Fortune Run: A Mobile Game Showcasing Cultural Celebration in Malaysia

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Abstract. Mobile games have become one of the most popular entertainment medium nowadays. Mobile games with wide variety of genres can be found and downloaded easily through digital marketplace such as Google Play and Apps Store. Elements of cultural festival has also been developed as mobile games. However, the amount of existing mobile games that contain Malaysia’s local cultural content are limited. Malaysia is a unique country consists of multiple ethnics and cultures. Therefore, a game has been developed in this project to introduce the unique elements of Malaysia’s culture to the user. The game is created based on the theme of Chinese New Year celebration in Malaysia. Game Development Life Cycle (GDLC) was used as a methodology.

The game is implemented in mobile platform and in English language. The game uses a 2D side scrolling design approach where swiping method is used to control the game character. Technology Acceptance Model (TAM) is adapted to measure user acceptance level in terms of game design, functionality and overall game performance. Results of user acceptance test shows that 50 % of respondents agreed that the developed mobile game able to provide general idea of how Chinese New Year is celebrated in Malaysia.

1. Introduction

Mobile game is a video game played on mobile devices such as featured phone, smartphone and tablet computer [1]. However, game features designed for mobile devices are not as rich as Personal Computers (PCs) or consoles platform because mobile devices have limited system resources [1]. Various game approaches have been applied in mobile games development. One of the most popular game approaches is 2-dimensional (2D) side scrolling where user can move the character from one side of the screen to the other through side camera view. Although games are created with the goal to provide entertainment, it has implicitly encourage its players to learn [2]. Nowadays, learning about cultural heritage [3] and festivals has also been made available through mobile games. Nevertheless, only a few of these mobile games contain Malaysia’s local content.

Malaysia is a multicultural country with many unique elements. Festivals celebration is one of the unique elements that unite all races in Malaysia. In Malaysia, Chinese New Year is not only celebrated by...
Chinese, but also celebrated by other races together. This unique element of Malaysia maybe known by majority of the Malaysians, but there is still a possibility of some Malaysians or even foreigners have no knowledge about it. Among the downloadable 2D side scrolling mobile games, only few of them contain Malaysia’s local cultural content. Therefore, Fortune Run mobile game features Malaysia’s local content that can provide some general ideas about what Malaysia looks like. Moreover, the theme of Chinese New Year celebration should be able to introduce the environment of Chinese New Year festival in Malaysia to the user.

The rest of the paper is presented as follows: related work discusses about mobile game development and comparison of existing games with similar game approach. Next, the methodology describes the mobile development process, followed by the section that discusses the results. Finally, the concluding remarks are presented.

2. Related Work

Chinese New Year, or also known as ‘Spring Festival’ is an important festival celebrated by the Chinese all around the world. The first day of the Chinese New Year falls on the first day of the first month in Chinese calendar and the celebration last for 15 days. Each year of the Chinese calendar is named after one of the 12 animals of the Chinese Zodiac [4]. In Malaysia, Chinese New Year is not only celebrated by the Chinese but also celebrated together by other races. During the festival, people of other races will visit and greet their Chinese friends or neighbours.

Three 2D side scrolling mobile games which are similar are analysed in Table 1. The developed application is named as (c) Fortune Run, is compared with 2 other existing applications, which are (a) Chhota Bheem Jungle Run [5] and (b) Nasi Lemak Delivery [6]. From the table, we can identify that Fortune Run contains more game features compared with the other two similar mobile games. The features in Fortune Run mobile games consist of boosters, virtual game shop, four levels with different game environments and three character lives. Besides that, Fortune Run uses swiping control method where player can control the character by swiping up or down on the mobile screen. Most importantly, Fortune Run features the combination of Chinese New Year theme and Malaysia’s local content.

