Exploring the Indonesian Judicial System: Design and Development of 2D Assets for Video Games Using Research and Development Methodology

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Abstract

Indonesia's judicial system is a complex structure filled with intricate elements that make it a whole institution for administering justice. Video games can allow people to engage with it and help explore Indonesia's judicial system interactively and uniquely. 2D assets significantly impact video games as they can enhance the playing experience and overall quality of the game. The present study aims to design and develop 2D game assets for the development of a video game based on the Indonesian judicial system The development process of the 2D assets will utilize a research and development methodology to ensure that the designed assets not only meet aesthetic standards but also accurately reflect the cultural and procedural aspects of the judicial system, thereby enriching the educational value of the game. Through this, we posit that the video game can serve as an effective tool for educating the younger generation about the Indonesian judicial system and potentially inspire interest in the field of law and justice.

Keywords: 2D Game Artist, Indonesia's Judicial System, 2D Assets, Character Design, Background and UI Design
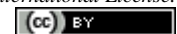
1. Introduction

Indonesia's judicial system is a complex structure with many different courts and legal institutions responsible for administering justice while maintaining the country's rule of law [1]. This complex system is the basis of justice and the rule of law, including religious, state, military, and administrative courts. For example, the religious courts operate according to Islamic principles and uphold the values of Pancasila and its 1945 Constitution, which add a unique layer to the legal framework. The existence and roles of these various courts and legal institutions highlight the importance of understanding the Indonesian judicial system in different contexts [2]. Video games are no longer viewed as entertainment but have become a powerful platform for storytelling, cultural expression, and education [3]. Video games offer a more interactive and unique experience to players. The stories feel immersive and personal, allowing players to become attached to the characters they encounter in-game, which can make it easier for them to absorb lessons as they advance through the game [4]. Nier Automata is a game with a compelling narrative that incorporates the works of great philosophers into its storytelling. It successfully combines intense combat, an engaging storyline, and intriguing characters while integrating philosophical elements for players to contemplate. Indonesia's judicial system in the form of video games provides an opportunity for players to engage and explore the judicial system. By playing these video games, we could expect players to develop a sense of fairness or justice and foster a deeper understanding of the complex social structure and issues. This research aims to design and develop 2D assets that make the players understand and interested in Indonesia's judicial system.

2D assets play a crucial role in video games because they enhance the player's experience and contribute to the overall quality and success of the game [5]. These assets include 2D graphics, animations, backgrounds, characters, and other visual elements that bring the game world to life. They provide visual appeal, set the tone and atmosphere of the game, and help convey important information to the player [6]. An example of a 2D game that excels in its art style and how it enhances the game atmosphere is a game called "Hollow Knight". The hand-drawn 2D graphics in "Hollow Knight" create a visually stunning and immersive world for players to explore. The detailed environments, unique character designs, and smooth animations showcase the potential impact that 2D assets can have on a game's visual appeal and overall enjoyment.

In this study, we elaborated on the process and development of 2D assets required to develop video games using the Research and Development (R&D) Methodology. This methodology allowed us to systematically approach the design and creation of the 2D assets, ensuring that they effectively convey

important aspects of the judicial system and engage players meaningfully. It is fascinating to see how video games are not only entertaining but also have the potential to facilitate learning [7], problem-solving [8], and ethical contemplation [9]. Integrating elements of philosophy in video games is an intriguing aspect, providing players with an opportunity to engage in ethical reflection [10]. Through interactive gameplay, we can make the players explore and understand complex social structures and issues, such as Indonesia's judicial system, which opens new avenues for immersive learning experiences [11], [24].

According to prior studies, video games effectively promote critical thinking, problem-solving, and leadership skills [12], [23], [26]. Researchers have explored the potential impact of video games in educating players about the judicial system. Some initiatives, such as Games for Change and Tilt Factor, have used video games to support ethical values, critical thinking, decision-making, and creativity in the context of the judicial system [13], [14]. These approaches recognize the power of video games as educational tools and highlight their potential to foster a deeper understanding of complex social structures and issues [15], [16], [17]. Through video games, players can actively engage with and explore the intricacies of the judicial system. This engagement can lead to skills development such as problem-solving, critical thinking, and empathy, which are essential in navigating real-world legal and ethical dilemmas [18], [19], [20].

2. Research Method

We used the Research and Development (R&D) Methodology to develop 2D assets (character and background assets) for this video game. For research, we will collect information related to the Indonesian judicial system through Google search and interviews with people who understand the Indonesian judicial system to deepen our understanding and observe its characteristics. We will collect the information from official sources and photo references from Google Images. Through exploration, we will collect information using relevant keywords such as Indonesian judge attire, and Indonesian courtroom from publicly acknowledged sources for its validity. We will also take our time to ask the people who understand this topic some questions to understand better how to input those elements into our asset creation. Understanding the complexities and intricacies of the judicial system will allow us to create a more accurate and engaging representation in the video game. To ensure the effectiveness of our game in conveying important aspects of the judicial system, we will also conduct interviews and surveys with legal professional individuals who have experience with the Indonesian judicial system. This will provide valuable

insights and perspectives that will inform the design and development of the 2D assets.

