Educational Tycoon Game and Cultural Heritage

Developing PAANTU BANG: Pasar Hantu Bangka

Almeera Amsana Rachmani
Department of Electronics Engineering
University of Bangka Belitung
Bangka, Indonesia
almeera_ar@ubb.ac.id

Razen Syahputra
Department of Information Technology
University of Bangka Belitung
Bangka, Indonesia
razensyahputra0@gmail.com

Okki Darmawan
Department of Information Technology
University of Bangka Belitung
Bangka, Indonesia
okkithehacker@gmail.com

Hastina Prayuda Wardani
Department of Electrical/Electronics
Engineering
University of Bangka Belitung
Bangka, Indonesia
hastina_pw@ubb.ac.id

Goldy Amsana Rachmanio
Department of Electrical/Electronics
Engineering
University of Bangka Belitung
Bangka, Indonesia
goldy_ar@ubb.ac.id

Umar Faruq Vista
Department of Information Technology
University of Bangka Belitung
Bangka, Indonesia
umar.vista@ubb.ac.id

Abstract— **With the rapid development of technology and digital information, video games have become a significant cultural phenomenon, with a rapidly growing number of players each year. Concerns regarding the impact of video games on mental health have been largely dismissed by recent studies, suggesting minimal negative effects and emphasizing the motivational aspects of gaming. Recognizing the potential of video games as educational tools, this study explores the development of "PAANTU BANG: Pasar Hantu Bangka," a cultural tycoon game created by VAR Production, a team from the Bangka Belitung Islands. Utilizing the prototyping method for software development, the game combines business management principles with local cultural heritage. Through stages of requirement gathering, design, prototype building, evaluation, and revision, the game was successfully developed and published. The game offers players practical insights into running a business, including resource management and financial planning, while also educating them about regional folklore and traditional dishes. The result is a unique educational tool that effectively integrates entertainment with learning, promoting both business acumen and cultural awareness.**

Keywords—Bangka cultural heritage, Bangka folklore, business management, educational tool, tycoon game

I. INTRODUCTION

With the pace of development of technology and digital information, video games have become one of the hot topics to talk about. Every year the number of video game players increases rapidly. Which in this case will certainly raise concerns about the impact between the mental health of players who play video games for a certain period of time.

However, this concern is dismissed based on [1]. They explained that there was little or no evidence of a causal relationship between players and well-being. The motivation of each player to play video games plays a role in well-being and they emphasized that the effect of the average gaming time on each player's mental health is very small.

So, from this point of view, video games should not provide anxiety about the impact of mental health. Video games should be used as a learning medium. Video games that provide a curious sensation certainly make players feel challenged and make them want to know about the details of the game. There are a lot of game genres that can be used as a learning medium [2], [3], [4], [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16], [17], one of which is the tycoon game genre. The tycoon genre in a video game teach players numerous valuable lessons. Such as aspects that are very important in building, organizing, and participating in running the business. Not only that, the tycoon game genre is expected to be able to increase the number of existing young entrepreneurs.

Another important education to be included in the game is the element of cultural heritage. It can be concluded that the meaning of cultural heritage in [18] is a general term that refers to tangible and intangible aspects of society and culture that are valued. The importance of this element is included in education so that the existing culture is not lost to the times. And also, so that the next generation knows the variety of cultures that exist in every part of the world.

Realizing the potential in the game industry and also to overcome the aforementioned existing problems that can be directed into educational value, the authors that consists a group of students and a professor who acts as an advisor from the province of the Bangka Belitung Islands, Indonesia, formed a team named VAR Production to took the initiative to create a game that can combine cultural and tycoon aspects.

The authors decided to make a game called PAANTU BANG: Pasar Hantu Bangka which has the logo design based on its acronym and full title made in Canva as shown in Figure 1. PAANTU BANG is a cultural tycoon genre game, which gives players the sensation of making a fish noodle business. By inserting the educational side about business, and adding characters that come from the legends of the local community, as well as fish noodle products derived from regional specialties, the PAANTU BANG game is expected to be successful in providing education regarding business management and Bangka cultural heritage which is Bangka folklore to players who play this game.

