American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

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E-hospital management system

Software Requirement Engineering

Sec: B

Project submitted By

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1. Problem Domain

1.1 Background To The Problem:

The healthcare sector faces significant challenges in terms of operational efficiency, patient care, and resource management. With the increasing demand for healthcare services, traditional systems often struggle to streamline processes and provide timely and accurate information. A solution is required to deal with these problems, guaranteeing enhanced patient outcomes, increased healthcare professional coordination, and resource optimization.

The root cause of the challenges in the healthcare sector lies in outdated and inefficient systems, often characterized by manual processes, fragmented information, and a lack of interoperability among various healthcare components. The importance of addressing these issues is underscored by the critical nature of healthcare services and the impact on patient well-being. Ineffective management systems can lead to delays in treatment, errors in patient care, and misallocation of resources. The increasing demand for healthcare services, coupled with advancements in medical technology, highlights the urgency of adopting modern, integrated solutions to ensure a streamlined and patient-centric healthcare environment. Improving the infrastructure and management processes is crucial to meet the growing healthcare needs and enhance overall system effectiveness.

1.2 Solution of the problem:

By implementing the E-Hospital Management System online to deal with the problem. The most important message would be how the system can be beneficial for both consumers and the service providers in terms. The proposed solution addresses the root cause by promoting interoperability, efficiency, and data-driven decision-making. Integrated health information systems and cloud-based solutions ensure that relevant information is accessible across the healthcare continuum, fostering collaboration and improving overall system efficiency. Additionally, they can book an appointment online using cards and online payment gateways. Therefore, people can save their time. There is no more suffering to get service from the hospital. Moreover, the hospital will be able to keep track of records, making it easier for them to manage the entire process.

Software description:

Patients have to select the appointment. Then, the software will show the available slots, and they have to choose a doctor. After that, it will display the available slots and doctors. Upon confirming, the system will directly proceed to the payment page, and patients have to pay through cards, Bkash, Nagad, etc. When the payment is completed, the site will automatically update the server, signifying the update in the whole system. Patients can see the schedule and other details like available slots of a doctor and patients serial number.

2.Solution Description:

2.1.System Features:

- **User Authentication:**

  Allow users to create accounts and log in securely.

- **Appointment Selection:**

  Provide a user-friendly interface for patients to select an appointment date and time.

- **Doctor Selection:**

  Display a list of available doctors for the chosen time slot.

  Appointment Confirmation.

- **Appointment Confirmation:**

  Allow patients to confirm their selected appointment details before proceeding to payment.

- **Payment Gateway Integration:**

  Integrate payment options such as credit/debit cards, Bkash, Nagad, etc.

  Ensure secure and encrypted transactions.

- **Schedule and Details Display:**

  Provide a dashboard for patients to view their scheduled appointments.

  Display available slots for each doctor.

