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**COLLEGE OF INFORMATION AND COMMUNICATION TECHNOLOGY**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

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**GRADUATION THESIS**

**BACHELOR OF ENGINEERING IN**

**INFORMATION TECHNOLOGY**

**(HIGH-QUALITY PROGRAM)**

**MEDBOT: CHATBOT ABOUT**

**HEALTHCARE**

**Student: Nguyen Trung Tam**

**Student ID: B1910697**

**Class: 2019-2023 (K45)**

**Advisor: Dr. Lam Nhut Khang**

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EVALUATION OF ADVISOR

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Advisor

Lam Nhut Khang

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Sincerely,

Can Tho, 16/05/2022

Nguyen Trung Tam

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**ABSTRACT**

In recent years, the integration of artificial intelligence (AI) and natural language processing (NLP) technologies has ushered in a new era in healthcare with the emergence of medical chatbots. These intelligent conversational agents hold immense promise in transforming the way healthcare services are delivered, improving patient experiences, and optimizing healthcare workflows.

This abstract provides an overview of the evolving landscape of medical chatbots, their key functionalities, and their impact on the healthcare ecosystem. Medical chatbots are designed to engage in dynamic conversations with users, offering personalized health information, symptom assessment, medication reminders, and appointment scheduling. They empower patients with on-demand access to medical guidance, reducing the burden on healthcare professionals and enhancing overall patient engagement.

Furthermore, medical chatbots demonstrate significant potential in improving healthcare outcomes through early symptom detection and continuous monitoring. By analyzing user-provided information and historical health data, these chatbots can identify potential health risks and provide timely recommendations, ultimately contributing to preventive care.

In addition to patient-facing applications, medical chatbots are being integrated into healthcare administrative tasks, streamlining processes such as appointment booking, medical record retrieval, and insurance claims. Their ability to operate 24/7 ensures accessibility and responsiveness, alleviating the strain on healthcare call centers and reducing waiting times for patients.

However, the widespread adoption of medical chatbots does not come without challenges. Ensuring data security, privacy compliance, and maintaining a high standard of accuracy and reliability in medical advice are paramount concerns. The need for seamless integration with electronic health records (EHRs) and healthcare information systems is another technical hurdle that must be addressed.

In conclusion, medical chatbots represent a transformative technology in the healthcare domain, offering a myriad of benefits such as improved accessibility, enhanced patient engagement, and streamlined administrative processes. While challenges persist, their potential to revolutionize healthcare delivery and empower individuals to take control of their health cannot be overlooked. As research and development in AI and NLP continue to advance, the future of medical chatbots holds great promise in reshaping the landscape of healthcare for the better.

**OVERVIEW**

Medical Chatbot – a chatbox application for posting question, answer about medical health using HTML, CSS, JS, Node JS and Python, and ML

Nowadays, the necessity for health care is becoming more and more important, especially in a technology world, because of the rapid development of IT and the need for fast and accuracy information about health care. However, there are many questions and problems that traditional healthcare is limited in providing fast and accuracy information. The old manual approach needs humans to search for the info and then prepare the answer for the customers.

Chatbot medical was created to provide a useful tool to assist those who want to find and answer questions about medical health care in the most effective, fast, and convenient way. In addition, the chatbot also supports collecting and updating practical healthcare information from doctors to update the chatbot accordingly. Besides, the chatbot also allows users to search for medical information according to their desire to help them find answers quickly.

# INTRODUCTION

## Problem

Nowadays, healthcare is becoming more and more important, especially in a fast-paced technology world where everyone is so busy with their phone and digital devices. Therefore, the necessity to have a medical chatbot to help people have fast and reliable information about healthcare is considerably important. However, the development of medical chatbots has faced several challenges and problems in the healthcare industry, which modern chatbots aim to address. Here are some key problems that have spurred the development of medical chatbots:

1. Healthcare Accessibility: Many individuals face challenges in accessing healthcare services, particularly in remote or underserved areas. Medical chatbots can provide instant, round-the-clock access to basic medical information and advice, bridging the gap in healthcare accessibility.

2. Appointment Scheduling: Booking appointments with healthcare providers can be cumbersome and time-consuming. Chatbots can streamline the appointment scheduling process, making it more convenient for patients and reducing the administrative burden on healthcare facilities.

3. Information Overload: The internet is filled with vast amounts of health information, making it difficult for individuals to find reliable sources. Medical chatbots offer a trusted source of medical information, helping users sift through the noise to find accurate answers to their health-related questions.

4. Health Awareness and Education: Many people lack access to comprehensive health education. Medical chatbots can serve as educational tools, providing users with valuable information about various health topics and promoting health awareness.

While medical chatbots offer innovative solutions to these problems, it's important to recognize that they are not a replacement for professional medical care. They should complement, not substitute, the expertise of healthcare providers. Additionally, ensuring the accuracy of medical information, maintaining data privacy, and addressing ethical concerns remain ongoing challenges in the development and deployment of medical chatbots.