| Function                  | Chhota Bheem Jungle Run | Nasi Lemak Delivery | Fortune Run       |
|---------------------------|-------------------------|---------------------|------------------|
| Goals                     | Control the character to travel as far as possible, collect coins and avoid obstacles. | Control the character to deliver Nasi Lemak, collect coins and energy, and avoid obstacles. | Control the character to collect red envelopes, complete in-game objective and avoid obstacles. |
| Malaysia’s Local Content  | Not available           | Kampung scene       | Chinese New Year celebration |
| Boosters                  | Available               | Not available       | Available         |
| Virtual game shop         | Available               | Not available       | Available         |
| Game level                | One level               | Ni ne levels        | Four levels       |
| Game environment          | Jungle                  | Village             | Village, city, residential area and in-house |
| Number of character lives | One                     | One                 | Three             |
3 Methodology

Fortune Run game application is developed in Android based operating system using GDLC methodology [7]. There are six phases involved in the development of Fortune Run game: initiation, pre-production, production, testing, beta and release. Details of each phase will be discussed in the following topic.

3.1 Initiation

In the initiation phase, a rough concept of what kind of game that will be created is first identified. The output of initiation is the game concept and a simple game description. Game description for the Fortune Run game can be referred to in Table 1.

3.2 Pre-production

Pre-production involves the creation of game prototype. The prototype functions to assess the game design and the whole idea. Game design focuses on defining game genre, gameplay, mechanics, storyline, characters, challenges, fun factors, technical aspects, and storyboard. Fortune Run is created as a single player offline mode. The setting of the game depicts the celebration of Chinese New Year in four different game environments in Malaysia. The game uses graphics created in 2D. Fortune Run was developed as an action game as it contains series of actions such as jumping and running. The game also requires fast responses from the user to control the game character. 2D side scrolling approach was implemented in this game development. In addition, the game uses swiping control method for character controlling where player can control the character by swiping up and down on the mobile screen. Fortune Run consists of four game levels; each with its own environment and associated obstacles. The game environments can be referred to in Table 1. The list of obstacles includes chicken and rock (village), traffic cone and road sign (city), cat and water splash (residential area) and beverage cans and mandarin peel (in-house). In the game, the player needs to collect as many red packets as they can and in doing so need to avoid the obstacles. Once the player has collected the required amount of red packets, they will unlock and proceed to the next level. The game finishes in the fourth level with the setting of firecrackers.

3.3 Production

Production is the main process which involves the assets creation, source codes creation, and the integration of both elements. The output of this phase is a formal and refined prototype. The game consists of eight scenes which are main menu, level selection menu, tutorial, game shop and game levels 1 until 4. Each scene contains game assets that are related to the theme of Chinese New Year. Figure 1 shows a few scenes from the Fortune Run game. The game assets created in this phase included graphical arts and game audio. The graphical arts developed in this project include game character, game environments, obstacles, collectables and buttons. All of the graphical arts were developed using Adobe Flash CS6. The graphical arts was painted using colours that match the theme of Chinese New Year. After the game assets were created, they were imported into Unity. The graphical assets were dragged into the scene and scaled to suitable size using the scaling tool in Unity. Then, the graphical assets were arranged and aligned in appropriate position according to the storyboard. Figure 2 shows the assets arrangement of main menu using Unity.

Integration between game assets and scripts is a process of attaching the script files to the game assets through game engine. In this project, Unity was used to integrate the game elements together. Scripting in Unity is implemented using C# script language to execute series of actions or commands. In the game, different scripts were created to execute commands such as to control character, generate game props and calculate score. After the scripts were created, they were then attached to the corresponding object in Unity. Figure 3 shows the attachment of script to the game character. Figure 4 shows the partial code
in character control script that used to control the character movements by swiping up and down on the screen.

Figure 1. Fortune Run game: (a) game shop, (b) level selection menu, (c) level 3 game environment

Figure 2. Graphical Assets Arrangement of Main Menu using Unity

Figure 3. Character Control Script Attached to Game Character
3.4 Testing phase
Testing phase is the phase where alpha testing was conducted to test the game functionality and playability. A formal details testing plan were created for the purpose. Testing are conducted using features playtest to assess the game functionality and playability. Functionality involves testing whether the game assets such as main character, boosters and buttons functions correctly. Game playability involves testing the ease and correctness of swiping method used to control the main character and navigate through the game environment. Any bugs, loopholes, or dead-ends discovered during playtesting are documented in the testing plan and fixed.