  Include details such as doctor's name, appointment date, and time

- **Patient Serial Number:**

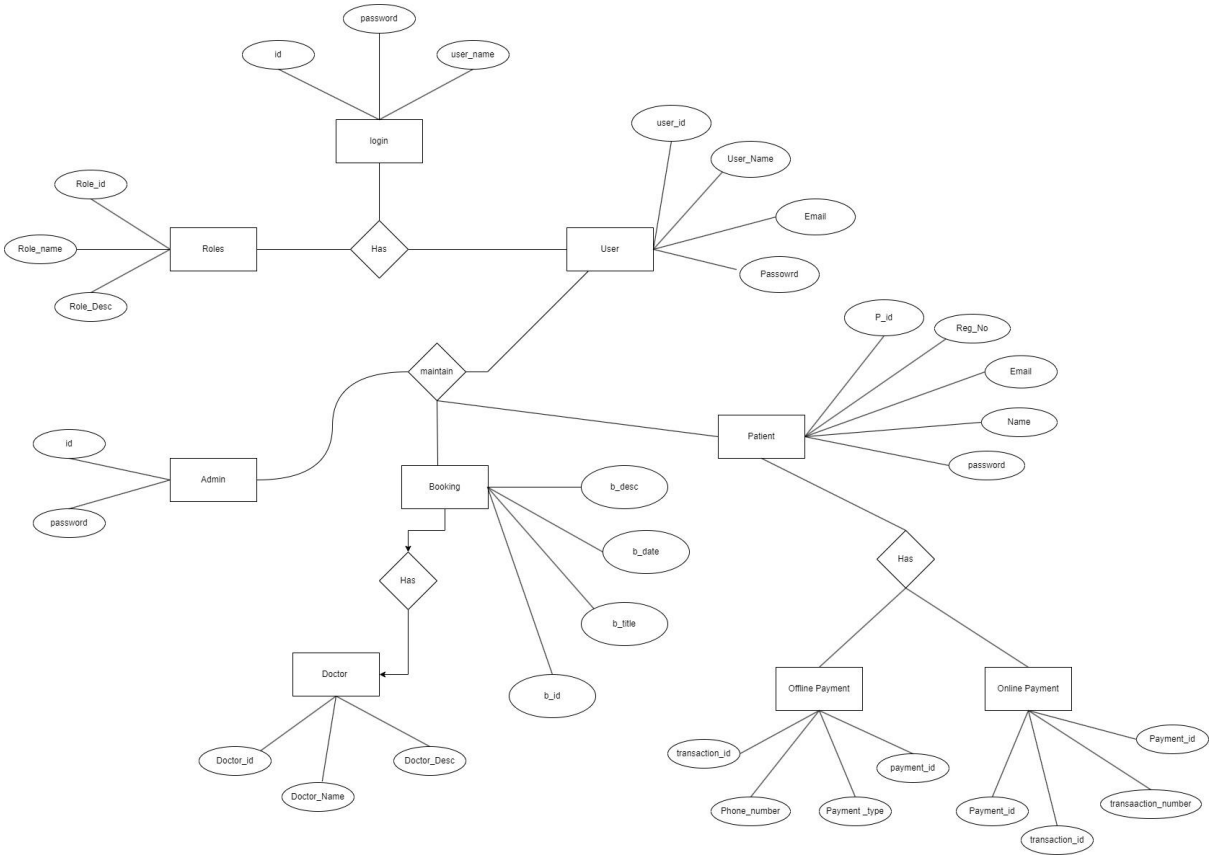
  Assign a unique serial number to each patient for easy identification and tracking.

- **Cancellation and Rescheduling:**

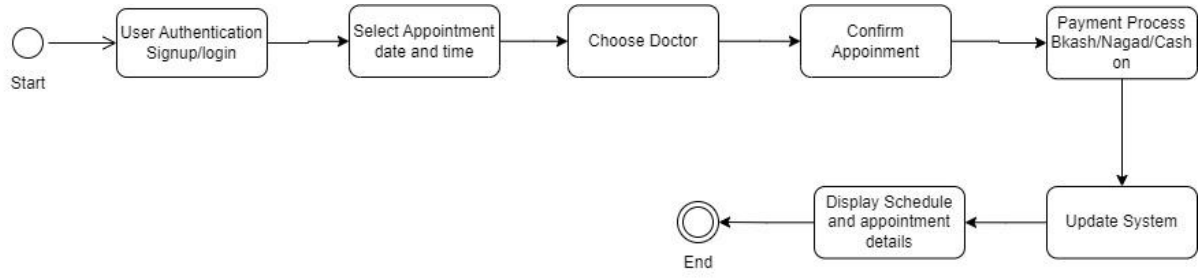
  Allow patients to cancel or reschedule appointments within a specified time frame.