Figure 1. PAANTU BANG: Pasar Hantu Bangka Logo
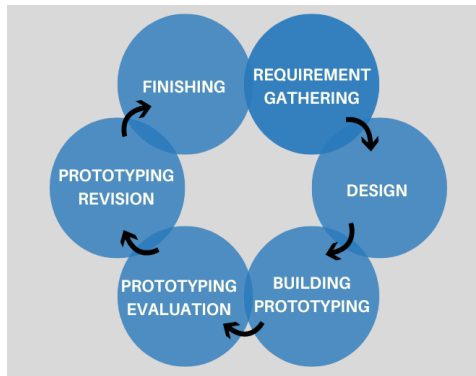
II. METHODOLOGY

Figure 2. Software Development

This game development uses the prototype development method (Figure 2). The prototyping method is used to see the initial game design so that it can shorten the time to design assets and feedback from the game [19], [20], [21]. The stages were started from gathering requirements, design, building prototypes, evaluating prototypes, revising prototypes and ended by finishing phase.

1. Requirement Gathering

At this stage, a search will be made for the needs or plans in making software, for example software prototyping. In addition, this stage will plan initial ideas for development, such as the theme and story to be taken, the initial appearance for players, and game mechanics.

The development of the PAANTU BANG game began with a team discussion to identify the main problems to be solved and to determine the basic concept of the game. After exploring various ideas, the team agreed to develop a game with a cultural tycoon genre that highlights the uniqueness of Bangka culture. The selection of this genre aims to present a game experience that is not only entertaining, but also educational, introducing the local culture through interactive game mechanics. After the basic concept is determined, the next step is to design the game mechanics by systematically determining the game flow according to the theme. The team discusses how the player will interact with the elements in the game, how the game will progress, and what the main challenges and goals for the player will be. Each aspect of this mechanism is designed with a balance between the fun of the game and the educational value to be conveyed. To support the development of the game, the team then creates a list of required assets. This list includes various visual and audio elements that will be used in the game, such as main and supporting characters, interactive objects, backgrounds, navigation buttons, background music, sound effects, and fonts that match the game's theme. In addition, a detailed list of UI/UX elements is created, including the layout structure, user interface appearance, and menu order in the game to make navigation more intuitive and convenient for players.

2. Design

In the design stage, the game development begins by first designing the UI/UX design through Canva to create visual elements such as buttons, backgrounds, and text shapes that have been customized and then applied to the Godot Engine. The game interface was designed to be attractive and functional, guaranteeing an intuitive user experience. The design of the ghost characters in the game was inspired by local ghosts from Bangka, which were made more adorable and as unique as possible through sketches and illustrations in ibisPaint. In addition to the characters, various supporting elements such as bowls, chopsticks, noodles and toppings are designed to harmonize with the theme of the game. To enhance the game experience, copyright-free background music (BGM) and sound effects (SFX) were searched on YouTube and taken from the links provided by the uploaders. These sound files were integrated into the game by using AudioStreamPlayer in Godot and set via GDScript scripts to play at specific moments. Once all the assets were ready, the files were saved in the assets folder in the Godot project for processing and use in the game. The next step was to incorporate the assets into the game system. Once the UI/UX assets from Canva were completed, they were imported into the Godot software in order. The characters created in ibisPaint were integrated into the game through AnimatedSprite, allowing for smooth and dynamic movement in the animations. In addition, various additional assets were also included as interactive objects. The next step was to set up the audio system in the game. BGM from YouTube was integrated using AudioStreamPlayer, while object interaction effects were set up through GDScript scripts according to the game state.

