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DEVELOPMENT OF COMMERCIAL WEB PORTAL: CHATTING ROBOT (CHATBOT) FOR XCELEARN E-LEARNING PLATFORM

MUHAMMAD HAZLAN SHAH BIN IDRIS
D20191090034

FACULTY OF ART, COMPUTING & CREATIVE INDUSTRY SULTAN IDRIS EDUCATION UNIVERSITY

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FINAL YEAR PROJECT REPORT SUBMITTED TO QUALIFY FOR BACHELOR OF SOFTWARE ENGINEERING (EDUCATIONAL SOFTWARE) WITH HONOR

FACULTY OF ART, COMPUTING & CREATIVE INDUSTRY SULTAN IDRIS EDUCATION UNIVERSITY

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Project Title:	Development Of Commercial Portal: Chatting Robot (ChatBot) For Xcelearn E-learning Platform

I confirm that all the materials contained in this final year's project report are the result of my own efforts. If the work of another person or other party, whether published or not (such as books, articles, papers, or materials of other forms such as audio and video recordings, electronic publications or the Internet) has been used, I have already recorded my appreciation for their contributions through appropriate academic conventions.I also acknowledge that the material contained in this final year's project report has not yet been published or submitted for other programs or diplomas/degrees at any university.

23/2/2023

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Supervisor's Certificate:

I acknowledge that I have read this work and in my opinion this work is sufficient in scope and quality for the purpose of awarding a Bachelor of Software Engineering (Educational Software) with Honors.

23/2/2023

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(Prof Ts. Dr Muhammad Modi Bin Lakulu)

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DEDICATION

"In the Name of Allah, the Most Merciful and Compassionate"

Special thanks to my beloved mother who is always loved and cherished,

CHE HASNAH BINTI MAT ARIF

I am deeply grateful to my mother, whose love and unwavering support have been the source of my strength and motivation.

Also, special thanks to my respected supervisor,

Prof Ts. Dr Muhammad Modi Bin Lakulu

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I would also like to express my heartfelt appreciation to my supervisor, Professor Ts. Dr. Muhammad Modi Bin Lakulu, for his invaluable guidance, mentorship, and unwavering support.

"Thank you for all the support, encouragement, and guidance that you have provided."

To my fellow comrades,

"Thank you for all the help that you have given. Only Allah SWT can repay your kindness. May you all succeed in all the fields that you venture into in the future. InshaAllah..."

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APPRECIATION

All praise be to Allah, the Lord of all the worlds. May peace and blessings be upon the noble Prophet Muhammad, his family and companions.

First and foremost, I would like to express my heartfelt appreciation to my mother and family for their unwavering support and encouragement throughout my time as a student at Sultan Idris Education University. I would also like to extend my sincere gratitude to Professor Ts. Dr. Muhammad Modi Bin Lakulu, my supervisor, for his tireless guidance, support, constructive criticism, and mentoring that have led to the successful completion of this project.

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I would also like to take this opportunity to thank the faculty members, particularly those from the Faculty of Computer Arts and Creative Industries, who have provided valuable input and feedback for the improvement of this project.

Once again, thank you very much.

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ABSTRAK

Platform e-pembelajaran Xcelearn menyediakan pelbagai maklumat tentang topik termasuk matematik, fizik, ekonomi, sejarah, dan banyak lagi. Ia diperkenalkan dan dipasarkan dengan cara menelefon pengguna secara manual dan menjadualkan pertemuan secara dalam talian dan luar talian dengan pengguna. Walau bagaimanapun, cara ini akan memberi beban kepada kakitangan dan meningkatkan kos sambil menjadikan ia lebih sukar untuk mencapai jumlah maksimum sasaran pengguna platform. Tujuan projek ini adalah untuk membantu memperkenalkan platform e-pembelajaran Xcelearn dengan membangunkan sistem chatbot yang menggunakan pembelajaran mesin iaitu Dialogflow yang khusus untuk mempromosikan dan memasarkan platform e-pembelajaran Xcelearn. Syarikat Xcelearn dan pengguna Xcelearn seperti pelajar, ibu bapa, dan guru akan terutamanya mendapat manfaat daripada khidmat pelanggan yang tersedia 24 jam. Oleh kerana chatbot adalah dinamik dan data boleh diubah, ia juga berguna untuk khidmat pelanggan perniagaan lain. Penggunaan integrasi antara rangkaian botman dan Dialogflow memberikan kelebihan kepada chatbot untuk memahami hasrat pengguna dengan lebih baik dan memberikan jawapan yang konsisten dan tepat kepada pengguna.