2.2 UML Diagram

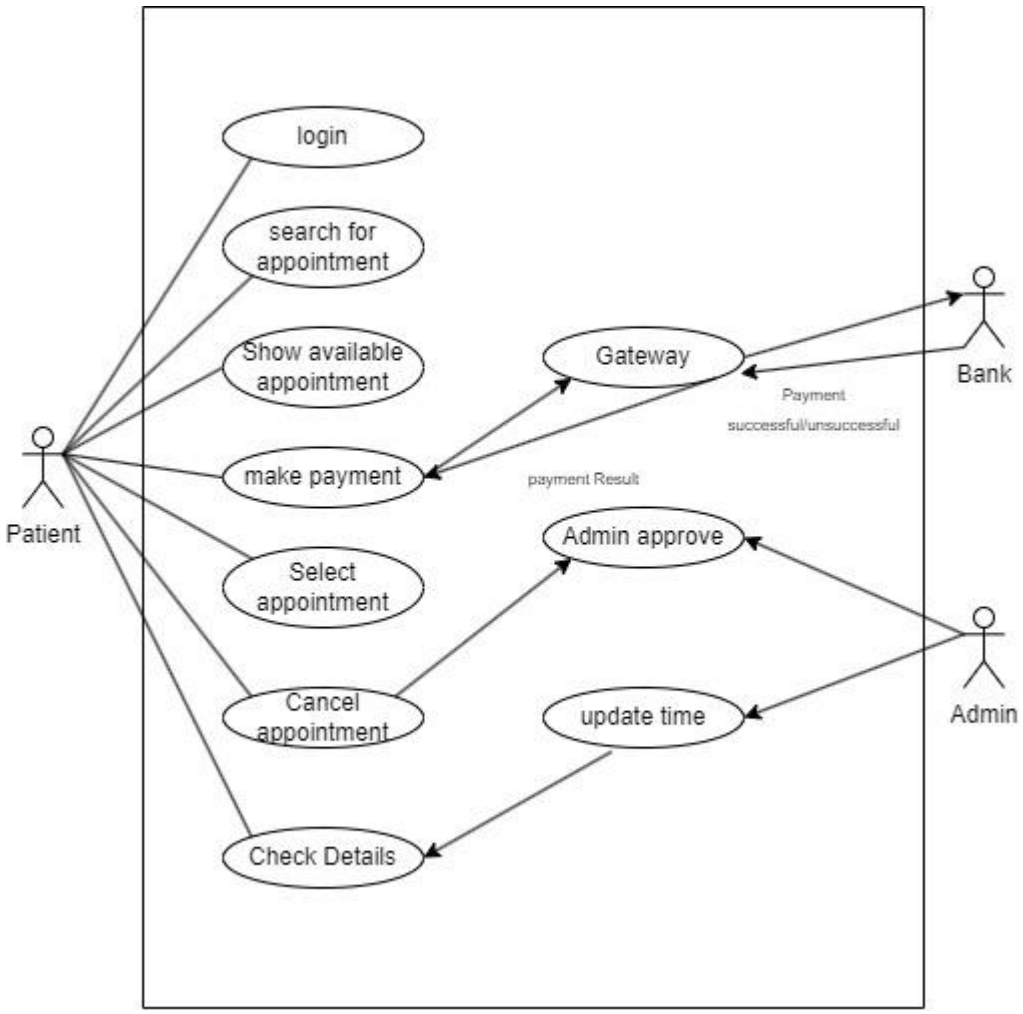
2.2.1 E-R Diagram



2.2.2 Activity Diagram



2.2.3 Use-Case Diagram



3. Social impact:

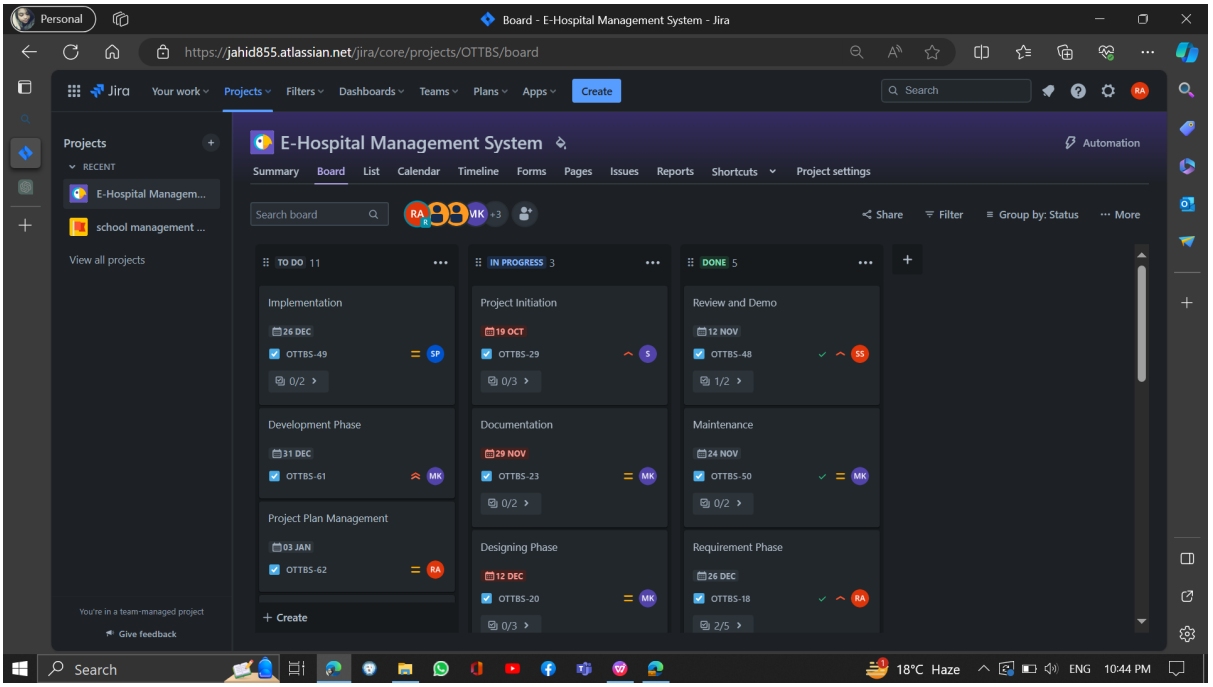
The E-Hospital Management System not only revolutionizes patient accessibility but also significantly contributes to the efficiency and collaboration within healthcare institutions. By offering remote consultations and streamlined administrative processes, it not only reduces waiting times but also enhances the overall patient experience. As a secure and eco-friendly solution, the system aligns with evolving healthcare needs, ensuring a seamless transition towards a patient-centric, technologically advanced future for healthcare. Its impact extends beyond convenience, fostering a culture of data-driven decision-making, improved resource utilization, and a more sustainable healthcare ecosystem. In essence, the E-Hospital Management System represents a pivotal advancement, shaping a healthcare landscape that prioritizes accessibility, efficiency, and collaboration for the benefit of all.

4. Development plan with Project Schedule:

The development plan for E-Hospital Management System encompasses a streamlined approach to software engineering, focusing on patient-centric features like record management, appointment scheduling, and secure data storage. Employing agile methodologies and cutting-edge technologies such as cloud infrastructure and encryption protocols, the plan ensures optimal system performance and scalability. Addressing planning concerns, task identification, and scheduling with regular communication, the project aims for efficiency and adaptability. With a strategic timeline featuring milestones for prototype development, testing, and deployment, the plan underscores its commitment to delivering a sophisticated solution that significantly enhances healthcare services in Bangladesh.

Process Model:

Our process model shows that the agile methodology fits our project's requirements well. The agile methodology helps deliver features as quickly as possible. Additionally, the development technique keeps the client informed of the project's progress. We can swiftly receive comments thanks to the constant communication between the software team and stakeholders. It helps with requirement validation, in essence. Again, the incremental process model helps to lower risk because agile development techniques encourage client involvement. This allows for a more reasonable view of the demands and the improvement's growth.


