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The Process of Creating Mobile Game: Sarawak Cultural Heritage

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Abstract— **Sarawak's cultural heritage still appears to have a minimal level of awareness among citizens, including among Malaysians themselves, particularly those in western Malaysia. Only several people recognize Sarawak's uniqueness and also what makes it different from other countries around the globe. There are more than 27 diverse ethnic groups in Sarawak, totaling over 2.6 million people. The project aims to develop a mobile game featuring Sarawak's cultural heritage, which include traditional clothes, cuisine, plants and animals, musical equipment, and weapons. It is assumed that this game would contribute to expand recognition and attention towards how astounding Sarawak and its heritage are indeed. The smartphone game is being used in an educational way and seeks to encourage learning through fun, visualization, classical music, and knowledge provided by this platform. This alone would make learning more effective and convenient. On the other hand, this analysis will be carried out through the quantitative approach, in which surveys and questionnaires would be circulated both on paper and online. In conclusion, this project has become a great success and has fulfilled the goals and objectives set since the initiation of the project.**

Keyword: Sarawak; Malaysia; heritage; cultural; identity; mobile; game, learning

I. INTRODUCTION

Embracing Malaysia means to love Malaysia, a vibrant and thriving society where ethnic groups, Malaysians, Malay, Indians, Chinese and many other ethnicities are unified in peace and equality. This combines multiple non-adjoining parts of the country: Semenanjung Malaysia, which is also known as Western Malaysia; and Sarawak and Sabah, which are located in the north of Equator (East Malaysia).

Malaysia's largest region, Sarawak, is made up of 27 ethnic communities, nearly identical in size to the peninsula of Malaysia. Every ethnic community has its own distinctive tales, ideologies, cultures and traditions. As according to Operational Research International Conference (2013), the highest number of these communities is the Iban community, whom comprise 31% of the population, accompanied by Chinese (28%), Malay (20%), Bidayuh (8%), Melanau (6%), Orang Ulu (5%), Indian, Eurasian and smaller native communities, with a record of 2% [1]. It is located northwest of island of Borneo and is bordered by the province of Sabah in the north east of Malaysia, Borneo in the south of Indonesia and Brunei in the north.

It also is known as the 'Land of the Hornbills,' since most species of hornbills can indeed be discovered here. The birds represent the Spirit of God as a significant spiritual symbol for the people of Dayak. Sarawak is a beautiful land of nature, 70% full of rainforest, with high peaks, vast cave systems and an excellent degree of biodiversity.

A. Problem statement

Sarawak's heritage is missing its presence in such a community that is shifting towards modernization. Modernization, defined as a transformation from a traditional to a modern era, has indeed been documented to have a profound influence on culture. Besides that, it offers a way of transformation wherein traditional ethnicities will have to adapt themselves culturally, politically, and socially to the demands of today's society.

The next problem is the lack of awareness or insufficient knowledge on the Sarawak culture. Numerous people all over the world, including Malaysians themselves, particularly from the peninsula, know very little about Sarawak, its people, and the heritage of Sarawak. This is associated with a lack of education and understanding. Sarawak has been a jewel in the rough, as not many vacationers have been to this part of Malaysia. Besides that, there is little to no emphasis on tourism in Sarawak.

Finally, society continues to idolize Western qualities rather than its own culture. Modern civilization may be positive, yet on the other hand it brings our country further adverse consequences than positivity. As stated by Dr. Ismail Thamby [2], Young people have the tendency of doing something different until they consider the implications that could emerge. The media have a big obligation here, as most young people cultivate bad habits from dramas, music videos and movies. Our people have been subjected to the heavy influences of Western culture, such as our actions, design, language, attitude, and mentality.

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B. Research question

- What is the most suitable platform to carry out this project?

- What are the heritages of Sarawak?

- How can mobile games help to increase exposure of Sarawak?

