American International University-Bangladesh (AIUB)
Department of Computer Science
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Online Hospital Management System

(**Category:** A **Option A:** Web)

Software Requirement Engineering

Sec: **A**

Project Submitted

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TABLE OF CONTENTS

1. Problem Domain

1.1 Background to the program

Hospital management system is a computer system that helps manage the information related to health care and aids in the job completion of health care providers effectively. It has ever since been evolving and synchronizing with the technologies while modernizing healthcare facilities. In today's world, the management of healthcare starts from the hands of the patients through their mobile phones and facilitates the needs of the patient. There were some critical issues facing the hospital system, such as:

- Lack of Healthcare specialist nature.
- The lack of time allowed training and learning on making of use hospital management system
- The lack of healthcare professional support, motivation.
- lack of patient safety and quality care.
- Problem of access to care.
- Doctor related issues.
- Population health management.

1.2 Solution to the program

Hospital management systems allows us the ability to optimize and digitize all the processes within the institution, which will help to improve customer service, reduce process costs, streamline the search of medical records, bills, patients, doctors, etc. This project helps to helps to store all the kinds of records, provide co-ordination and user communication, implement policies. This management can be improved by following some rules:

- Training of hospital staff.
- Use innovative technology.
- Keep contact details updated.
- Remain patient centered.
- Develop an Effective communication strategy.
- Identify vulnerable areas.

2. Solution Description

2.1 System Features

In our Hospital Management System there will be 4 types of users –

- Admin
- Doctor
- Accountant
- Patient

All the users will have some tasks to perform. Those features are given below-

2.1.1 Functional Requirements:

Admin:

- Admin can login with his/her id and password
- Admin can update his/her own profile
- Admin can logout from the system anytime he/she wants
- Admin can add new employee
- Admin can edit employee's data to the system
- Admin can update employee's data
- Admin can delete employee's data from system
- Admin can search any employee/doctor/patient
- Admin can view Doctor/Patients profile
- Admin can view monthly profit/loss report

Doctor:

- Doctor can login/logout to the system
- Doctor can edit his own profile
- Doctor can view his profile
- Doctor can view Patient list
- Doctor can search his patient
- Doctor can upload patients' prescription

Patient:

- Patient can login with their id and password
- Patient can edit his profile
- Patient can view doctors list
- Patient can make online transaction
- Patient can download prescription

Accountant:

- Accountant can login to the system with their password
- Accountant can view patients' data
- Accountant can assign patient to a doctor
- Accountant can view doctors' availability list
- Accountant can view monthly profit/loss report

2.1.2 Quality Attributes

2.1.2.1 Usability:

- The system should be responsive and user friendly
- User Interface should easily be identical to the system
- All types of users from Android, iOS should use the system
- Searching feature should be fast and smooth

2.1.2.2 Reliability:

- System's information should be reliable and secured

- Users' data should be stored properly and with security
- Proper Server should be used to maintain clean performance
- Reliable Domani name (.com) should be used

2.1.2.3 Accessibility:

- All types of users should use the system properly
- System will support Language change option according to users
- All types of devices should support the system
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2.1.2.4 Maintainability:

- System should be easily maintainable
- System should be maintained by good developer and engineer
- Users should be informed when the system needs maintenance break

