

**ENHANCING “CHOCO ORBS ” BRAND EXPERIENCE THROUGH
MOBILE PING-PONG AR GAME**



UNIVERSITI TEKNIKAL MALAYSIA MELAKA

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TIDAK TERHAD



(TANDATANGAN PELAJAR)

Alamat tetap: No 6, Jalan Impian Indah
3, Taman Impian Indah, Pontian, 82000,
Johor Darul Takzim



(TANDATANGAN PENYELIA)

En. Mohd Khalid Bin Mokhtar
(Nama Penyelia)

Tarikh: 12/9/2023

Tarikh: 25/9/2023

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ENHANCING “CHOCO ORBS” BRAND EXPERIENCE THROUGH MOBILE
PING-PONG AR GAME

FATIN AQILAH BINTI MOHAMAD ROSLAN



This report is submitted in partial fulfillment of the requirements for the
Bachelor of Information Technology (Game Technology) with Honours.

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

2023

DECLARATION

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PING-PONG AR GAME**

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STUDENT

:


(FATIN AQILAH BINTI MOHAMAD ROSLAN)

Date : 12/9/2023



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I hereby declare that I have read this project report and found
this project report is sufficient in term of the scope and quality for the award of
Bachelor of Information Technology (Game Technology) with Honours.

SUPERVISOR

:


(EN. MOHD KHALID BIN MOKHTAR)

Date : 25/9/2023

DEDICATION

First and foremost, I would like to express my heartfelt gratitude to my beloved parents. Your unwavering support, understanding, and moral guidance have been the driving force behind my success in completing this mobile ping-pong AR game project. Your constant motivation and encouragement have inspired me to push my boundaries and fulfill my goals. I am truly grateful for your love and belief in me.

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First and foremost, I would like to extend my deepest gratitude to my supervisor, En. Mohd Khalid Bin Mokhtar, for his guidance, mentorship, and unwavering support throughout this journey. His expertise, constructive feedback, and insightful suggestions have been instrumental in shaping the content and direction of this report. I am truly grateful for his dedication and commitment to my academic and personal growth.

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ABSTRACT

This project aims to investigate the potential of enhancing the brand experience by integrating Augmented Reality (AR) into mobile games, with a specific focus on developing a ping-pong game that incorporates AR technology. The problem identified in the industry is: first, many companies struggle to create captivating and memorable marketing experiences that leave a lasting impression on their clients. Second, the failure to leverage emerging technologies, such as mobile AR, puts these companies at risk of falling behind their competitors. Additionally, the lack of comprehensive evaluation frustrates their ability to gauge the impact of mobile AR games on brand experience. To overcome the said challenges, this study proposes the development of a mobile AR ping-pong game as an innovative solution. Creating an engaging and immersive AR experience within the game aims to provide a unique and memorable brand interaction for users. The objectives of this project include studying brand experience and exploring ways to utilize it in mobile AR gameplay, developing a mobile AR ping-pong game that enhances the brand experience, and evaluating the effectiveness of the game in improving the brand experience. By conducting comprehensive evaluations and assessments, this project seeks to provide insights into the usability of mobile AR games on brand experience, ultimately helping companies create engaging and memorable marketing experiences. In conclusion, based on the project's results, 46.7% of respondents rated the game as 'Excellent,' 31.1% as 'Good,' 2.2% as 'Okay,' and 20% as 'Poor.' These findings provide valuable insights into AR integration in mobile games for brand enhancement, offering practical guidance to companies seeking a competitive edge through emerging technology.

