UNIVERSITI TEKNOLOGI MARA

CAR MAINTENANCE MANUAL BASED ON AUGMENTED REALITY (CaMAR)

ABDUL MUIZ BIN MUSTAFFA

BACHELOR OF INFORMATION TECHNOLOGY
FACULTY SCIENCE COMPUTER AND MATHEMATICS

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ABSTRACT

Car maintenance is a crucial aspect for an automotive user as it will help to extend the lifespan of the vehicle occasionally. Besides, the use of user manual for vehicle maintenance is no longer relevant because it only limits the amount of user interactions occurs, hard to navigate, and usually printed in black and white to save cost. Therefore, this project is intended to use Augmented Reality (AR) as the cutting edge technology in developing an interactive car maintenance mobile learning. The interactive learning environment is an approach to help the users become more engaged and retain more information compared to the traditional approach, in this case, the user manual. The objectives of this project are to identify the user requirements of CaMAR AR application in enhancing user experiences and interactions mainly, to design, and to develop CaMAR AR mobile application by following the Rapid Application Development (RAD) methodology throughout the development process. Markerless detection technology that contain various advance object tracking methods becomes one of the motivations in developing this project while fulfilling the solution to the problems. This project will benefit numerous parties especially regular car users in maintaining their vehicle and the automotive industry as the added value to their product. In conclusion, CaMAR AR application may assist the car users in conducting car maintenance while enhancing the user experience through virtual environment.

Keywords: car maintenance, user manual, automotive industry, Rapid Application Development (RAD), markerless augmented reality, interactive learning

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CHAPTER 1

INTRODUCTION

Chapter Overview

This chapter clarify on research background such as the problem statement, objectives, scope and significance of the project. The background of the project will give an overview to readers on what the project is all about. In addition, the problem statement refers to the current issues identified adherence to the need of the project. Besides, the objectives of the project stated the target and outcome of the project. Last but not least, the scope is justified and the significance of the project is discussed.

1.1 Project Background

Campbell, Kelly, Jung & Lang (2017) stated that the potential values of Augmented Reality (AR) holds in different industries such as defense, automotive, robotics, and business products are undeniable. The enormous growth of AR reported by industry analysts push the ability of AR to be more powerful and have changed the way society interacts with the physical and digital worlds. AR is defined as a new technology that combines the real world with the computer-generated elements to enhance the user sense of viewing the world and perceiving the information (Agrawal, Kulkarni, Joshi & Tiku, 2015).

According to Carmigniani & Furht (2011), AR has the ability to enhance the missing senses when acquiring information, the willingness of users to read, observe, and listen to the information can be boosted just by pointing their smartphone at an image target rather than to look up the information as an instruction. One of the essential benefits of using AR is to flip the offline information to an advance instruction, manual or guidance tool. AR can reduce the minor errors or damage cost that probably occur on a first trial. AR can also turn a complex process to a more interactive way and it could make a significant