Board - E-Hospital Management System - Jira
https://jahid855.atlassian.net/jira/core/projects/OTTBS/board
E-Hospital Management System
Summary Board List Calendar Timeline Forms Pages Issues Reports Shortcuts Project settings
TO DO 11
Implementation
Development Phase
Project Plan Management
IN PROGRESS 3
Project Initiation
Documentation
Designing Phase
DONE 5
Review and Demo
Maintenance
Requirement Phase
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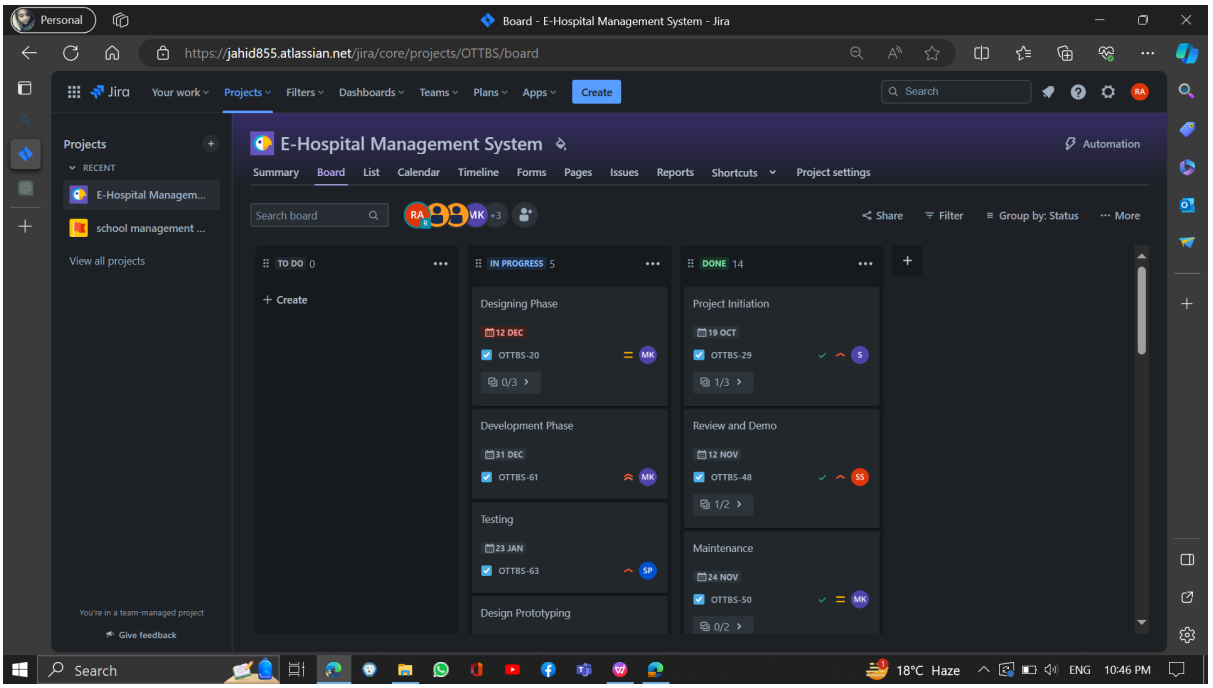
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E-Hospital Management System
Summary Board List Calendar Timeline Forms Pages Issues Reports Shortcuts Project settings
TO DO 0
IN PROGRESS 5
Designing Phase
Development Phase
Testing
Design Prototyping
DONE 14
Project Initiation
Review and Demo
Maintenance