## History of problem-solving

Related chatbox:

Building a chatbot for student support

- The purpose of the article is to create a chatbox to support students during online learning, to automatically direct frequently asked questions that students encounter.

- The data for the training chatbox will be collected using surveys. The data processing and analysis are carried out by qualitative analysis of the responses from the surveyors

- Chatbox is built based on Design Science Research Methodology (DSRM) called UAbot. UAbot is installed using Módulo de Ambientação Online (MAO - bootcamp training module)

- Chatbox UAbot has been successful in supporting students in an online learning environment, providing quick and effective answers, and working 24/7.

Singibot - a student services chatbot

- The purpose of the article is to create a chatbox to support students of Singidunum University with a restful website platform, to automatically direct frequently asked questions that students and students encounter, and evolve and adapt. Respond to students' questions.

- Chatbox is built based on the AIML Artificial intelligence Mark-up Language (AIML) method called Alicebot.

Design and Development of CHATBOT: A Review

- The purpose of the article is to examine and evaluate techniques, technologies, terminology, and platforms for developing a chatbox.

- Provides practical aspects of chatbox applications and examples for Computer-Aided Design (CAD) applications.

## Purpose

The application "MedicalBot: Chatbot about healthcare" is used for users on the internet who have healthcare problems in particular and users across the country, in general, to search for information about healthcare and advice for avoiding health issues. Practical healthcare news, advice, and answers provide useful information to users who need fast but accurate information about health issues.

## The objectives and scope

The application provides main functions to help users find, search, and explore information related to healthcare problems and advice. This thesis will be focused on the problem of searching and providing reliable answers to the medical industry. The scope of the study is: researching the problem of searching and finding health-related information online and solving the problem by implementing a chatbot with friendly UI/UX and handy features.

## Research Methods:

- Requirements analysis: study the problem related to chatbots, especially in the medical field on the network, research papers, then analyze the function, and describe the requirements to build and train the chatbot.

- Data collection: Collect questions, answers, and relevant information about the medical problem to train the AI chatbox.

- Design: UI/UX design; Model analysis and design: PDM.

- Implementation: Using HTML, CSS, JS for UI and Python for server with MongoDB database training core chatbot with Python on Google Colab

## Result

- Using acquired knowledge of analysis, research, and information gathering, build web applications with chatbox using: HTML, JavaScript, CSS, Python, and Machine Learning

Thesis outline

**Chapter 1**: Introduction

**Chapter 2**: Background

General information about the study and main functions of the system.

**Chapter 3**: Design and implementation

Introduction of UI/UX designs, models, and implementation, describing

technologies that will be used in the study, use case diagrams, databases and

details of function in the system.

**Chapter 4**: Conclusion and future work

# PROBLEM DESCRIPTION

## Detailed description of the problem

Chatbot forum website provides users with functions such as posting questions, answers, news, searching for recruitment internship information questions, statistics of questions, and answers in an easy, fast, and easy way. effective. In addition, the chatbox feature is integrated into the website to help students get answers related to actual practice accurately and quickly.

Chatbox forum website consists of 2 main parts: the website and chatbox.

The website section helps users interact with the chatbox and supports the collection of questions and answers to improve the effectiveness of the training chatbox. In addition, the website section also supports users to find questions, answers, and news related to practical internships. In addition, users can also search for recruitment companies, and job postings as well as the requirements and skills required to prepare themselves for the skills before participating in the actual internship. The website section will also support an administrator function to post job vacancies for students and an admin function to manage questions and answers, and also help admins moderate responses.

System functions include:

1. Ask chatbox questions:

Users can interact and ask questions about issues related to actual internships so that the chatbox provides appropriate answers, respectively. Functions are available to all users

1. View questions and answers:

Users can see and view detailed questions and answers that other users or admins posted on the website

1. View recruitments

Users can see and view detail recruitments info that the recruiter or admin posted on the website

1. Post questions:

Users can post questions related to practical internships if they have not received satisfactory answers from the chatbox so that other users or admins can help provide appropriate answers. more suitable. Users must be logged in to post questions

1. Provide answers:

Users can answer questions posted on the website to help other users clarify issues that the chatbox has not fully provided. The user must be logged in to reply

1. Posting job recruitments:

Management users can post jobs related to actual internships so that other users can help know and apply for jobs.

1. Apply recruitments

Users can apply to job postings (recruitments) to know and learn the skills needed to participate in internships or participate in interviews with companies to learn more.

1. Search questions

Users can search questions by name by inputting the search keyword on the search bar to find the questions that they are interested in.

1. Filter questions by topic

Users can filter questions by specific topics that they are interested in.

1. Search recruitments

Users can also search for recruitments by name by inputting the search keyword on the search bar to find the questions that they are interested in.

1. Filter recruitments by company

Users can filter recruitment by specific companies that they are interested in.