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DEVELOPMENT OF COMMERCIALIZE PORTAL: CHATTING ROBOT (CHATBOT) FOR XCELEARN E-LEARNING PLATFORM

ABSTRACT

The Xcelearn e-learning Platform provides a wide range of information on topics including math, physics, economics, history, and more. It was introduced and commercialized by manually calling users and setting up in-person and online meetings with users. However, doing so will burden staff and drive-up costs while making it harder to reach the platform's target user base's maximum number. The purpose of this project is to help introduce the Xcelearn e-learning platform by developing a chatbot system that utilizes machine learning like Dialogflow which is specialized to promote and commercialize the Xcelearn e-learning platform. The Xcelearn company and Xcelearn users such as learners, parents, and teachers will particularly benefit from the 24-hour availability of customer service. Since the chatbot is dynamic and the data may be changed, it is also beneficial for other commercial businesses' customer service. The uses of integration between botman framework and Dialogflow give the advantages for chatbot to understand users' intent better and give consistent and accurate answers to users.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
NLP	Natural Language Processing
NLU	Natural Language Understanding
NLG	Natural Language Generation
FAQ	Frequently Asked Question
AIML	Artificial Intelligence Markup Language
HCI	Human Computer Interface
SDLC	Software Development Life Cycle
CBM	Chatbot Module

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LIST OF ATTACHMENT

A	Software Requirements Specifications (SRS)
B	Software Design Document (SDD)
C	Software Testing Document (STD)

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CHAPTER 1

INTRODUCTION

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1.1 Introduction

In this era of digitalization, education has thrived with the passage of time and is becoming more rapid due to the existence of the Covid-19 pandemic. The education style has changed from physical class to an online class where students can learn from their home, or any environment they are comfortable in with the help of an e-learning system. OECD (in Ayu, 2020) explains that e-learning refers to the use of information and communications technology (ICT) to enhance and/or support learning in tertiary education. E-learning is one of the branches of education which is usually understood as instruction delivered with the use and help of a computer in teaching and learning processes. Xcelearn web-based learning is one of the examples of an e-learning platform. It offers a vast range of content on subjects including computing, economics, physics, history, art, and more. It is a form of personalized learning that is suitable for

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all ages. It gives students the freedom to learn at their own speed both inside and outside of the classroom by providing practice tasks, instructional videos, and a personalized learning dashboard. So this Xcelearn e-learning platform should be advertised and introduced to people since it can benefit the education system.

Promoting this e-learning platform through face-to-face meeting sure is challenging with the presence of Covid-19 since this pandemic not only changed the education style but it also restricted communication and people need to be obliged to comply with the Standard of Procedure (SOP) set to curb the spread of the covid 19 pandemic. This makes it hard for the commercialization sector to commercialize their product face to face with the customer. As a user, whether instructor, parents, or learner, of course will certainly be attracted and more interested in something that is beneficial to them. So, it is important for them to know and comprehend more deeply and in detail about the matter before they decide to join and participate with the platform. Therefore, having an assistant who can present and elaborate about the platform to their target user is crucial for this e-learning platform not just in the era of pandemic Covid-19 also in this industry 5.0 era.

One of the common and effective technologies that are used to help the process in addressing every inquiry from the target user in order to better comprehend and be interested in the e-learning platform is the chatbot system. There has been a lot of use of chatbots in various apps and software in today's period of globalisation, where technology has evolved rapidly. This similar idea served as both inspiration and a

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springboard for the development of the Chatting Robot (ChatBot) module for the Xcelearn E-learning Platform, one of the modules in the development of a commercial portal project. The ChatBot Module (CBM) was created to inform and respond to user questions about the Xcelearn e-learning platform in order to enable users to learn and know more about it.

This thesis contains six chapters. The first chapter discusses the introduction, background study, problem statement, objectives, scope and significance of the study. The second chapter is a study of surrogacy. The study will explain as well as compare previous studies related to product development and summary from the studies that have been conducted. The third chapter is the development methodology. This chapter will explain the methods that are used to develop this project which is an evolutionary prototyping model. Next is chapter four that will talk about the design. It will explain more about the designs that are conducted such as flowcharts and storyboards. The fifth chapter of this thesis will discuss the research findings where all the findings from the study will be discussed further. Lastly, chapter six is a conclusion. This chapter will conclude all the findings obtained as well as provide the importance and limitations faced throughout the study.

1.2 Background Studies

The Xcelearn e-learning Platform was introduced and commercialized by manually calling users and setting up in-person and online meetings with users. However, doing so will burden staff and drive-up costs while making it harder to reach the platform's target user base's

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maximum number. Therefore, a customer service approach that can operate around-the-clock and serve the maximum number of users is necessary to lessen the workload of staff and expenses. As a result, the system of introducing and advertising the platform using chatbots had to be established. Nagarhalli, Vaze and Rana (2020) state that Chatbot is anticipated to cut the workload at the highest management levels by up to 70%. Additionally, it can operate around-the-clock in place of customer support thus reducing costs. Therefore, it is unquestionably crucial for the Xcelearn e-learning platform to include a chatbot module to aid in introducing and promoting the platform to users.