2.1.2.5 Availability:

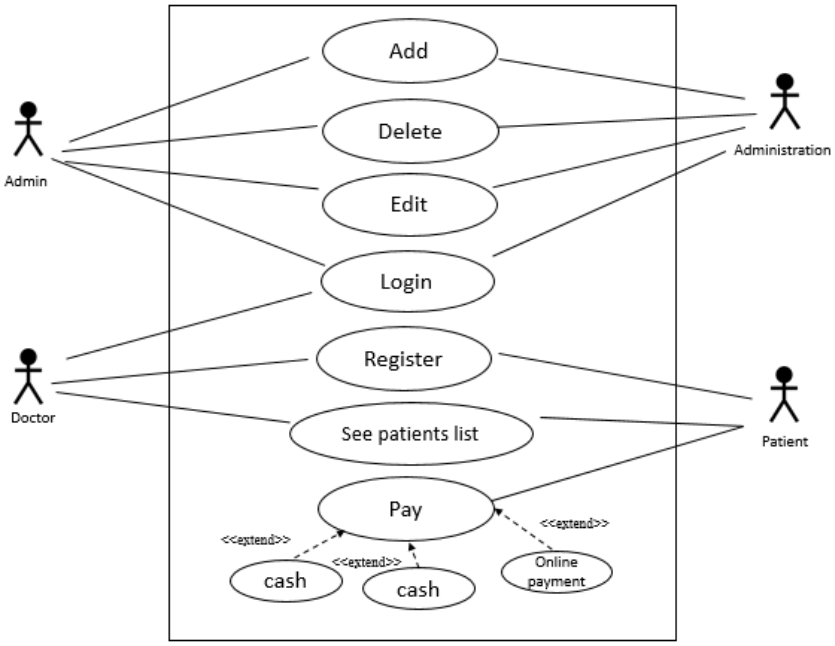
- All Modern browsers should support the system
- All Types of devices and Operation system should be supported

2.1.2.6 Security:

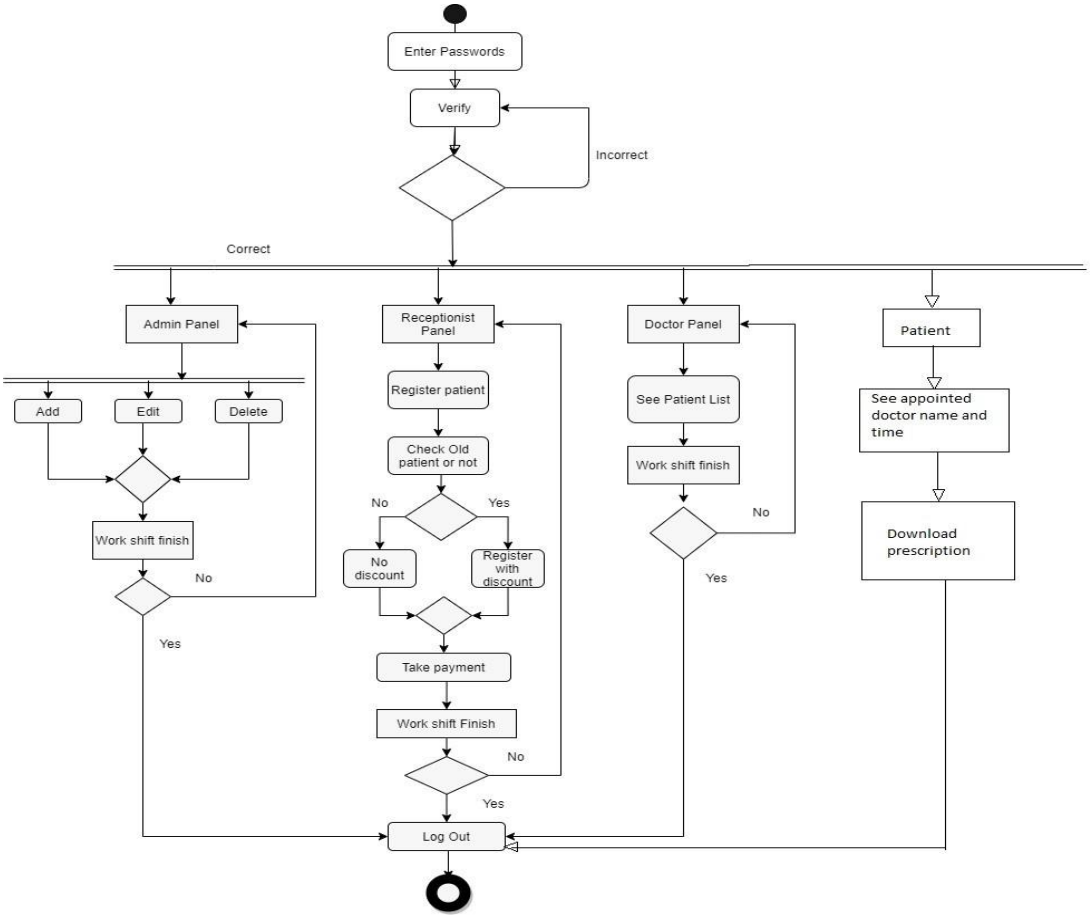
- System should use proper authentication and validation
- User should change his password easily whenever they need
- Users' data should be stored with proper security
- Database should be reliable