C. Objective of Study

This project is designed to develop a 2D game which will capitalize on Sarawak's rich cultural heritage in the eastern part of Malaysia. The objectives are stated as below:

- To develop a mobile game that will cover about the heritage of Sarawak.

- To raise awareness of how uniquely beautiful Sarawak and its heritage is.

- To evaluate the effectiveness of the game.

D. Significance of study

All results of this research would serve to the betterment of people, ensuring as preserving our heritage alive holds a hugely important role in the 21st century. Culture and heritage must be preserved as it portrays and communicates the identity of a nation and a society. The identity of a country is typically reflected in its cultural arts heritage, that includes the practices and lifestyles of the various nations of the country, such as clothes, food, rituals, sculpture, and many more. In fact, this project should help to raise recognition and provide knowledge upon this splendid heritage of Sarawak. Culture is a symbol of the history of a nation. The uniqueness of our culture is reflected by our traditional cultural heritage. Ethnic traditional wear, for instance, consists of various forms and techniques of costumes and decorative apparel.

II. LITERATURE REVIEW

A. History of Sarawak

According to research conducted on the official portal of Government of Sarawak [3], prehistoric records suggest that ancient humans have lived in Sarawak for as long as 40,000 years, 30,000 decades longer than on the Malay Peninsula. The Chinese began arriving in the 7th century, along with several other East traders, as well as in the 11th century, when several Indonesian parties took possession of Sarawak.

Most of the current aboriginal communities originated from Kalimantan, including the Iban people, who migrated here towards to the end of the 15th century and now make up about 33% of the state's population. Sarawak was in possession of the Sultanate of Brunei from the 15th to the beginning of the 19th century. It was a distinct political region only until Sir James Brooke, the first of the three so-called White Raja, arrived. Brooke had effectively crushed the rebellion, and by way of apology the Sultan of Brunei had proclaimed him King of Sarawak in 1842. James Brooke died in 1868 and then was succeeded by Charles Brooke, his nephew which lasts till his death in 1917 [4].

B. Origin name of Sarawak

Through the research which have been undertaken, there has been a long debate about how the name actually comes into existence. It seems there is no conclusion as to how the state received its name, while, despite several speculations, it was named after the Sarawak River [5]. However, below are several other variants in the origin of the word 'Sarawak':

- The name of a mineral.
- The name of a pineapple.
- The phrase "Serah kepada Awak" or also means surrender to you in English.

C. Definition of Heritage

Our culture is our heritage. Every country each had their own history and culture, which distinguishes them from all other societies [6]. Heritage is the whole continuum of practices, signifiers, structural elements, and origins that we have acquired.

As Yahya Ahmad [7] stated, tangible heritage encompasses constructions, architectural landmarks, memorials and surroundings that serve as a tangible icon of our history and heritage. It often entails objects formed or collected by people and organizations. These pieces, that also make up a vital area of the nation 's past as well as culture and heritage, include antiquities, pieces of art, documentaries, portraiture, movies as well as other essentials of substantial historic value.

Intangible cultural heritage, on the contrary, includes the beliefs and practices, practices, phrases, knowledge that individuals recognize as part of the culture, F. Lenzerini [8] explained. These different kinds of heritage are typically handed down from one generation to the next. Intangible cultural heritage will continue to form over time, such as our cultures verbal dialects, and would be consistently transformed by cultural groups in response to changes in their environment.

D. Heritage and People of Sarawak

Fig. 2: People of Sarawak

Sarawak is widely known for its native communities, other than being known primarily because of its forest area. Those who end up making Sarawak among the most fascinating areas to visit in Malaysia, compensating for more than half of the overall population and hence this huge array of cultural groups.

- Iban, Sarawak's main population

The Ibans form Sarawak's largest proportion (nearly 34%) of the demographic. Generally considered a really formidable head-hunters on the island of Borneo, todays modern Ibans are pleasant, welcoming, and polite people.

