

American International University-Bangladesh (AIUB)  
**Department of Computer Science  
Faculty of Science &Technology (FST)  
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**AN ONLINE MEDICAL SYSTEM**

Software Requirement Engineering

Sec: **B**

Project submitted

By

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1. **PROBLEM DOMAIN**
   1. **Background to the Problem**

The main objective of this project is to create an online medical solution (web based) where patient can access their medical details, help booking the appointment with doctor and help seeking medical advice from doctors. The project will be developed for the clients and can be adapted at any moment of the development process.

During the COVID-19 pandemic in Bangladesh, it is hard for any patients to go find solution or consult from the doctors about their health issues. People can get sick in late at night where it is difficult for them to find any medical solution which can be life threatening. The emergency can arise at any moment during the pandemic so it will be hard for the patient to go about to seek solution. Patient need to find doctors in those specialist areas according to their symptoms. It is also hard for the hospitals to keep records of the patients effectively as paper-based system to take appointment is becoming too tedious. With the increasing patients day-by-day at an alarming rate manual system becoming too hard to manage by the hospital staffs. It is also hard for any hospitals to maintain the salaries, expenses, profits, charges properly which is hard to manage if there is no system. So, the project's goal is to solve the problem and propose a better solution.

* 1. **Solution to the Problem**

**1.2.1. Existing Solutions**

* Patients have to fetch information from the doctors by going or calling the doctor manually.
* Patients have to appoint manually by going to hospital.
* Hospitals have to keep the records manually.
* Hospitals have to perform the calculation of their expenses and profits manually.

**1.2.2. Proposed Solutions**

* The system that will be proposed will eliminate the need for any patients to go out and seek any doctors.
* Patients can do online appointments with doctors without ever needing for them go out and do it manually.
* Hospitals can store records of all their stakeholders.
* Hospital can perform daily profits, expenses and can also manage salary of every employees.

**1.2.3. How the proposed solutions will work**

* Patients can register in the system and search any doctors by stating their symptoms and seek medical help.
* Patients will also option to appoint and let the doctor know from the system.
* Admin can perform CRUD operation for the patients, doctors, employees etc.
* System can calculate the expenses and profits by performing the calculation from the formula and record salary of every employee monthly.

1. **SOLUTION DESCRIPTION**
   1. **System Features**

**2.1.1. Functional Requirements**

Stakeholders of an online medical system and their functionalities in the system are given below:

**Patient**

* Can view the list of the doctors and their specialty
* Ability to search the doctors by stating the symptoms
* Can write the doctors about their health issues in online
* Can make appointment
* Can send request for appointment
* Can cancel appointment
* Can pay his/her bill online
* Can view prescriptions
* Can request Ambulance

**Doctor**

* Can view the list of his patients and their details
* Can give feedback about patient's health issues
* Can prescribe medicine to any patients
* Can view the patient reports
* Receive payment from the system

**Doctor's Assistant**

* Can accept the appointment request from patients
* Can register patients under the doctor he/she is working with
* Can cancel the appointment request from patients
* Can reschedule any appointment
* Can provide any special need for the patient like discount
* Can send ambulance to patient's home if any patient request

**Receptionist:**

* Can store patient information
* Can see any patient status
* Can check room availability for booking
* Can book room for the patient
* Can generate bills for the patient from the system
* Can calculate hospital expenses and profits

**2.1.2. Quality Attributes**

Some of the quality attributes or non-functional requirements in our proposed system are given below:

**Security**

* System will lock out any user after fifth unsuccessful attempt
* System will logout any user automatically after 10 minutes
* Any modification to the user's detail like CRUD will be handled by the admin

**Performance**

* System supports the capacity of 600 users
* The functionality of the system must have a response time of 1-2 seconds

**Availability**

* Patient or any user can access services 24 hours in a day and can ask for any information
* Doctor will only be able to see ill patients in his specialty

**Maintainability:**

* System has the ability to back up the data.
  1. **UML Diagrams**

**Use Case Diagram**

**An Online Medical System**

include

include

extend

extend

extend

include

include

extend

extend

**Class Diagram**

+1

+1

Pay Bill

Treatment

|  |
| --- |
| **Patient** |
| +p\_id: Integer  +p\_name: string  +p\_mobile: integer  +p\_age: integer  +1..\*  +p\_sex: string  +p\_address: string |
| +Login()  +Regsiter()  +SearchDoctors()  +WriteIssues()  +MakeAppointment()  +CancelAppointment()  +RequestAppointment()  +RequestAmbulance()  +PayBill()  +ViewPrescription() |

|  |
| --- |
| **Doctor** |
| +d\_id: Integer  +d\_name: string  +d\_mobile: integer  +d\_age: integer  +d\_sex: string  +d\_address: string  +d\_designation: string |
| +Login()  +Regsiter()  +ViewPatient()  +FeedbackPatient()  +PrescribePatient()  +ViewReports()  +RecievePayment() |

+1..\*

+1

Appointment

|  |
| --- |
| **Receptionist** |
| +r\_id: Integer  +r\_name: string  +r\_mobile: integer  +r\_age: integer  +r\_sex: string  +r\_address: string |
| +Login()  +Regsiter()  +StorePInfo()  +CheckPatientStatus()  +CheckRoomAvailability()  +BookRoom()  +GenerateBill()  +CalculateHospital() |

|  |
| --- |
| **Doctor's Assistant** |
| +a\_id: Integer  +a\_name: string  +a\_mobile: integer  +a\_age: integer  +a\_sex: string  +a\_address: string |
| +Login()  +Regsiter()  +AccepAppointment()  +CancelAppointment()  +RescheduleAppointment()  +RegisterPatient  +ProvideDiscount()  +SendAmbulance() |

+1

1. **Social Impact**

Doctors save lives, but their importance goes far beyond that. Doctors also make a difference by helping patients minimize pain, recover from a disease faster or learn to live with a disabling injury. A patient's ability to enjoy life, even if they can't be cured, makes a huge difference to them and to their families. If they can go back to work after an illness, that benefits their employer, too. And, that's only part of what makes doctors important to society.