ABSTRAK

Projek ini bertujuan untuk menyiasat potensi meningkatkan pengalaman jenama dengan menyepadukan Augmented Reality (AR) ke dalam permainan mudah alih, dengan tumpuan khusus untuk membangunkan permainan ping-pong yang menggabungkan teknologi AR. Masalah yang dikenal pasti dalam industri ialah: pertama, banyak syarikat bergelut untuk mencipta pengalaman pemasaran yang menarik dan tidak dapat dilupakan yang meninggalkan kesan yang berkekalan kepada pelanggan mereka. Kedua, kegagalan untuk memanfaatkan teknologi baru muncul, seperti AR mudah alih, meletakkan syarikat ini pada risiko ketinggalan di belakang pesaing mereka. Selain itu, kekurangan penilaian menyeluruh mengecewakan keupayaan mereka untuk mengukur kesan permainan AR mudah alih terhadap pengalaman jenama. Untuk mengatasi cabaran tersebut, kajian ini mencadangkan pembangunan permainan ping-pong AR mudah alih sebagai penyelesaian yang inovatif. Mencipta pengalaman AR yang menarik dan menyeronokkan dalam permainan bertujuan untuk menyediakan interaksi jenama yang unik dan tidak dapat dilupakan untuk pengguna. Objektif projek ini termasuk mengkaji pengalaman jenama dan meneroka cara untuk menggunakannya dalam permainan AR mudah alih, membangunkan permainan ping-pong AR mudah alih yang meningkatkan pengalaman jenama dan menilai keberkesanan permainan dalam meningkatkan pengalaman jenama. Dengan menjalankan penilaian yang menyeluruh dan komprehensif, projek ini berusaha untuk memberikan cerapan tentang kebolegunaan permainan AR mudah alih pada pengalaman jenama, akhirnya membantu syarikat mencipta pengalaman pemasaran yang menarik dan tidak dapat dilupakan. Kesimpulannya, berdasarkan hasil projek, 46.7% responden menilai permainan itu sebagai 'Cemerlang,' 31.1% sebagai 'Baik', 2.2% sebagai 'Diterima' dan 20% sebagai 'Lemah.' Penemuan ini memberikan cerapan berharga tentang integrasi AR dalam permainan mudah alih untuk peningkatan jenama, menawarkan panduan praktikal kepada syarikat yang mencari kelebihan daya saing melalui teknologi baru.

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LIST OF ABBREVIATIONS

FYP	-	Final Year Project
AR	-	Augmented Reality
GDLC	-	Game Development Life Cycle
AI	-	Artificial Intelligence



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CHAPTER 1: INTRODUCTION

1.1 Project Background

This augmented reality (AR) ping-pong game provides a unique experience by combining the popular genres of sport and action within an augmented reality (AR) environment. The issue, however, lies in the fact that many businesses struggle to develop engaging marketing experiences that leave a lasting impression on consumers. To address this problem, the game incorporates augmented reality technology to enhance the brand's marketing efforts and provide an interactive and attractive platform for engaging with customers. By leveraging the gamification elements and AR features, the aim is to create a unique and unforgettable marketing experience that captivates the target audience and fosters a deeper connection with the brand. A strong brand can develop into a community, and including game elements in it can give that community a forum for communication (Blippar, 2023).

The game targets a wide range of ages, including children, teenagers, and young adults aged 5 to 25. This age range ensures that players of all ages and interests can participate in the game and have a good time, regardless of their skill level. The incorporation of sports, action, and augmented reality in our game creates a captivating and dynamic environment. Using mobile devices or AR-enabled equipment, players may experience the thrill of ping-pong directly in their own residence. The game utilizes technology to merge the virtual and real worlds, bring closer the distinction between the virtual and the real.

1.2 Problem Statement

In today's competitive market, many companies struggle to create captivating and memorable marketing experiences that leave a lasting impression on their clients. This inability to engage effectively with their target audience limits their ability to establish strong brand relationships, enhance customer engagement, and foster long-term loyalty. Additionally, failing to leverage emerging technologies, such as mobile Augmented Reality (AR), puts these companies at risk of falling behind their competitors. The lack of comprehensive evaluation frustrates their ability to gauge the impact of mobile AR games on brand experience and inhibits the development of optimized approaches to foster customer engagement and loyalty. Without overcoming these problems, companies may miss out on valuable opportunities to differentiate themselves in the market and maximize their potential for success. (Mathioudaki, 2022).

1.3 Objectives

The project objectives are:

- i. To study brand experience and how to utilize it in mobile AR gameplay.
- ii. To develop a mobile AR ping-pong game that will enhance the brand experience.
- iii. To evaluate the usability of a mobile AR game in improving the brand experience.

1.4 Goals and Genre

The game's main objectives are entertainment and brand engagement. The purpose of entertainment is to provide gamers with a fun and fascinating experience. The project aims to provide an entertaining, exciting, and intriguing experience by immersing people in a dynamic augmented reality (AR) ping-pong world. AR gamification marketing applies these qualities to non-gaming contexts to draw in, engage, and keep customers. It combines games and gaming elements with augmented reality (Blippar, 2023).

Simultaneously, the game is designed to enhance brand engagement. The purpose is to design a game that effectively communicates the brand's values, establishes a connection with the target audience, and strengthens the entire brand-consumer relationship through an innovative combination of gamification features and brand content. The game plans to improve brand awareness, boost customer engagement, and promote a sense of loyalty among players by providing an immersive and entertaining gameplay experience.