This project can help improve quality education when people use the Xcelearn e-learning platform which can contribute to one of the Sustainable development goals (SDG) called quality education. Quality Education is SDG 4 that is focused to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. This SDG 4 aims to eliminate gender gaps in education and ensure that all individuals, including those with disabilities, indigenous peoples, and children in vulnerable situations, have equitable access to all levels of education and vocational training by 2030 which some of this align with what Xcelearn e-learning platforms offer. Thus, this project will contribute to some extent in accomplishing the SDG 4 goals

1.3 Problem Statement

Since Xcelearn is a fledgling e-learning platform, not many people know about it, especially in the post-covid 19 era. This has reduced face-to-face methods to promote the e-learning platform. Even though face-to-face communication is not possible, the e-learning platform can be introduced by connecting with users online, such as calling

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users or using software such as Google Meet, Zoom, Webex, and more to conduct meetings and provide explanations and responses to queries about the Xcelearn platform.

Nevertheless, there are several shortcomings with the following methods. One of them is that each inquiry must be answered by a human, which might be exhausting and tiring for the individual that has been assigned to answer questions from the user. This is due to the fact that the Xcelearn e-learning platform is intended for a large user base, which means that it will likely receive numerous inquiries or inquiries that are quite similar repeatedly from users. This approach is bad because it would be exhausting for staff members to respond to all of the questions that might be posed to them.

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Furthermore, as it involves human labour, human error elements will surely be involved. This can occur when those tasked with responding to inquiries about the Xcelearn e-learning platform become too tired or lose focus which causes them to pass on incorrect or inaccurate information. It is crystal clear that using the human labour to commercialize the Xcelearn e-learning platform is not the best way for it since there's too much flaws and disadvantages it cause.

In order to overcome these problems, this study proposes to develop an assistant who can respond to user inquiries promptly, precisely, and around-the-clock using a chatbot system. It can be helpful to users as well as staff members designated by the web portal admin in responding to every inquiry.

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1.4 Product Objectives

Based on the problem statement, there is no Chatbot technology used in the Xcelearn e-learning platform web portal. So, this research aims to:

a) To Identify the problem that people are unaware of the system and have no idea where to turn if they have questions.

b) To Build a prototype for the Xcelearn commercialized portal ChatBot Module based on the problem that people are unaware of the system and don't know where to turn if they have inquiries.

c) To Evaluate the function on a prototype that has been developed for the Xcelearn commercialized portal ChatBot Module.

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1.5 Product Question

1. How to ensure that the Chatbot understands human language and avoid misinterpreting queries that have been asked?
2. How to teach the Chatbot new information and ensure that the knowledge is up-to-date?
3. How to ensure that all the Xcelearn Chatbot module features are functioning well?

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1.6 Studies Scope

The study's scope was split into two parts: the scope of the module and the scope of the user. As for the module's scope, the Project concentrates on some of the crucial features that must be included in the CBM in order to assist in answering every inquiry posed by the user, as well as to lessen human work and errors in order to encourage more users to use the Xcelearn e-learning platform. One of its main features is chat with the Xcelearn chatbot function. Users can utilize this feature to talk with Xcelearn chatbots and ask queries using natural language or human language. Next, this CBM can help collect user data and register users into the Xcelearn e-learning platform. This CBM also provides the chatbot management function where all the knowledge can be altered by the admin so that the chatbot information is always up to date and it can learn new knowledge. The CBM also has features that can help improve the chatbot by saving the unanswered queries asked by the users, so that the admin can see it and update it to the chatbot knowledge. In terms of the scope of the users, the project wanted to expose the Xcelearn e-learning platform to three categories of Malaysian users: teachers, professors and lecturers, students of all ages, and parents of students.

1.7 Product Significance

It is challenging for the Xcelearn team to present this e-learning platform due to the lack of assistants that can assist with user questions, especially for new e-learning platforms like Xcelearn. It also makes it difficult for users if they have questions about this new

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e-learning platform. As a result, Users may become uninformed and disinterested in using the Xcelearn e-learning platform.

Therefore, the development of the CBM for the Xcelearn E-learning platform will make it easier for Xcelearn employees, teachers, students, and even parents to learn about the platform more thoroughly and persuade them to use it, which can assist teachers in the process of teaching and learning, assist students in studying using different techniques at their own pace, and assist parents in keeping track of how their child's learning is progressing.

1.8 Conclusion

This project primarily focuses on the construction of a robot chatting module, one of the commercial web portal's modules that attempts to advertise and draw more users to the Xcelearn e-learning platform. In short, the CBM becomes a substitute for the customer service by responding to each user's query, providing accurate information to the user, and acting as a guide for the user. It is anticipated that the development module of a commercial web portal: chatting robot (chatbot) for the Xcelearn e-learning platform will help answer user inquiries about the platform and draw people to use it.

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