2.2 UML Design:

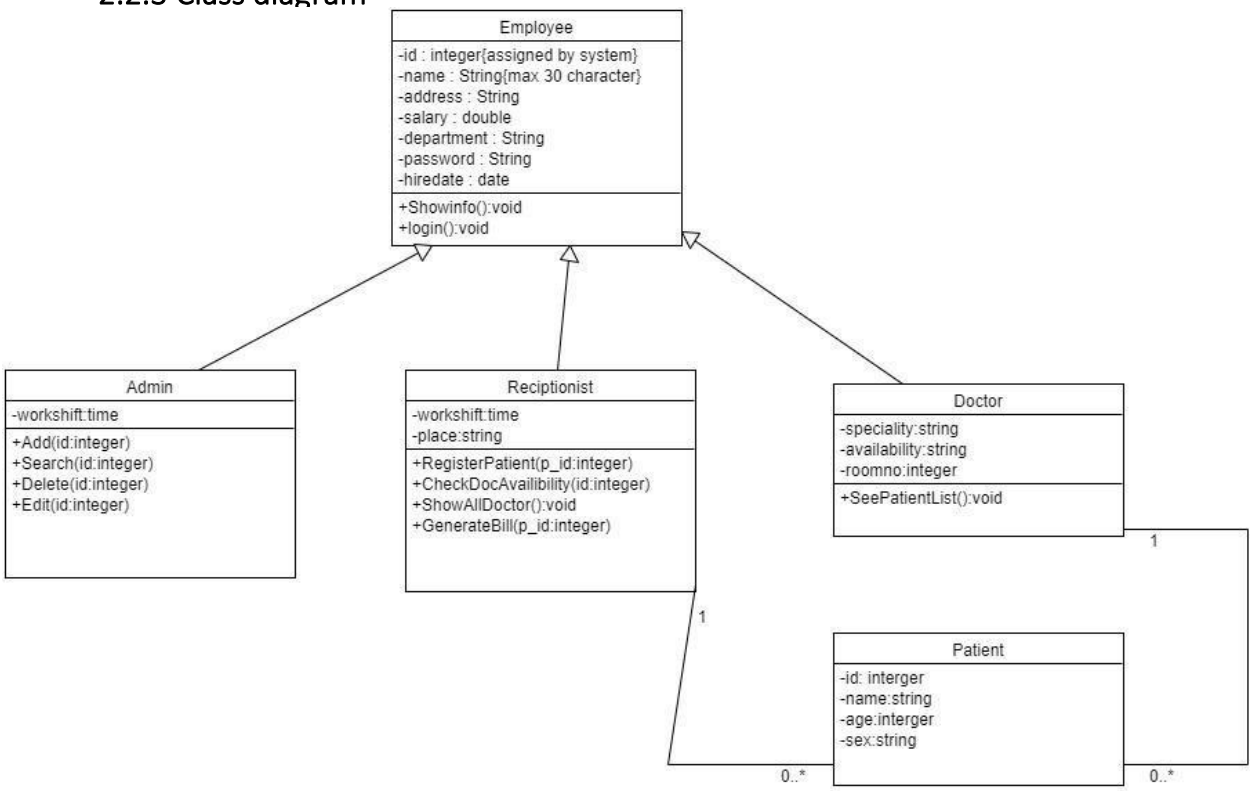
2.2.1 Use case diagram



2.2.2 Activity diagram



2.2.3 Class diagram



3. Social impact:

This system will benefit society because all processes would be transparent. Everything will be done through this system, from doctor's appointments to prescriptions. Patients in our country frequently struggle to interpret a doctor's prescription due to bad handwriting. This system will type prescriptions and distribute them to patients' accounts, removing the potential of misinterpretation. Another aspect is that if a patient arrives before the doctor's supervision, the doctor can track them down using the system. Because the system will keep track of all the information, including check updates. Patients can also find out about the specific doctor's schedule. This is a typical issue in our country, where people can select their doctor based on their specific needs. As a result, they will gain from this system. People can also use the internet to access the clinic system, and those who have trouble getting to