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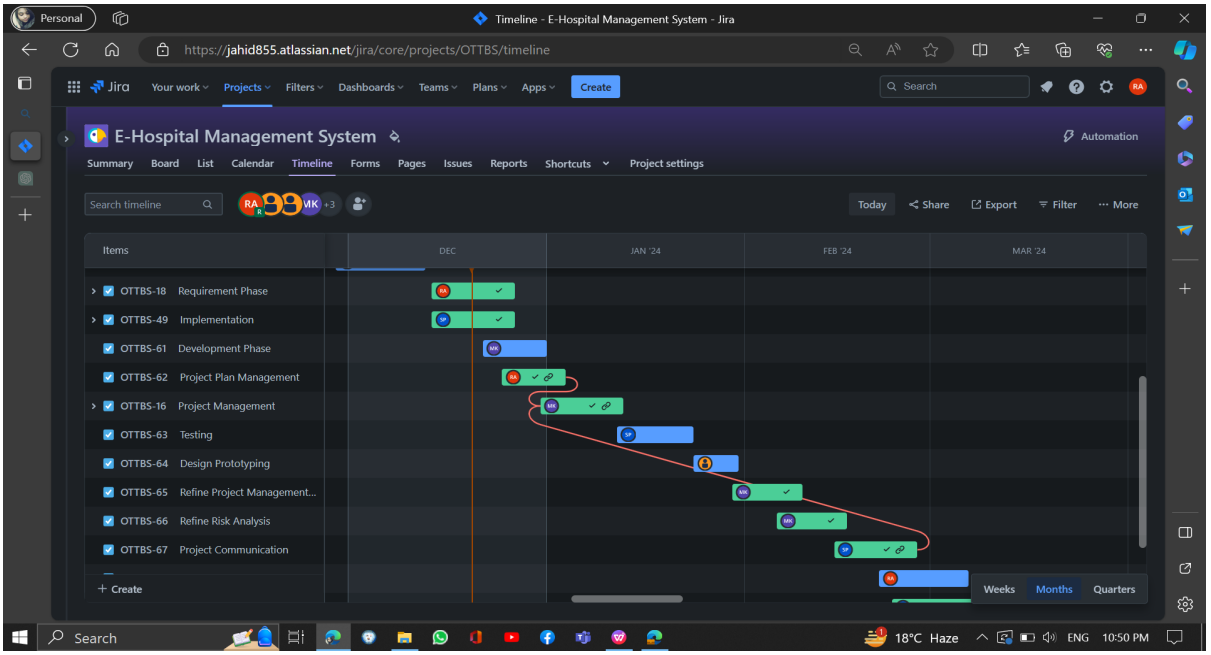
Timeline - E-Hospital Management System - Jira
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Jira
Your work
Projects
Filters
Dashboards
Teams
Plans
Apps
Create
Search
E-Hospital Management System
Automation
Summary
Board
List
Calendar
Timeline
Forms
Pages
Issues
Reports
Shortcuts
Project settings
Search timeline
Today
Share
Export
Filter
More
Items
DEC
JAN '24
FEB '24
MAR '24
OTTBS-18 Requirement Phase
OTTBS-49 Implementation
OTTBS-61 Development Phase
OTTBS-62 Project Plan Management
OTTBS-16 Project Management
OTTBS-63 Testing
OTTBS-64 Design Prototyping
OTTBS-65 Refine Project Management...
OTTBS-66 Refine Risk Analysis
OTTBS-67 Project Communication
Create
Weeks
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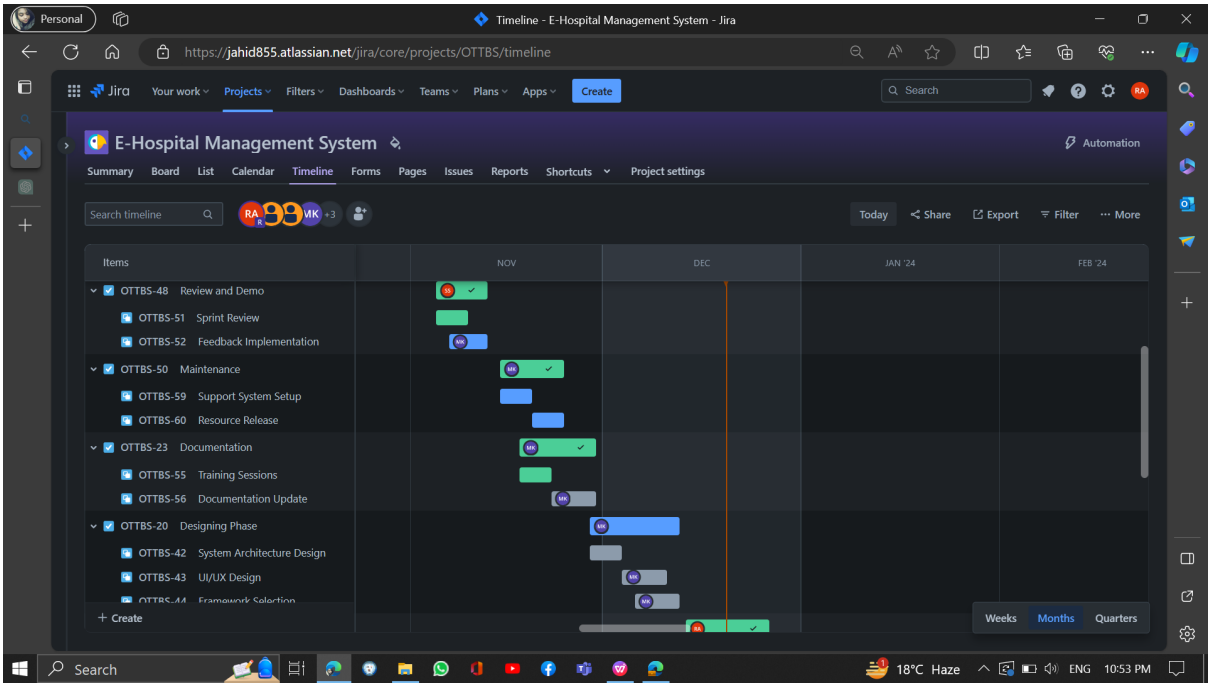