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- Bidayuh

The Bidayuhs, personality trait of the native Sarawak tribal groups, are recognized for everyone's kindness and thus are regarded as the greatest makers of Rice Wine or tuak. Bidayuhs often use distilling techniques to distil "arak tonok," a type of moonshine.

- Kayan

There are about 15,000 Kayans in Sarawak. At the northern boundary of Sarawak, halfway from the Baram Dam, the topmost Rejang River as well as the lower Tuba   . The Kayan people built their longhouses, because they were actually the original hunters.

- Kenyah

There are around 22,000 Kenyah communities in total, most of whom live in Upper Belaga and Upper Baram. There is really no precise documentation about the unique origins of this culture.

E. Methods on Heritage Preservation

UNESCO is a body of the United Nations that supports international collaboration across education, science and technology. This is also an association that retains the world 's heritage by facilitating access, knowledge as well as other services [9]. UNESCO has three kinds of heritage: Cultural heritage. (tangible, intangible, movable, immovable. Underwater heritage)
- Natural heritage (natural sites with cultural aspects).
- Heritage in the event of armed conflict.

F. Introduction to Mobile Game

The advancement of digital games has become an industry of unwavering success for more than 10 years now. Games are becoming an important portion of the overall app, with a growing number of mobile platforms, along with their functionality. At almost the same time, two technologies were announced around 2008. Lance Talbert mentioned that the iOS and Google Play Store had already opened a new phase of mobile gaming. [10].

Smartphone games are games designed for mobile gadgets such as laptops, mobile phones, and portable devices. As Anindya Ghose [11] stated, cellphones today, particularly smartphones, offer a wide range of networking services, such as broadband, Ethernet, Wi-Fi and 4G which allows people to play the games in multiplayer modes where two or more players can interact with each other.

G. Game Based Learning (GBL) and Gamification

Fig. 4: Reasons to try GBL (John Spencer,2018)

Game Based Learning (GBL) encompasses the use of video games to promote teaching and learning says Matthew Gaydos [12]. In 2018, Stamatios Papadakis [13] stated that it includes utilization of the various games explicitly programmed to accomplish goals and objectives (educational games) including 'mainstream games'—i.e. games created for entertainment yet also utilized to achieve educational objectives.

Given the significance of gaming used for teaching and learning, some didactic hypotheses have also suggested the theory of gamification. The systematic and in-depth utilization of game theory to overcome problems and encourage learning by having all the right game elements [14]. The main idea is by using gaming and game-design approaches to optimize non-game conditions [15] to maximize the learner's motivation and dedication.

H. Case Study

1) Real Find Object

Fig. 5: Real Find Object

Real Find Object is a form of puzzle game which allows the user to search and tries to find hidden objects, the style often known as Doodle Discover. The quest is simple: the players have to locate the hidden object on the screen, given the name of the object. After playing a few matches, players will find hidden objects simple and easy, and then they will enhance their concentration a lot.

2) Search and find objects : Monsters.

Fig. 6: Search and find Objects. Monsters

"*Monsters: search and find hidden objects*" is an entertainment game for small kids. They're looking to find lovely characters hidden for the shortest period of time. It will begin as just an easy game firstly, because there will be

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relatively low challenges and monsters on screen, however the difficulty will intensify by each level and also the characters will multiply! The shorter the time taken, the higher the point total players can get.

3) Little Objects Finder Game

Fig. 7: Little Objects Finder Game

This is an object hunting game. Players are going to look for beautiful tiny items in a larger picture that is really made up of these smaller objects. Users could even play with friends or on their own and have fun. It's so entertaining and interesting. As an educational game, children will also have a great time building on improving their intellect, response time and concentration.

4) Comparison Table

The table below shows the comparison between the 3 case studies previously reported. It can be indicated that the *"Real Find Object"* game is really the game that would be the most equivalent towards this project.