the clinic can arrange an appointment from home. Patients may misplace their consulting prescriptions on occasion. There will be no need for paper in this system because everything will be saved in a database. As a result, the clinical system will have a brighter future, and medical infrastructure will improve.

4. Development Plan:

4.1 Project Organization

At first, the team structure will be formed up to divide the work and make it arranged. After that, managers of the project will be assigned, and their responsibilities will be distributed. Managers will make their team as their wish and project manager will make the team where the team does not have any manager.

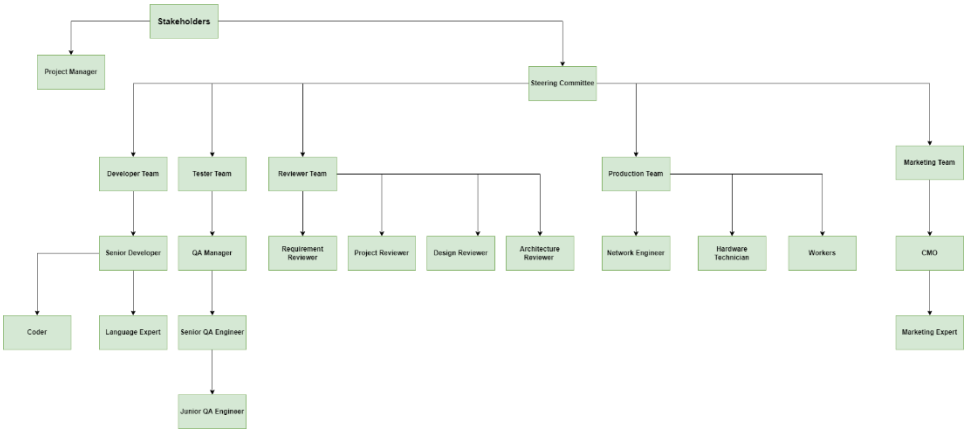


Figure: Project Organizational Chart [Tool Used: Draw.io]

4.2 Project Management

The project manager will identify the development stages, estimate the workload, and submit estimates in this segment. Throughout the project, this development plan will be updated on a regular basis. However, developers will make every effort to maintain to the schedule.