3. Building Prototypes

The initial prototyping process in this game development begins with importing assets into the project's assets folder in the Godot engine. Next, these assets were placed in the game using the appropriate nodes, which served as containers for the objects to be displayed. The initial development process involved the random generation of ghost characters. Each ghost has a specific path, but in the initial implementation, because multiple ghosts shared the same node, only one ghost could move. To work around this, a script was implemented that duplicated nodes when ghosts were generated and deleted them when they reached their destination. While this solution worked, a new problem arose regarding the queuing system, where collisions between ghosts would cause the entire queue to stall instead of just the ghost at the back. Through reading the documentation and a lot of trial and error, a new mechanism was implemented that allowed only the back ghosts to stop when they collided. Another challenge was when ghosts aborted transactions, leaving them idle. This was solved by adding a status variable that determines whether the ghosts are in the queue or not. Once this movement system was working properly, development moved on to implementing the text board and food purchase mechanism. This process was simplified by replacing the provided text in the appropriate node and setting it to appear or disappear at the appropriate time using a timer. Similarly, the food serving mechanism was completed by setting a timer for its duration, ensuring that each element in the prototype worked as expected.

4. Evaluating Prototypes

In the evaluation phase, the prototype was tested by all team members on laptops with different Windows operating systems (Windows 10 and Windows 11) to ensure the game functions as designed and identify potential bugs. Any bugs found were documented and reported to the programmers to be fixed in the revision phase. After the fixes were completed, the game was retested to ensure that the issues had been resolved without causing new obstacles. This testing also aims to assess performance and comfort of play, ensuring the game runs smoothly without lag or technical glitches. Through a continuous improvement process, the PAANTU BANG prototype can develop into a more stable version that is ready to be played by users.

5. Revising Prototypes

The programmers make revisions by fixing bugs found during the evaluation to ensure that any technical issues can be resolved to make the game run more smoothly. Once the fixes are complete, the game is retested to ensure that the problems have been solved without introducing new obstacles. This testing is also designed to assess performance and comfort, ensuring that the game runs smoothly without lag or technical glitches. Through a continuous process of refinement, the PAANTU BANG prototype can evolve into a more stable version ready to be played by users.

6. Finishing

This is the last stage, once the revisions are complete and the game is declared stable, the project is exported in .exe format so that it can be run on Windows-based devices. This exe file is then uploaded to the itch.io platform, allowing players to download and play PAANTU BANG for free. The game is then published on Itch Io:
 https://almeera96.itch.io/paantubang.

III. RESULT AND DISCUSSION

As briefly mentioned earlier, PAANTU BANG: Pasar Hantu Bangka is a cultural tycoon game. PAANTU BANG consists of three Indonesian informal words: "apaan-paan" (what), "itu-tu" (that), and "bang" (Indonesian honorific for older brother). So it means "what is that, brother", while the meaning itself has nothing to do with the game, since it is merely an abbreviation of "Pasar Hantu Bangka". Pasar Hantu Bangka is the Indonesian formal phrase that translates as "Market of Bangka Ghost". These phrases consist of three words: "pasar" (market), "hantu" (ghost), and "Bangka" (an Island in Bangka Belitung Islands of Province in Indonesia).

This game is entitled as "Pasar Hantu Bangka" because in the initial plan, the game has several sellers and the map is Bangka themed areas. Unfortunately, due to the time constraint of the Game Fest submission, resources, and the human resources that the writers possess, the writers decided to solely create a character as a mie ikan seller with a stand and two characters who act as customers.

A. *Gameplay Mechanics*

When the player launches the game, the Godot logo appears for 2 seconds, then it displays the main menu as shown in Figure 2.

Figure 3. Main Menu

In this main menu in Figure 3, the player may choose to mute or unmute the audio, start the game by clicking "mulai", see the credits by clicking the "kredit" button, or exit by clicking the "keluar" button.