In terms of genre, the game is classified as sports and action. Players can feel the excitement and excitement of traditional sports gaming while simultaneously engaging in fast-paced action sequences within the AR world by integrating aspects from different genres. This genre selection provides an immersive and exhilarating experience, allowing players to enjoy the competitive atmosphere and dynamic gameplay associated with sports and action-oriented games.

1.5 Game Features

The game's target audience includes people of range ages from 15 to 25, including teenagers and young adults. The game is designed for a diverse group of players who have an interest in casual gameplay experiences. While most casual games appeal to non-gamers or those looking for more relaxed and accessible gaming experiences, our game seeks to create an entertaining and engaging experience for players of all ages and interests. The game assures that teenagers and young adults of various skill levels and prior gaming experience can all participate and have a good time by providing easy-to-learn gameplay principles and an engaging AR ping-pong environment.

Instead of following typical game rules, players compete in ping-pong matches against AI opponents, attempting to surpass them. In terms of progression and content unlocking, the game utilizes a system based on real-world products. Based on items they purchase; players can unlock different ball skins. For example, if a cereal brand has three different box designs, players must purchase all three box designs in order to unlock the corresponding ball skins in the game. This strategy encourages gamers to interact with the brand's products while giving an exclusive and personalized gaming experience.

1.6 Conclusion

The outcomes of the project include an AR ping-pong game that assures to improve the brand experience for youths and young people. Increased engagement, stronger brand awareness, increased consumer loyalty, and a better understanding of the company's message and values are all the expected results. The game is expected to produce good word-of-mouth marketing and social media buzz, while also creating a unique and memorable experience that sets the business apart from competitors.

The report's next chapter will provide insight into the Literature Review and Research Methodology. It will include a review of existing literature on augmented reality, gamification, and brand experience, as well as an outline of the study methodology used. This chapter presents the basis for understanding the project's conceptual basis and research methodologies.



CHAPTER 2: LITERATURE REVIEW AND PROJECT METHODOLOGY

2.1 Introduction

Chapter 2 literature review gives an extensive overview of existing research and studies on augmented reality, gamification, and brand experience. It explores a variety of sources to get a good understanding of the basic theory and essential concepts relevant to the project. This review is going to influence the study technique and provide useful insights into how augmented reality and gamification may be used to improve brand experiences.

2.2 Genre

The game is related to the sports and action genres. It merges features from both genres to produce a unique and intriguing gameplay experience. The sport of ping-pong is the primary focus, with customers using virtual paddles to strike a ball back and forth across a virtual table. This feature is the core gameplay mechanic and relates to the sports genre. The game also includes action components to increase the excitement and intensity of the gaming. Fast-paced gameplay and exciting environments are proof of this. These action-oriented elements attempt to enhance the entire game experience by adding an extra layer of excitement and difficulty.

In regard to subgenres, the game falls under the category of augmented reality (AR) games because it uses AR technology to integrate the virtual ping-pong gameplay with the real-world surroundings. The integration of AR technology boosts player immersion and engagement, establishing it as a separate subgenre within the larger sports and action genres. In essence, the game's genre is a mix of sports and action, with an augmented reality (AR) gaming subgenre. This collaboration results in an

exclusive and immersive experience that combines the physical sport of ping-pong with dynamic action components and the incorporation of AR technology.

2.3 Existing Games

There have been other similar games produced in the domain of augmented reality (AR) sports games, such as "AR Tennis" and "AR Basketball." AR technology is implemented in these games to create interactive and immersive sports experiences on mobile devices or AR-enabled equipment. However, by focusing especially on the sport of ping-pong, our game, the AR ping-pong game, offers an original approach.

While compared to other AR sports games, our game stand out due to its emphasis on ping-pong gameplay elements like as paddle control, ball physics, and table dynamics. The game's goal is to give a realistic and engaging ping-pong experience by utilising augmented reality technology to generate a virtual table and paddles in the player's real-world environment. This concentration on a single sport distinguishes our game from the broader genre of AR sports games.

In terms of technology, the game uses augmented reality (AR) to project virtual things over the real-world surroundings. The hardware capabilities of mobile devices or AR-enabled equipment, which follow the player's movements and adjust the virtual table and paddles accordingly, offer this immersive experience.

In terms of software development, the game makes use of well-known AR development frameworks such as Vuforia and Git for Android. Image detection, tracking, and interactivity are just a few of the tools and features provided by these frameworks. Furthermore, the game is created with industry-standard game creation tools such as Unity and programming languages such as C#. These tools allow for the quick and efficient development of games, as well as the seamless integration of AR features and gameplay dynamics.

We did research on current research and case studies relating to AR gaming, gamification, and brand experiences to acquire insights and inform our approach. We looked at beforehand study findings, references, and other relevant