3.5 Beta phase
Beta phase is where the beta test of a game is conducted. Beta testing still using the same testing methods as the previous testing method. The purposes of beta testing are to find any bugs remained in the game and collect satisfaction feedback from the testers. In this project, Technology Acceptance Model (TAM) [8] is adopted to measure user acceptance level in terms of game design, functionality and overall game performance. Therefore, a closed beta test was conducted among 20 selected target users. The testers were required to provide feedback about the game by answering a questionnaire. Questionnaires that consist of evaluation on user acceptance, functionality and design of the mobile game were created and distributed to the testers.

3.6 Release
Release phase is the time when the game build has reached final stage and ready to be released to public. However, Fortune Run game application is released internally within the organization for educational purpose.

Figure 4. Partial Code Used to Control Game Character.

Game building is the last step of production. Firstly, the publish platform was set to Android and all the game scenes were loaded into the build list. Then, platform settings such as resolution, orientation, game icon and title were set. Finally, the game installer with Android Package Kit (APK) format was created.
4. Results and Discussion

User testing was carried out to evaluate three variables based on TAM users’ acceptance level towards the game design, functionality and overall game performance. 20 respondents of the age of 16-23 were involved in the testing. Table 2 shows the construct and measured items adopted from TAM to evaluate the game quality.

Table 2. Technology Acceptance Model for evaluating game quality

| Construct                  | Evaluation variables | Measured item                                                                                                                                 |
|----------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Perceived of usefulness   | Game design          | PU1: I found that the game gives general idea of Chinese New Year celebration in Malaysia.                                                 |
| (PU)                      |                      | PU2: I found that the game design matches the theme of Chinese New Year celebration in Malaysia.                                             |
|                            |                      | PU3: I found that the colours used matches the theme of Chinese New Year celebration in Malaysia.                                           |
|                            |                      | PU4: I found that the graphical arts used matches the theme of Chinese New Year celebration in Malaysia.                                    |
| Attribute of usability    | Functionality and    | AU1: The main character is easy to control.                                                                                                 |
| (AU)                      | playability          | AU2: The movement of main character is smooth.                                                                                               |
|                            |                      | AU3: The game has a smooth navigation.                                                                                                       |
| User satisfaction (US)    | Overall performance  | US1: The game is fun to play with.                                                                                                           |
|                            |                      | US2: The game is easy to be understood.                                                                                                      |
|                            |                      | US3: The game runs smoothly on Android device.                                                                                                |
|                            |                      | US4: The buttons functions correctly                                                                                                         |
|                            |                      | US5: The game instruction are clear.                                                                                                          |

Figure 5 shows that more than 50% of the respondents agreed and the rest strongly agreed that the game design provides general idea of how Chinese New Year is celebrated in Malaysia. Similarly more than 80% of the respondents strongly agreed that the game design and the use of colours and graphical arts are suitable for the theme of Chinese New Year celebration. From the game environment, respondents were able to identify and associate graphical assets used with the festival celebration.

Figure 5. Game design
Results of user acceptance test on functionality (Figure 6) shows that 65% of respondents agreed that the game character is easy to be controlled. However, 15% of the respondents have neutral opinion on the difficulty of character control. This is probably due to unfamiliarity of the swiping method used in the game, as compared to the normally used tapping method. Nevertheless, more than 60% of respondents agreed that both character movement and game navigation is smooth. Meanwhile Figure 7 shows the results of the game’s overall performance whereby more than 40% of respondents strongly agreed that the game is fun to be played and can be easily understood. Moreover, the respondents were satisfied with the game as it runs smoothly on the device, have fully functional buttons and clear game instruction.

5. Conclusion and Future Works

Fortune Run mobile game has been successfully developed to showcase the celebration of Chinese New Year in Malaysia. Compared to other locally theme games, Fortune Run captures the spirit and environment of the occasion by incorporating important elements such as red packets, mandarin and fire crackers in the game. As the game was developed as an offline single player mode, future works would include adding online scoreboard so that user can compete with other players in real time.
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