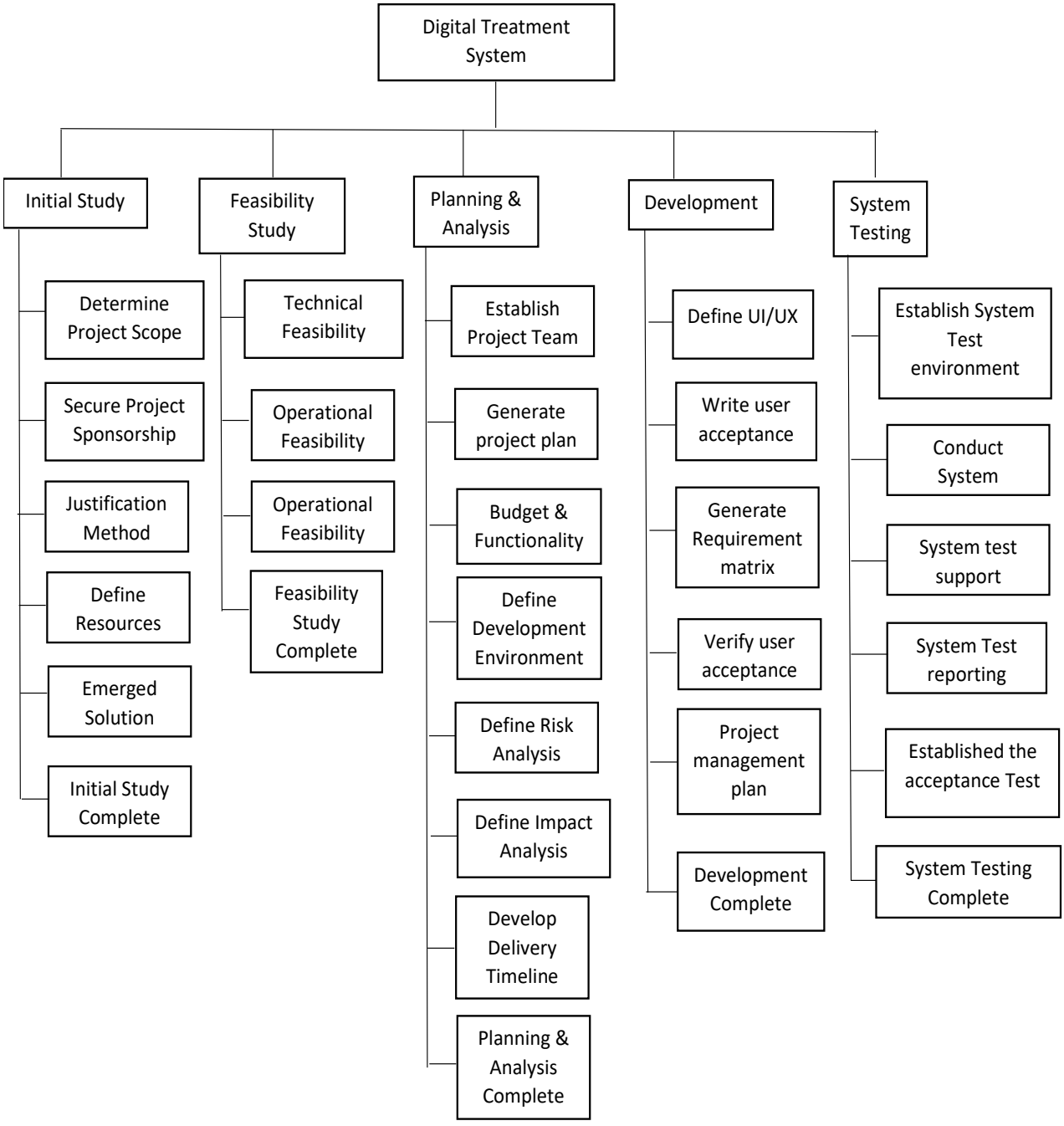
3. Social Impact

It helps the society with the advancement of our treatment system in medical sectors. Now this is the time of pandemic and every day we are facing trouble with the treatment system of our country. Besides the pandemic, it's always been a trouble for people from get an appointment to do tests in different pathological centers. People has to maintain a big line to get appointment, to do tests in hospitals and pathology centers. Our system will provide an automated system to the users so that they can save themselves from wasting time and hassles. Also as we provide online medicine delivery, ambulance calling so that people can easily overcome these issue related problems. Moral of the fact is our system will automate the treatment system of our country which will be a great scope to digitalize the treatment system of our country.

