

**AL-SAFWA**

**HIGH INSTITUTE OF ENGINEERING**

**Patient Management System**

**(Thoutha)**

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**2025/2026**

**ABSTRACT**

In Egypt, dental students are required to treat real patients as part of their academic projects, but finding suitable cases often proves difficult. Many students face financial and logistical challenges in locating patients with specific dental conditions, while at the same time, many patients struggle to afford high-quality dental care due to the high costs of treatment in private clinics. Currently, there is no organized or affordable system that connects both sides effectively, leading to wasted time, unnecessary expenses, and limited opportunities for hands-on learning.

The proposed project, *Thoutha*, introduces an integrated digital solution that bridges this gap by connecting dental students with patients in need of affordable treatment. The system consists of a mobile application and a website designed to facilitate this connection through a user-friendly interface. At its core, an AI-powered chatbot interacts with patients, collecting their symptoms and performing an initial examination using basic natural language processing techniques. Based on the provided information, the chatbot suggests potential dental cases and matches the patient with a student who requires a similar case for academic purposes. This ensures a smooth, automated matching process while minimizing human error and communication delays.

The development process involves the use of modern software engineering methodologies, including system analysis, database design, and user interface prototyping. The frontend will be developed using [kaza w kaza], while the backend will utilize [kaza w kaza]. Data will be securely stored in a relational database such as MySQL, and the chatbot functionality will be powered by an AI model built with Python and integrated using REST APIs. The platform will also include authentication, role-based access, and communication features between students and patients to ensure privacy and reliability.

Although the project is still under development, preliminary testing will focus on evaluating the chatbot’s accuracy in symptom interpretation and the matching system’s efficiency in connecting users. Upon completion, validation will be conducted through sample user testing among dental students and volunteer patients. The expected results include reducing the time and cost required for students to find patient cases while providing patients with access to affordable dental care. Future enhancements may include integrating professional dentist supervision and expanding the platform to support other medical fields.

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**CHAPTER (1)**

**INTRODUCTION**

* 1. **Introduction**

Dental education in Egypt places significant emphasis on practical training, requiring students to complete case-based studies on real patients as part of their academic and clinical evaluation. However, many students face considerable challenges in finding patients who match their required dental conditions. This process is often time-consuming, costly, and lacks organization. Students commonly rely on social media platforms or personal contacts to locate potential patients, which frequently leads to inconsistent results and increased financial burdens.

At the same time, a large number of patients in Egypt experience difficulty accessing affordable dental treatment due to the high costs of private clinics and the limited capacity of public healthcare institutions. This situation results in an imbalance between the needs of dental students and those of patients who require treatment but cannot afford it. Despite this clear overlap, there is currently no unified digital system designed to connect both sides effectively.

This project aims to address that issue by introducing **Thoutha**, a digital platform that connects dental students with patients in need of affordable dental care. The system utilizes artificial intelligence to assist in initial assessments and streamline the matching process between students and patients, thereby reducing costs, saving time, and enhancing learning opportunities for students while improving access to care for patients.

**1.2 Problem Statement**

Dental education in Egypt requires students to complete practical case studies on real patients as part of their academic evaluation. However, there is no centralized or standardized system to help students find these cases efficiently. As a result, students often rely on informal methods such as social media groups or personal networks, which are unreliable, time-consuming, and sometimes costly. Many students end up paying intermediaries or spending excessive time searching for patients who match the specific conditions required for their coursework.

On the other hand, a significant portion of the population struggles to access dental care due to high treatment costs in private clinics. Although public hospitals offer lower-cost services, they are frequently overcrowded and limited in available specialists. Consequently, a large number of potential patients who could benefit from student-provided treatment remain disconnected from these educational opportunities.

The current situation reveals a clear gap: dental students need patients to fulfill their academic requirements, and patients need affordable care, yet **no digital infrastructure exists to connect them efficiently, safely, and at scale**. Existing healthcare platforms in Egypt, such as appointment booking websites, are designed for licensed practitioners, not students. This lack of a structured link leads to wasted resources, slower student progress, and continued inaccessibility of affordable dental care for many patients.

*THOUTHA* aims to directly address this problem by creating an intelligent, secure platform that automates the connection between dental students and patients, eliminating intermediaries and making the process transparent and efficient

**1.3 The Proposed Solution**

The proposed system, **Thoutha**, is a web and mobile application designed to connect dental students with patients in need of affordable dental care. The system integrates an **AI-powered chatbot** capable of conducting an initial examination by analyzing the patient’s symptoms and suggesting possible dental conditions. Once the chatbot gathers sufficient information, the system automatically matches the patient with a student seeking a similar case for academic work.

The platform includes secure user authentication, a database to store patient and student profiles, and a matching algorithm that considers case type, location, and urgency. By automating the search and communication process, Thoutha eliminates the need for intermediaries, reduces time and financial costs, and increases opportunities for both learning and treatment.

**1.4 Project Outline**

This documentation is organized into several chapters, each addressing a specific aspect of the project:

* Chapter 1 provides an overview of the project, including the background, problem statement, proposed solution, and the overall structure.
* Chapter 2 presents the system analysis and design, describing use case diagrams, data flow diagrams, system architecture, and database design.
* Chapter 3 discusses the implementation phase, detailing the technologies, development tools, and AI integration.
* Chapter 4 covers testing and evaluation, explaining how the system was validated to ensure functionality and reliability.
* Chapter 5 concludes the report with results, findings, and recommendations for future enhancements.