But sometimes we find a terrible situation to find a doctor in times of emergency. We can't find the doctors contact numbers or don't know how to contact. Somehow if we manage to contact a doctor, we don't know is he free or not. But we can solve all those problems by using our apps. We can find doctors free slot, doctors contact number, doctor's qualification and every details of a doctor from our home. So, by using that apps we can save our time, we can get our best treatment from our nearby doctors and also, we can contact a doctor within a minute in a emergency that's helps a society a lot.

1. **Development Plan**

To create an online medical system, Extreme Programming (XP) as SDLC cycle process will be used. XP is well suited since our team composed of four members as it is a small sized team and it will be perfect for this following proposed system. XP is an agile based software distribution method. First phase in XP is the exploration phase. In exploration phase, the customers will write the story cards about the requirements which will be included in first release. Our team members will familiarize with the tools and the whole exploration phase process takes aboutfew weeks to months. Second phase is the planning phase. In the planning phase, user stories will be written by us and priorities will be given to implement the stories and plan out the release schedule. Third phase is the iteration phase. In iteration phase, to develop the proposed software it will go through several iteration phases which will take one to four weeks to implement before first release. Our team members will get decision from the customers for each iteration and at the end of last iteration it will be ready for deployment. Fourth phase is the productionizing phase. In productionizing phase extra testing will be performed by the members and the changes can be found while doing it and those will be documented for later implementation. Then the system will be ready for the first release. Fifth phase is the maintenance phase where there will also be new iterations and customer will ready their final stories for implementation. Sixth phase is the death phase. In death phase, the customer no longer will have any stories to tell for implementation. Our members will also show system performance and reliability and documents will be finalized for the final release. In this way by following the six phases in extreme programming our online medical system will be developed.

1. **Marketing Plan**

It pays to understand the ins and outs of our services and products when developing a practical marketing strategy for our healthcare sector. If we understand the back and front of your services and goods, our marketing will be far more productive, cost-effective, and result-oriented. In reality, designing a comprehensive healthcare marketing strategy takes the hassle out of it. We need to carry out a comprehensive audit of your services and goods with that said. This way, we will build a matrix that aligns the patient identity with these services. Who's the target patient for us? In healthcare facilities, what are they looking for? What patient concerns are our programs hoping to resolve? We would be in a stronger position to market them more effectively and without much hassle by making sure we have a clear-cut understanding of what our services and goods are, why they are needed, and how your target audience perceives them.

1. **Cost and Profit Analysis**

A cost-profit analysis is a process businesses use to analyze decisions. The company or analyst sums the benefits of a situation or action and then subtracts the costs associated with taking that action. Some consultants also build models to assign a dollar value to intangible items, such as the benefits and costs of living in a particular town.

Before building a new plant or taking on a new project, prudent managers conduct a cost-benefit analysis to evaluate all the potential costs and revenues that a company might generate from the project. The investigation outcome will determine whether the project is financially feasible or if it should pursue another project.

As we've seen, the cost of making an online healthcare website depends on its type, which defines a set of features and their complexity. The choice of a platform will also impact expenditures. Let's examine the most prevalent healthcare website types and their essential elements.

Previous studies have shown limited availability of medicines in health facilities in Bangladesh. While medications are dispensed for free in public facilities, they are paid out-of-pocket in private pharmacies. Availability, price, and affordability are critical concerns for access to medicines in Bangladesh.

Determining the factors that impact implementing a professionally designed, custom medical website is similar to building a custom home or buying a car with varying option packages. We have outlined the factors that we believe to be universal in assessing the actual costs of a website

Cost profit analysis illuminates how changes in assumptions about cost behavior and the relevant range in which those assumptions are valid to affect the relationships among revenues, variable costs, and fixed costs at various production levels. Generally, a minimum of 30k to 50k is required to build an online medical website in Bangladesh. Cost amounts can be varied with the facilities that are provided. We find that fixed costs account for 70% of total costs for the hospital of interest, and variable expenses were 30% of total costs. Inpatient departments accounted for 86% of total costs, and outpatient departments were 14% of total costs. Results of the breakeven analysis illustrate that several departments charge sufficient fees to cover all unit costs. Results provide useful information about unit cost based on four categories: (1) unit cost per admission of each department, (2) unit cost per patient day of each department, (3) unit cost per entry with annual capital cost of each department and (4) unit cost per patient day with the yearly capital cost. Our results provide hospital cost information that decision-makers can use to expand healthcare services to increase sustainability and profitability. The use of cost analysis by administrators and regulators will improve the quality of financial information and enhance the efficient use of scarce resources.