It can be observed from Figure 3 that after clicking the "mulai" button, now the player is required to perform procurement of each item that is necessary for cooking the mie ikan: noodle, topping set, bowl, and water. Because the player is not going to be able to start the game if any of the item's value is 0.
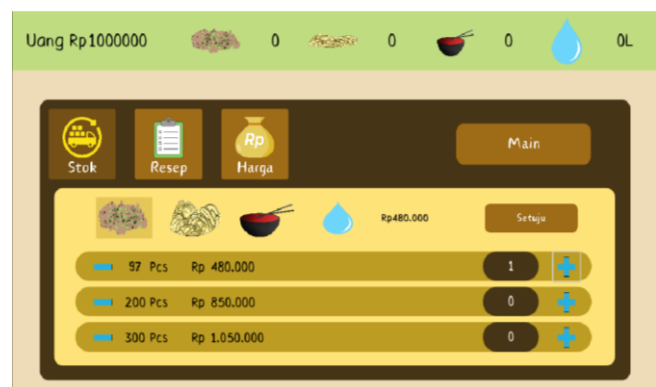

Figure 4. Shopping the Stock

The player is required to confirm by clicking "setuju" when purchasing each item as displayed in Figure 4. Then, a pop-up message is going to appear such as Figure 5 and the player should decide whether they wish to perform the transaction or not.
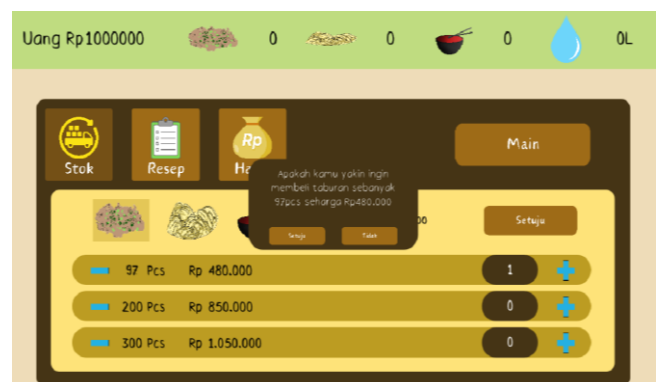

Figure 5. Pop Up Confirmation Message on Purchasing a Set of Items

Now the player needs to set the ingredients based on the real-life situation. The authors who also act as the developer

team (VAR Production), tried to make the amount of each ingredient as close as possible with the real mie ikan (Figure 6). On the right-hand side of the ingredient's menu, there are estimation of the portion that can be made based on the available stocks and recipe and also price per portion that is calculated based on the front cost.

Figure 6. Recipe Submenu

Then again, it is necessary for the player to confirm the ingredients first, and another pop-up message shall appear (Figure 6).

Figure 7. Pop up Confirmation on Recipe Submenu

Lastly, the player should move to the price submenu to set the price per portion of the mie ikan. On the left-hand side, there is an estimation of profit/loss per portion while on the right-hand side there is an estimation of the total profit/loss based on the total portion that can be made which previously showed on the recipe submenu. If the selling price is higher than the default selling price, a warning pop up window shall show up (Figure 8).

Figure 8. Pop up Confirmation on Recipe Submenu

Finally, the player may start to sell the mie ikan by clicking on the "play" (main) button.
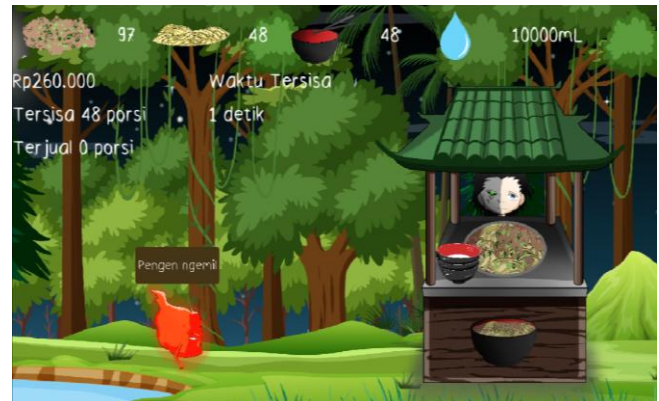