TABLE 1: Game comparison table

Game	UI Design	Theme	Player	Level of Difficulty	Strategy
Little Objects Finder	Object clutter in a big shape	Big pictures random objects	Single or with family	Frequently added	Big pictures contain a lot of little objects
Search and Find Objects : Monsters	Fun music and effects	Colorful and cute Monsters	Single	Easy, Medium, Hard	Search for monsters that will be more and more on screen.
Real Find Object	Forest	Small random objects	Single	Easy, Medium, Hard	Play a cool and relaxed match with time countdown

It could be inferred that, fundamentally, this chapter outlines out all guides which could be used to better clarify the study and that they might contribute in the development stage of this project. The case study and the comparisons table help to ensure that the project and the prior project, that were done by other developers, have their own value and are not essentially the same.

III. METHODOLOGY

This chapter includes an overview of the methodological approach used. It comprises the descriptions of the procedure used in carrying out this work, and also the reasoning for the use of the method. The chapter further discusses the various stage of the research, including demographics, the category of respondent, the methodology and the research model. The quantitative method has been used in the research.

A. Demography

This section analyses the unique demographic elements of the respondents. Statistics would be obtained from students at the University of Kuala Lumpur, Malaysian Institute of Information Technology (UNIKL MIIT). The prototype has been tested by 10 respondents and the age range of the respondents are from 18 to 24 years old.

B. Type of Respondent

UniKL MIIT is one of the 13 institutes offering a number of degrees, diplomas, undergraduate and postgraduate courses. MIIT students that were currently undergoing their diploma and bachelor's degree were the target group of respondents since they fall under the targeted age range.

C. ADDIE Model

The Software Design Life Cycle (SDLC) model used in this study is the ADDIE model, a standard model frequently used for creative development project.
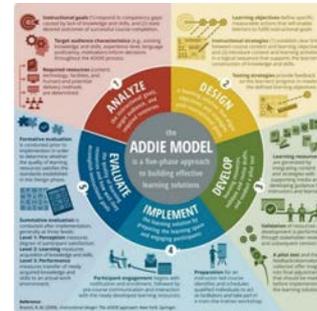

Fig. 8: Diagram if ADDIE Model

IV. PROTOTYPE DESIGN DEVELOPMENT

A. Introduction

In this segment, all designs and development processes are gathered, reported and discussed in a precise form.

B. Media Specifications

Throughout the development of this game, media plays a major role. It will be at the root of delivering the goal of the game by providing it to the audience by meticulous deliberation and preparation of suitable media such as audio, interface design and color schemes that will be used.

1) Theme and Mood

The theme and mood are known to be the main concept or the true values of a project which can be clarified directly or indirectly. The idea used for this game was the theme of the woods and the forests to give the scenery and surroundings that fit the old-Sarawak location.

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2) User Interface Design (UI)

Fig. 9: Main Menu/Home Screen

Here is the design for the main menu of the game. This scene will be shown after the video introductory scene is played. There are 7 interactive buttons on the home screen, which are "Play," "Dialect," "Heritage," "Quit," settings, the character of Libau, which is the man carrying "Terabai" and the "Sarawak Heritage" which is the logo of the game.

3) Logo Design

Fig. 10: The game's logo

The Hornbill is the iconic symbol of Sarawak and is in the logo of the game. This logo was designed in yellow, red, orange, brown, black and grey colors. This corresponds with both the theme of the wilderness, the forest and also reveals the old surroundings of Sarawak, when the majority of the elderly still remain in the jungle until modernization.

4) Characters Design

Fig. 11: Characters wearing their traditional clothing and modern clothing

Figure 11 above is the final design of the four main characters that will be on the heritage scene in the game. Each one comprises four different ethnic groups in Sarawak among many others. From left to right are Jaing who comes from the Bidayuh, Bulan who is a Kenyah, Jabu from the Iban tribe and Unyang from a Kayan community. They wear their corresponding traditional clothes and carry their ethnic heritage objects. The four designs to the right are the same characters but are wearing modern fashion clothing.