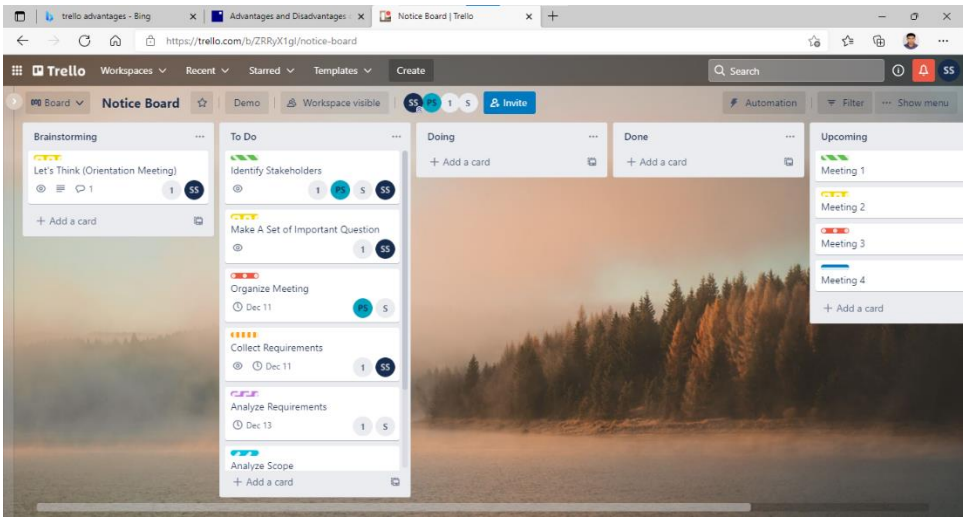


Figure: Project Schedule [Tool used: Trello]

4.3 Project Control

In this segment, the team and stakeholders will take actions and approaches to oversee the quality of the project and the team's efficiency. Mentionable actions and approaches are:

- **Schedule monitoring:** The time constraints will be set up and everyone will be notified at the beginning of the project so that team can be aware of it. In addition, the schedule will be updated accordingly by using project management tool (Trello).
- **Compliance with requirements:** The developers will create strategies and plans, as well as tools, to ensure that the requirements are fulfilled
- **Budget monitoring:** A budget constraint will be established, and everyone involved in the project will be informed of it at the start. A part of the budget will be for the backup cost for the project.
- **Quality assurance:** Tools will be specified to assure the quality of the project. All the requirements, scope, coding standards, ethics will be reviewed by QA team.
- **Management:** Project manager will manage all the teams and set up a strategy plan to change the stakeholders depending on cooperation approaches, communication methods and team methodology.
- **Problem solving**: The management part will provide step-by-step procedures for resolving conflicting situations. If the problem becomes too large to handle, the project manager will make the final decision.

- **Risk prevention:** The team should have a backup of their work and should mention the name of the tools they used. All the requirements change requests should be properly collected, analyzed, and negotiated, and documented to avoid project failure. Agile software development techniques will be used to ensure the deadline.

4.4 Maintenance and support

After the project is completed, the maintenance phase will begin. The QA team will give a separate plan for testing, and developers will be held accountable for any technical errors discovered in code. They must manage technical debt as well as code quality control. Furthermore, the development should give sufficient documentation, which includes a complete inventory of all documents. Finally, a development strategy for post-release collaboration between the product owner and the vendor should be created.

5. Marketing Plan:

5.1 Analyze the market

To find out if there are any other websites like this and what people want, primary and secondary research will be conducted. There will be interviews and surveys in primary research to get a better sense of the market's needs. Secondary study will also include an estimate of how many people will utilize the product in the future. After that, competitors will be mentioned with their features, facilities, website traffic, and social network connectivity. These findings will help us understand what other products offer that our marketing doesn't and how to position it. SWOT analysis will be used to identify strengths, opportunities, and threats, as well as ways to mitigate or eliminate them. This SWOT analysis will be updated in the marketing phase, and after studying it, new marketing tactics will be devised.