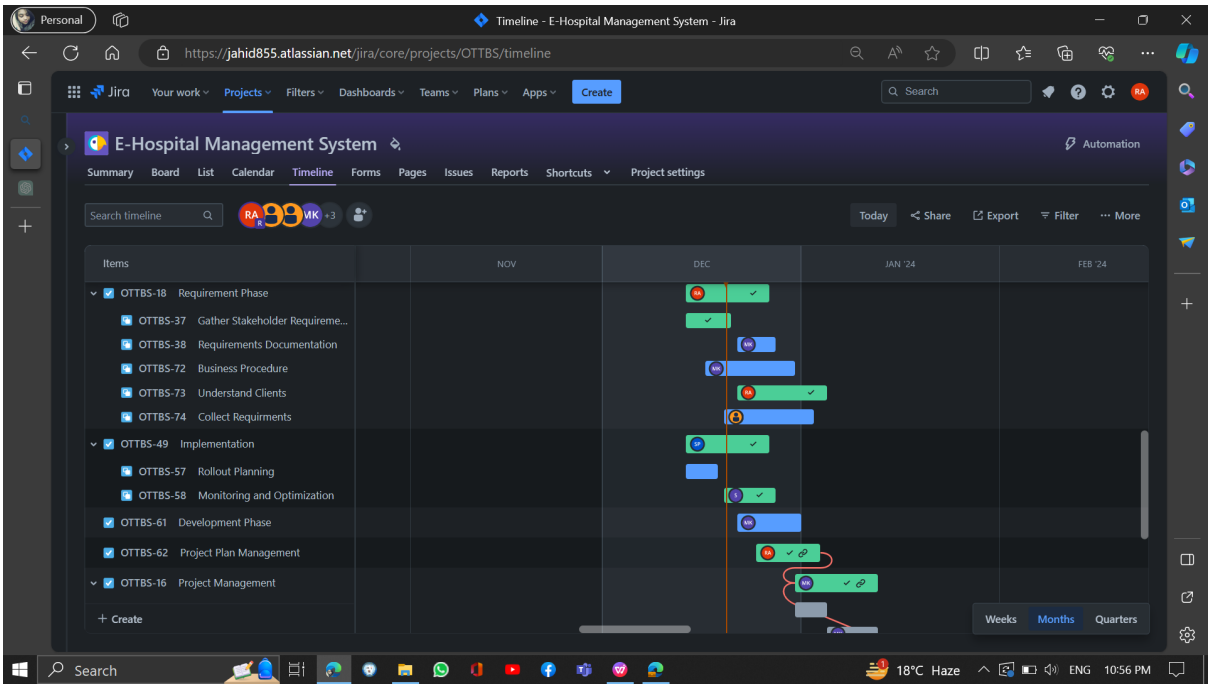

Estimation:

In our project:

EIs: ID ,Password, login, logout, registration.

