



## Cover page

Project title: **Smart Hospital Enhancement System (SHES)** Academic Year: **2025/2026**

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Department Name: **Computer Engineering Department**

**Amer Hatem**

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Project Type **Software** or **Hardware** (Choose one)

Supervisor Name: **Dr. Muhannad Al-Jabi**

### Format:

- Single space, Times New Roman.
- 12 pt,
- Maximum 1 page.

### Abstract Body:

#### Items must be provided in the Abstract:

- Why do you think this project is important? Please explain the significance of this Project in brief.
- In your point of view what are the important aspects that should be covered in the project?
- Objective(s): In your view, please explain the main objectives of the project.
- Methodology: Give a brief outline of the application development process.
- Had this project been done before? Are there any similar applications available today?



## Project's Abstract:

### Why do you think this project is important?

Hospitals today face multiple operational inefficiencies, including **ineffective patient scheduling, poor medical inventory management, slow decision-making for approvals, and lack of structured performance evaluation for doctors**. These inefficiencies often result in long waiting times, resource shortages, and increased administrative burden on healthcare providers.

The **Smart Hospital Enhancement System (SHES)** is designed to be a **modular, standalone software solution** that integrates seamlessly with existing hospital infrastructures here in Palestine without replacing their core **Hospital Information System (HIS)**, also known as **İbn Sina**. By providing **AI-driven automation, real-time analytics, and structured workflows**, SHES significantly enhances hospital efficiency, optimizes resource utilization, and improves patient-doctor interactions.

Unlike traditional **Hospital Information Systems (HIS)**, SHES is a **plug-and-play solution** that hospitals can adopt **without disrupting their existing workflows**. It is specifically designed for **hospitals that still operate with traditional management methods**, offering them an easy transition toward digital and smart healthcare operations.

### In your point of view what are the important aspects that should be covered in the project?

The SHES system focuses on five critical areas of hospital operations:

#### 1. AI-Powered Smart Scheduling

- Ensures efficient patient-doctor assignment.
- Implements a fault tolerance system to provide alternative appointment times or available doctors within the same time-frame when conflicts arise.
- Reduces patient waiting time and prevents scheduling conflicts.

#### 2. Optimized Medical Inventory Management

- Uses **AI-driven analytics** to track inventory shortages and predict future demand.



- Generates **automated restocking recommendations** based on past usage trends and upcoming events.
- Prevents **overstocking and shortages**, reducing hospital costs.

### 3. Doctor Performance Tracking & Evaluation

- Implements a **scoring system** that tracks doctor performance based on:
  - **Patient feedback**
  - **Punctuality and efficiency**
  - **Workload distribution**
- Helps hospitals identify high-performing doctors and flag areas for improvement.

### 4. Automated Approval & Workflow Optimization

- Enables **faster approval of doctor absence requests** by routing them to higher management automatically.
- Streamlines **medical supply order approvals** with AI-generated recommendations, reducing bureaucratic delays.

### 5. Patient-Centric Features & AI-Driven Assistance

- Unlike traditional **Hospital Information Systems (HIS)**, which primarily focus on hospital staff and administrative operations, **SHES actively involves patients** in the hospital workflow.
- Provides a **personalized patient dashboard** where users can:
  - **View upcoming doctor appointments** and manage their schedules
  - **Access their medical history** within the hospital, ensuring that both patients and doctors have a complete view of past diagnoses and treatments
  - **Leave feedback** about doctors and hospital services, promoting transparency and quality improvement.
- Implements **Machine Learning-based AI** to assist patients with **preliminary symptom analysis**, helping them understand potential conditions before their consultation.



- Enhances the **doctor-patient relationship** by ensuring that medical history and feedback are **easily accessible**, improving efficiency during consultations.

### Objectives:

The primary objectives of the **Smart Hospital Enhancement System (SHES)** are:

1. **To provide hospitals with an AI-driven solution that enhances patient scheduling and reduces delays.**
2. **To optimize hospital inventory management through smart analytics, ensuring the availability of medical supplies.**
3. **To introduce a structured doctor performance evaluation system / scoring system that helps hospitals make data-driven decisions.**
4. **To automate hospital workflow processes, reducing administrative workload and improving hospital efficiency.**
5. **To actively involve patients in the hospital system by providing them with access to their scheduled visits, medical history, AI-assisted preliminary diagnosis, and feedback mechanisms.**
6. **To offer a standalone, easy-to-integrate solution that does not require hospitals to replace their existing HIS.**

### Previous work and similar applications:

- Had this project been done before?

: To the best of our knowledge and based on information provided by our supervisor, this project has not been done before. No similar projects or applications have been identified on our end at the time this abstract was written.



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- Are there any similar applications available today?

: Having contacted a computer engineer/ IT worker that has worked in multiple hospitals here in Palestine and still does, I could tell that a standalone application/website that out-layers HIS, involves patients and improves multiple scopes including the doctor-patient scheduling, IT-medical warehouse supplement planning and analyzing, and the doctors' performance is indeed not , at least not in Palestine.