5) Audio (Sound and Music)

Sound could be one component that works to optimize and build an entirely interactive experience. The developer made a huge effort to specify the superb soundtracks that could depict the theme and atmosphere of Sarawak. All of the audio in the game is downloaded from either YouTube or free sources. The developer approached the composer of each audio and obtained permission to use non-free music or sound effects in order to prevent copyright strikes.

V. TESTING AND EVALUATION

This chapter discusses the findings of data collection and analysis implemented to evaluate the effectiveness of the mobile game. The approach used to gather data in this project was quantitative research, where data and results would be obtained via questionnaires. There were 21 questions to be answered by originally 10 target audiences. However, a record of 17 respondents aged 18 to 24 have installed and reviewed the game. The questionnaires were then distributed to each one of them and thus the results are presented and covered in this chapter.

A. Testing

In order to help developer to identify the effectiveness, ability to functions and the quality of the developed systems, the testing process is considered as one of the mandatory steps to be taken. The testing process is also done in order to ensure that every applied system in the product will be able to achieve the specifications to be used by the users. The testing is conducted during the development process within the developer of the project does not require to be completed. This process was done as a procedure to make sure all the system in the application or product is fully functioning. Throughout the testing phase, the alpha and beta phase are used.

1) Alpha Testing

Alpha testing is undertaken to detect all possible pitfalls and glitches well before final prototype is released to the target audience. The alpha testing of this project was carried out by madam Wan Shazlina, lecturer at the University of Kuala Lumpur, Malaysian Institute of Information Technology, and also the developer's supervisor herself, whom is also one of the lecturers at the university, madam Jessifa Joanna binti Mohd Supian. The testing has been carried out through the Microsoft Teams software on 2 June 2020

2) Beta Testing

Beta Testing is conducted by "actual users" of the mobile game in a "real world" and could be referred to as a form of external acceptance testing. The Beta version of the mobile game was released to 15 target audiences to review the prototype in attempts to get opinions on the interactivity, the design of the user interface as well as the deliverables. Comments and feedbacks from the target customer are the primary concern to optimize the mobile game as well as to debug whatever errors found.

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B. Data collection and results

The following represents the pie chart showing the outcomes of the questionnaire, which comprises as many as 21 questions pertaining to the research in hand. Once the developer had held a meeting with the supervisor, both decided to select 10 target audiences for beta testing, and as many as 17 responses were obtained as the questionnaire was distributed after the test was carried out. This is indeed a positive development since it would be capable of making data collection and results to be stronger. The questionnaire is divided into parts which includes Part A for biodata and basic knowledge, Part B for user interface and navigation design and Part C for Content of the mobile game.

9) Have you recently seen any advertisements about Sarawak? If yes, please describe through which media? Otherwise, leave this section empty.

6 responses

Magazines
Visit sarawak
Tv, instagram
In twitter
Television
Through Youtube ads

Fig. 13: Question 9

The result obtained in Figure 13 proves the problem statement that was mentioned earlier, which was the lack of exposure or the lack of information on the Sarawak culture. Among the 17 respondents, only 6 provided answers to this question, stating that they have recently seen ads on multiple platforms. This means the other 11 people had not.

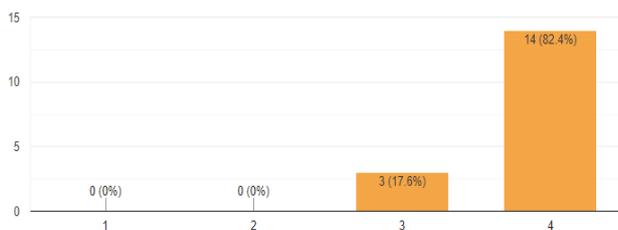18) I have learned new things about Sarawak through this game.