1. Filter recruitments by skill

Users can filter recruitment by specific skills that they want to know and learn.

1. Filter recruitments by field (position)

Users can filter recruitments by specific field (position) that they want to work in this position in the future.

1. View recruitment information

Users do not need to log in to the system to still view recruitment information. Recruitment information is sorted by field.

1. Register to apply

People need to log in to the system to be able to apply for the desired job position.

1. Search recruitment information

Users do not need to log in to the system to search. The user can find search for the company, position, or salary.

1. User Management

The user has the right to manage the content that they have posted on the website such as managing questions and answers or comments.

Question Management:

Users will have the right to post, edit or delete the questions that they have posted in the system. Questions will be approved by the admin and can be seen by other users on the website

Answer Management:

Users will have the right to post, edit or delete the answers that they have posted in the system. Answers will be displayed on the detailed question page and can be seen by other users on the website. Answers will be marked correct by the admin.

Comment Management:

Users will have the right to post, edit or delete the comments that they have posted in the system. Comments will be displayed on the detail question page and can be seen by other users on the website.

1. Recruiter Management

The recruiter has the right to manage the content that they have posted on the website such as managing recruitments and applicants.

Recruitment Management:

Recruiters will have the right to view, post, edit or delete the recruitments that they have posted in the system. Recruitments will be approved by the admin and can be seen by other users on the website. Other users can also apply to the recruitment.

Applicants Management:

Recruiter will have the right to view, download or approve applicants that apply on the recruitments they have posted in the system.

1. Admin Management

The admin user has the rights to manage the content on the website such as managing questions and answers, browsing which answers are relevant, statistics questions and answers

* Question Management:

Users with admin rights will have the right to post, edit or delete the questions in the system. The latest questions will be added to the top of the news page.

* Recruitment Management:

Users with admin rights will have the right to post, edit or delete the recruitments in the system. The latest recruitments will be added to the top of the news page.

* Answer Management:

Users with admin rights will have the right to post, edit or delete the answers in the system. Admin can also approve or mark which answers are correct

* Companies Management:

Users with admin rights will have the right to post, edit or delete the companies in the system.

* Skill Management:

Users with admin rights will have the right to post, edit or delete the skills in the system.

* Field Management:

Users with admin rights will have the right to post, edit or delete the fields in the system.

* Question topic Management:

Users with admin rights will have the right to post, edit or delete the categories in the system.

* Account Management:

Accounts can only be deleted by the Administrator or the user himself, and the Administrator has the right to add, edit, and delete accounts in the system. However, Administrators cannot delete their own accounts and other Administrators.

* Statistics:

Users must log in to the system with Administrator rights to be able to statistic the number of questions, recruitments, answers, and the number of job postings in each field according to the desired time period.

## Background

### BART model

# DESIGN AND IMPLEMENT OF THE WEBSITE

## Overview

Chatbox forum is a website application that aids users in searching and finding answers to problems related to the internship. The system provides core functionalities for users: search questions (post), read questions and answers, search recruitment, apply for recruitment, and admin: manage content on the web such as company, field, skill, and accept the answer, …. It provides a chatbox feature to enable the user to ask and receive answers related to the internship, and utilities feature to boost users' engagement.

When users visit the website, they can see uploaded questions on various topics. The questions will be shown with brief detailed information to help users have an overview of what the question is about. The user has to sign up for an account to work on advanced functions. When the user is signing up, they have to provide an email address, username, and password, if the email is duplicated with other users or the password is invalid, the system will show an error notification. After signing up, the user can answer the question and apply for recruitment with detailed information.

Users can also post questions, when they post questions, they will become “Author”, and can edit their profile information to show when other users view the questions they have posted.

Users can also request recruiter rights, Recruiter will be granted full functionalities of the user and will be able to post recruitments on the website.

Admin will be granted full functionalities on the application and interact with the database.

# CONCLUSION AND FUTURE WORK

## Conclusion

Forumbot has reached the goal. We successfully created an application that provided a

chatbox that allows users to ask questions related to the internship and receive answers from it through a friendly UI/UX. Besides, the application also allows users to do other things such as: supporting users to search for questions, answers, and recruitments related to the internship that they are interested in.

Although Forumbot provides various useful functionalities, there are also some limits. At the present, Forumbot chatbox does not have high accuracy performance and does not understand other sentences that are different from the internship. The search functionality is limited, only supports search with name, but not its attributes such as content or topic of the question.

## Future work

We will integrate the apply recruitment feature into Gmail to allow the recruiter to send and receive messages to the applicants. We will add reviews and ratings for the questions as well as the recruitments to help users have the overall quality of the questions or recruitments before applying for it, and help to improve the question through the review of the users. Besides, we will enhance the search questions feature with more options such as based on categories, languages, or the programming languages of the courses. In addition, using AI to assist and recommend related questions and recruitments based on user behaviors will effectively enhance the quality of the website as well as the performance and interest of the users

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