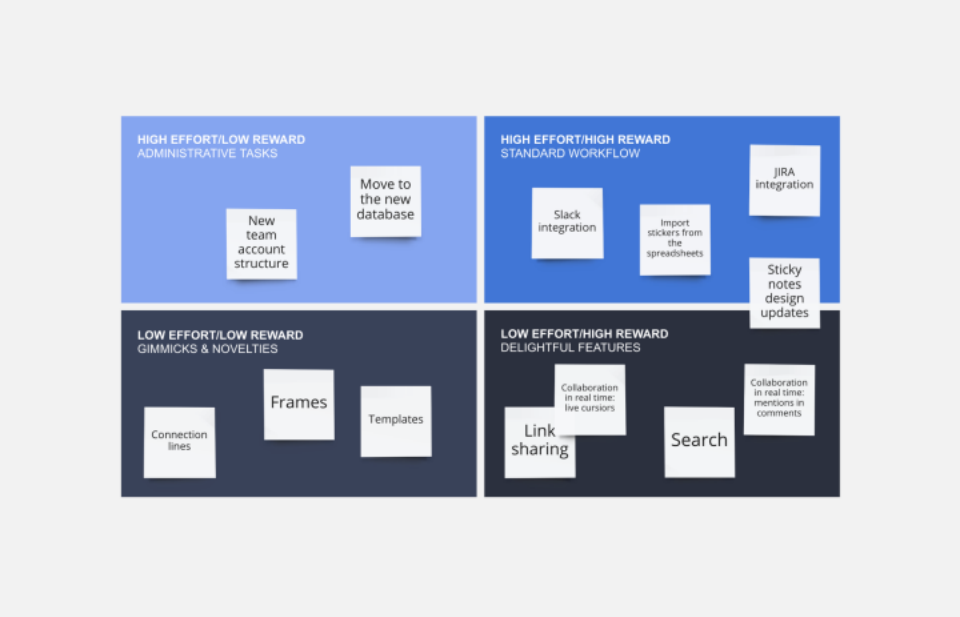


Figure: SWOT analysis [Tool used : Miro]

5.2 Define target audience

Targeted audiences will be defined based on demographics, such as age and gender. There will initially be an emphasis on city dwellers, as the majority of villager's won't be able to use the internet or similar amenities. Those between the ages of 25 and 40, on the other hand, are more likely to have a working knowledge of technology. That's why it's fun for them and their parents to use. If you're targeting businesspeople, you'll find this handy because they're looking for something that's convenient for them.

5.1 Develop positioning and messaging

When creating a product message, it's important to answer questions like, "Who is this product for?" What is the purpose of this item? Just what makes this product unique? This product's message will be used in social media promotions.

5.1 Promotion strategy

This program needs to be promoted on social media in order to get noticed. Google ad sense can also be used to create adverts that appear on YouTube and other websites. TV commercials can also be made if there is no money shortfall. It's still the most successful marketing tactic to create content. Brand loyalty and more organic leads can be generated as a result. When you provide content that

is relevant, valuable, and encourages potential customers to take action, you earn their trust. Your product's industry will be the focus of landing sites, blogs, videos, podcasts, and info graphics. Search engine optimization and social media marketing are also included in this.
Finally, the marketing team will revise the strategy, prepare a launch plan, and monitor the product's performance.

6. Cost and Profit Analysis

The following assumptions can be made about the costs for the project application for the first year:

Items	Daily Cost (BDT)	No. of Days	Total Cost (BDT)
Requirement engineer	700	15	10500
Designer	600	7	4200
Planning	1200	7	8400
Front-end developer	800	80	64,000
Back-end developer	1200	80	96,000
Testers	550	25	13,750
Total Development cost			BDT 196,850

Overhead Cost (20%)			28,300
SafetyNet for spillover (10%)			14,150
Cloud Server		365	260,000
Warehouse storage for medicine		365	360,000
Total with safety			BDT 803,950
Marketing	500	365	196,850
Total cost			BDT 1663 ,250

6.1 Profit suggestion and calculation

Having a well-known online system and an easy-to-navigate website will lead to a significant number of patients registering. Because people will be able to book doctors directly from the online platform, prices will be reduced, and consequently profit margins will be much higher, according to the findings of this study. Thus, our earnings might climb by 25% or more if Dhaka's population of 21 million people in 2020, up from 18 million in 2016, is considered. According to our projections, our website can expect 1.05 million visitors if we can attract at least 5% of the population this year, providing that they are enticed by exclusive deals. Our patients will be more likely to refer their friends and family to us if our care facilities are up to snuff. At least BDT 5.25 million per month will be generated by each patient who generates a profit of at least BDT 5 per month, which will help us grow as our patient base grows and we invest more in the website system as well as in treatment. Finally, if the plan is successful, it will attract a huge number of patients, putting pressure on our competitors in the market. Fees, on the other hand, will be reduced since more individuals will be enticed by the prospect of making money through it. In the coming years, we will have a stable patient base

that will continue to come to us for care because of our lower pricing and better discounts than most hospitals.