EOs: User information, payment information, appointment information, timetable.

EQs: Connection to database, location.

ILFs: Payment information, bills information, conformation.

ETFs: CSS, HTML, Java, Java script.

Information domain value	Count	Average	FP
Internal logical files	3	6	18
External interface files	6	5	30
External Input	5	2	10
External Value	7	3	21
External Inquiries	6	4	24
			Total = 103

Factor Impact	(0-4)
Online data entry	2
Multiple installation	3
Distributed processing	5
Information domain values complex	1
Application design for change	2
Data communications	1
Input transaction over multiple screens	3
Master files updated online	4
Existing operating environment	2
Internal Processing complex	1
Performance critical	1
Backup and recovery	4
	Total: 29

Here,
FP=count total *[0.65+0.01*∑ (Fi)]
=103*[0.65+0.01*29]
=103*0.93
=96.82

Resource Estimation:
We will use the following resources for this project:

- Server (2,00,000)
- Computer (1,00,000)
- Internet connection & communication (80,000+ 10,000*8=160,000)
- Tools (60,000)
- Table (45,000) Chair (25,000)
- InterFood (10,000*8=80,000)
- Generator (3,00,000) Total cost is = 670,000

Time Estimation:
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)

Software Project Type	Coefficient <Effort Factor>	P	T
Organic	**2.4**	**1.05**	**0.38**
Semi-detached	**3.0**	**1.12**	**0.35**
Embedded	**3.6**	**1.20**	**0.32**

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

  =2.4*(25000/1000) ^1.05
  =70.47
- ¡ **Development time = DM = 2.50*(PM)^T**

  =2.50*(70.47) ^0.38
  = 12.59 ~ 13
- ¡ **Required number of people = ST = PM/DM**

  =70.47/12.59

  =5.59 ~ 6

5.Marketing plan:

We are going to create an automated E-hospital management system. In this system, people can use all medical facilities by using the software. . We can market it using many tools and media, like we can advertise it in social media (Facebook, Instagram, Pinterest and so on). People are mostly engaged there. We can use google ads for marketing. We can use seo marketing therefore anyone search in the google for online medical service our add and website will come to them. We can do affiliate marketing like if anyone refers through his code the person will get a coin or bonus that will help them next time with a small amount of discount in all hospital management services. We can use digital banners to attract people and make them understand how our software will help them and how they can use this app and get service. We can use newspapers and seminars to inform people about this app. Because the marketing is for the people to know about the app.

6. Cost and profit analysis

Total resource cost = 670,000

Marketing cost= 50,000
Employee's salary:

1 project manager = (25,000*10)= 250,000
4 developer = (30,000*4)*10 = 12,00,000
3 Tester = (15000*3)*10=450,000
Total salary cost : (250,000+1,200,000+450,000)=1,900,000

Total cost=(670,000 + 50,000+ 1,900,000)=26,20,000

Budget estimation: Total budget = 26,20,000 ~ 27,00,000
Profit:

Increased Sales	30%-40% (Maximum 60%)
Improve Customer Service	90%-100% (24/7)
Reduced Inventory Cost	Up to 50%

7. Reference:

1. Software Requirement Engineering Power Point slide.
2. PMTool(Jira): https://jahid855.atlassian.net/jira/core/projects/OTTBS/board?filter=%22assignee%22%20%3D%20%27641e60491273131f2ae2ce01%27&groupBy=assignee
3. Draw.io