4. Development Plan

Process Model: To develop a project, we must follow a process model. There are many software process models like DSDM, Scrum, Waterfall, XP and so many. Among them, we choose Scrum as our process model. The reason behind choosing scrum is - in scrum, client can make change in project requirements before starting iterations. Client can participate in making product backlog. As a result, every confusion between client and development team are solved easily. Moreover, a scrum team will have more than three and less than nine members and according to our estimation through Cocomo model, we have 5 members in total. The most important reason behind choosing scrum is- it's working process. In Scrum, project start from the product backlog. In product backlog, every requirement-related work, estimation, designs are added. After that sprint backlog is created with the prioritized requirement which will be developed in the next sprint. Sprint is the development phase of the project where every development-related work such as coding, testing are done. Usually, a sprint takes two to four weeks. In this development time, client can't make any change. After completing all tasks project goes to post-game phase and if everything is okay then finally project is handed to the client. Thus the whole working process of scrum which is easy and beneficial for both client and software firm.

Work Break-Down Structure



Schedule Task

Task	Duration (Days)	23.05.21 to 11.06.21	12.06.21 to 20.06.21	21.06.21 to 30.06.21	01.07.21 to 21.07.21	22.07.21 to 10.08.21	11.08.21 to 02.09.21	03.09.21 to 15.10.21	16.10.21 to 06.11.21	07.11.21 to 21.11.21
Initial Study	**30**									
Feasibility Study	**20**									
Analysis/Project Requirements	**25**									
Planning Phase	**35**									
Designing & Modeling	**25**									
System Testing	**30**									
Development Phase	**75**									
System Testing	**35**									
User Acceptance Test & Training	**25**									
Total Time	**300 Days ± ~ 330 days**									

Estimation: To conduct any project we must calculate total effort, development time and manpower. It helps to predict the overall project before starting it. It also helps the project manager to monitor the project. There are a lot of models available for doing estimation. In our case, we choose COCOMO model to calculate our project effort, development time and manpower. COCOMO is a constructive

cost model where calculations are done based on a line of code. Our project is an online treatment-based website that is an organic project.

Software Project Type	Coefficient	P	T
Organic	2.4	1.05	0.38
Semi Detached	3.0	1.12	0.35
Embedded	3.6	1.20	0.32

PM: Person-month needed for project

SLOC: Source lines of code

P: Project complexity (1.04 – 1.24)

DM: Duration time in months for project

T: SLOC dependent coefficient (0.32 – 0.38)

- **Effort = PM = Coefficient$_{<\text{Effort Factor}>}$*(SLOC/1000) ^P**

  = 2.4*(16000/1000) ^1.05

  = 44.110 Person-month

- **Development Time = DM = 2.50*(PM)^T**

  = 2.50*(44.110) ^0.38

  = 10.540 ~ 11 **(Month)**

- **Number of People = ST = PM/DM**

  = 44.110/10.540

  = 4.185 ~ 5 **(Person)**

Risk Analysis:

S/N	Risk Description	Probability	Impact	Mitigation Plan
01.	Team members missing because of sickness.	10%	Moderate	Need to check health before starting the project and remain conscious about health.
02.	Less reuse than planned.	10%	Low	Extra precautions should be taken.
03.	Funding shortage.	50%	High	Manage funding members for backup.
04.	Lack of training on tools.	50%	Significant	Need to identify all tools before starting.
05.	Staff inexperienced.	35%	Significant	Take some experienced staff in team.
06.	Time spent on requirements development	10%	Low	Save time while doing requirements development.
07.	Unstated requirements	15%	Significant	There will be no significant.
08.	Requirement's prioritization	50%	High	Take client opinion while prioritizing.
09.	Requirements understanding	20%	High	Need to understand whole project before starting.
10.	Expanding project scope	20%	High	Project scope should be set with both parties understanding.

5. Marketing Plan

We are supposed to build an automated digital treatment system where users can book their appointment, call ambulances and do savings by comparing the price of different pathology centers. For the marketing of our system, we can use newspaper advertisements, tvc ads. We can call seminars to let people to know about the system. We will definitely use social media advertisement where we will share the experience of the people who are already used our system. We will offer special promo codes for their booking the first two or three appointments to the

users. We can use banners and make posters so that people can to reach our system more and more. We can also take the help of digital marketing to spread our promotions more effectively.

6. Cost and Profit Analysis

Project Budget

Total Person Cost = 44*11*5*1000= 24,20,000 TK
Office Rent: 8000*11 = 88,000 TK
Utility cost = 10000*11 = 1,10,000 TK
Others requirement cost = 30,000 TK
Maintenance Cost = 40,000 TK
Marketing Cost = 50,000 TK

Development Cost = (Total Person Cost + Office Rent + Utility cost + Others requirement cost + Maintenance Cost + Marketing Cost)
= (24,20,000 + 88,000 + 1,10,000 + 30,000 + 40,000 + 50,000) TK
= 27,38,000 TK

Total = Development Cost + Development Cost * 0.15 [with 15% benefit]
= 27,38,000+ 27,38,000*0.15
= 31,48,700 TK

We want to profit 15% in this project. So, our profit margin will be = (31,48,700 - 27,38,000) TK
= 4,10,700 TK