17 responses

Fig. 14: Question 18

The question in the above figure is very relevant since it responds towards this project's objective and problem statement. It can be seen, according to the above graph, that most respondents strongly agreed that throughout the game they had learned and gained a great deal of information and understanding. The game has successfully achieved its goal of providing audiences with awareness of Sarawak 's heritage. 82.4% strongly agreed, and that is equivalent to 14 respondents, while the remaining 3 respondents agreed evenly.

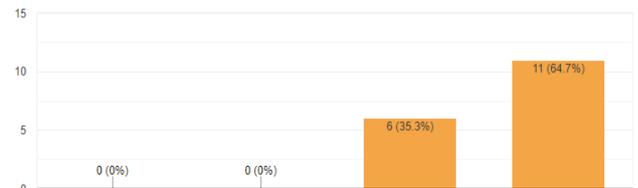20) The game has effectively displayed the heritage of Sarawak.

17 responses

Fig. 15: Question 20

It is really vital for the developer to get this feedback from the target audience since the question above fulfils the data analysis of this project. Above question shows a statement as to whether Sarawak's heritage has indeed been efficiently and effectively presented in this mobile game. A total of 11 respondents, making up 64.7% of the total responses received, answered that they strongly agreed of the above-mentioned statement. Another 6 which answered "Agree" are the 35.3% remaining. The developer may draw the conclusion that this project, through this method of data collection, is a clear success. This question is indeed a confirmation through the design of the object in this game, the heritages all of which were aimed to be featured in this game.

VI. CONCLUSION AND RECOMMENDATION

This chapter discusses the relevant and underlying findings presented in the previous chapters. The conclusion allows the developer to emphasize the main points of the study. This conclusion summarizes the thesis as a whole, drawing inferences from the entire phase as to what was discovered or determined as well as the implications of those observations and conclusions. This chapter is also where the developer will tie together all threads of the data or information that were gained through the methodology and attach them to the initial purpose of writing the thesis.

A. Suggestions for Future Improvement

The developer has received a range of suggestions that will be considered and acknowledged as a consideration for potential game improvement. One of the suggestions was to add a skip button to the introduction animation that will be played for around 45 seconds right after the user clicks on the game icon. That being said, the reason that the developer intended not to put any options to skip is that because it is strongly recommended that every audience go through the whole scene in the game in order to completely grasp the content and the message that the game should be able to deliver.

B. Limitations

The first limitations to be addressed are the type of game selected by the developer for the prototype. There are several other types of games that can deliver more enjoyment and engage more with the audience. However, the concept of the hidden object was selected by the developer to be in the game.

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Apart from that, there are more than 36 ethnic groups in Sarawak, but again the developer has specified only 4 of the ethnic groups that are Iban, Kenyah, Kayan and Bidayuh. The developer then designs the heritage of each ethnic group that could be categorized as traditional clothing, accessories, musical instruments, and weapons.

The prototype can only be installed on the Android operating system (OS). And hence, any audience who uses other OS is unable to install and test the game. Other developers could overcome this limitation by setting up a separate platform prototype that could be installed not only on Android and Apple OS, as well as on Windows OS.

C. Conclusion And Recommendation

As a firm conclusion, the developer would like to clarify that now the objective of this game has been successfully achieved. The results of the study should contribute to the benefit of society, given that maintaining our heritage alive plays a vital role in the 21st century. Culture and heritage should be preserved as it reflects and represents the identity of a nation and a society. In contrast, this project effectively intends to provide the community with knowledge and information on Sarawak 's beautiful heritage.

The project could help bring Sarawak and its heritage to the eyes of many Malaysian citizens and potentially outsiders. It will also deliver educational benefits via a modern, in-depth mobile game which has proved to be more efficient than the regular method of learning environment. The game will also be developed by using Unity Real-Time Development Platform and Adobe software. In reality, through such a game, the targeted audience is more likely to embrace their culture and heritage after increasing exposure and understanding.

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