Figure 9. In-Game

In the in-game (Figure 9), it displays the stock of each item, cash balance, remaining portion, sold portion, and time left (5 minutes). There is also a seller who is a ghost named "Mawang" that stands behind the stall. There are customers, currently two ghosts available, who are "Sumiyati", a female ghost and "Antu Pulung", a flame ball-like ghost. They may or may not make a purchase at the player's stand. If a customer makes a purchase, they are going to comment about the taste whether it's good or not, or they will criticize that the price is too pricey or very affordable. When the time is up, a congratulations or game over screen shall be displayed as in Figure 10 and Figure 11. Then, they are going to be directed to the credit's pages (Figure 12 and Figure 13).

Figure 10. Congratulations

Figure 11. Game Over

Figure 12. Credits-Page 1

Figure 13. Credits-Page 2

B. Cultural Elements

In Paantu Bang: Pasar Hantu Bangka, there are several Bangka Belitung Islands of Province's iconic ghosts and cuisine.

- Mie ikan (fish noodle): a traditional noodle dish from Bangka Belitung, Indonesia, celebrated for its unique blend of handmade noodles and tender local fish, typically mackerel or snapper. The dish features a rich, umami-flavored broth made from fish stock and seasoned with garlic, shallots, and ginger. Toppings such as green onions, fried shallots, add extra flavor and texture. Cherished for its comforting and hearty qualities, Mie ikan highlights the region's maritime culture and abundant seafood, making it a popular choice among locals and visitors alike [22].
- Mawang: a two-faced ghost, half of his face is a human's face, while another half is an ugly monstrous face, long hair, and long nails. He lives in the forest and consumes livestocks, but only their liver.
- Sumiyati: she is similar to Kuntilanak, but back then when she was still alive, she was heavily depressed because of a man who made her disappointed. One day, she went missing in the forest, then the news about a man's death in a forest was spread.
- Antu Pulung (Anton): a flame ball ghost who sucks newborn babies' blood. It is actually a human who learns dark magic and transforms into Antu Pulung because they seek an eternal life [23].

C. Educational Value

The video game PAANTU BANG: Pasar Hantu Bangka, developed by VAR Production, offers significant educational value by merging business management concepts with cultural heritage elements. This cultural tycoon game allows players to experience the process of building and managing a fish noodle business, which includes handling procurement, setting prices, and managing customer satisfaction. These gameplay mechanics provide players with a practical understanding of essential business principles such as resource management, financial planning, and customer service.

Moreover, the game incorporates local cultural elements by featuring traditional Bangka Belitung dishes like Mie Ikan and characters inspired by regional folklore, such as Mawang, Sumiyati, and Antu Pulung. This not only enriches the gameplay experience but also educates players about the cultural heritage of Bangka Belitung. By integrating these cultural aspects, the game fosters an appreciation for local traditions and encourages players to learn more about the diverse cultural backgrounds of Indonesia.

Overall, PAANTU BANG: Pasar Hantu Bangka serves as an innovative educational tool that combines entertainment with learning, making it a valuable resource for teaching both business acumen and cultural awareness.

IV. CONCLUSION

The development of the video game "PAANTU BANG: Pasar Hantu Bangka" by VAR Production exemplifies an innovative approach to educational gaming, merging business management principles with cultural heritage elements. By simulating the process of running a fish noodle business, players gain practical insights into resource management, financial planning, and customer service, all essential aspects of entrepreneurship. Additionally, the game enriches the player's experience by incorporating traditional dishes and folklore characters from the Bangka Belitung Islands, fostering an appreciation for local culture and traditions. This blend of educational content and cultural awareness demonstrates the game's potential as a valuable learning tool, combining entertainment with meaningful educational outcomes. This work is limited to developing a cultural tycoon game prototype as a media to promote Bangka folklore and fish noodle as Bangka Belitung Islands of Province cultural heritage. The effectiveness of utilizing the proposed work to promote Bangka Belitung Islands of Province culture to the players may give valuable contribution for the future works.

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