For development, we will use the ADDIE framework, which consists of Analysis, Design, Development, Implementation, and Evaluation - to design and develop these assets. The use of ADDIE ensures a structured and comprehensive approach in design and development [21], to accurately represent the elements of the Indonesian judicial system in the assets [22], [25] (See Fig. 1).
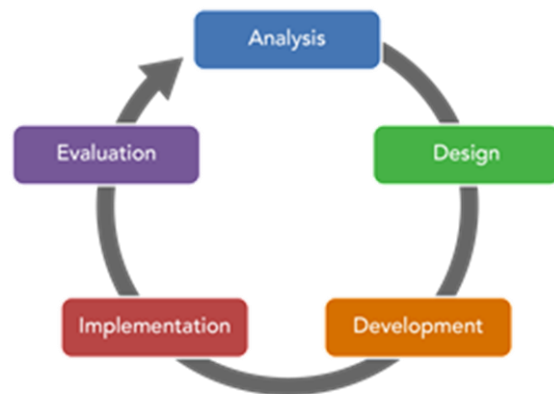

Figure 1. Illustration of ADDIE Development Framework

First is the analysis phase, in which we will research more about the character and background designs based on the existing script. For example, for the player character, we will design them as a judge and draw them wearing the Indonesian judge outfit. Then for the background, we will design it and add a few details according to the Indonesian courtroom like adding the national emblem of Indonesia which is Garuda. Continuing to the design phase, we will use the result of our research to create the rough sketch design, also considering several factors and then refining the concept. The Development Phase is where the design will be developed into a fully usable 2D character asset using Adobe Photoshop version 2022 and Procreate, an IOS-exclusive painting program. Next, the assets will be integrated into the video game during the implementation phase. Finally, The Evaluation Phase is where the assets are evaluated based on their compatibility with the video game. Evaluation of the assets is carried out by observing the asset design and assessing if the design fits the video game style. The accession is based on whether the character's visual display matches the game's background and tone.

3. Result and Discussion

This study showed that the development of the 2D assets for the video game successfully achieved its objectives. The assets accurately represented the

elements of the Indonesian judicial system and received positive feedback from legal professionals. Using the ADDIE framework in the design and development process ensured a structured and comprehensive approach, resulting in high-quality assets. The validation results for the assets showed that they were highly valid and effective in representing the Indonesian judicial system. The feedback from legal professionals confirmed the accuracy and effectiveness of the 2D assets in representing the Indonesian judicial system.

The 2D assets being developed consist of characters and backgrounds. The development starts with searching, collecting, and observing photo references of relevant subjects to the assets using a search engine in the form of a Google search image. Keywords such as 'pakaian hakim Indonesia', 'pakaian pengacara Indonesia', and 'ruang sidang Indonesia' were used in the search engine to get the desired result. While collecting the photo reference, we also keep in mind the validity and quality of the reference photos by observing the general similarity of the pictures gathered and then cross-checking with a valid source that can confirm the validity of the reference (See Fig. 2).

Figure 2. Photo References for Characters, Background, and UI

For the analysis phase, we will separate it into two parts; first are the characters. For the characters, we developed 8 distinct characters that will appear and be used in the game. Those characters consist of the male/ female main character, the lawyer, the public prosecutor, the maid, Sarah, Andi, and Anton. The second part is the background and UI of the game. For the background, we developed 4 different types of background sketches for the game, and they are the courtroom background, the office background, the menu background, and the room background. For the UI elements, we developed a lot of UI icons that will be used in the game's user interface and menus such as the game logo, settings icon, home icon, and more.

After the analysis, we proceeded to the design phase. In the design phase, we started by sketching rough sketches for the characters and backgrounds based on the analysis and photo references gathered. For the characters, special attention was given to their

appearance, clothing, and accessories to match the Indonesian judicial system. For the backgrounds, we focused on creating a sense of atmosphere and environment that accurately represents the Indonesian courtroom and related settings. As for the UI elements, we designed them to have a clean, minimalist aesthetic that complements the overall visual style of the game.

After that, the rough sketches are to be refined into a cleaner and more concise design that will be used as a reference for further development of the assets. The refined sketches will then be developed into fully rendered 2D characters and background assets using digital painting software like Adobe Photoshop and Procreate (See Fig. 3).
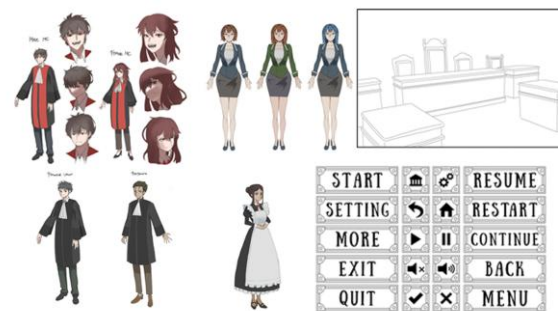

Figure 3. Rough Sketches of the Characters and Game UI

After the design was refined enough, we started working on the in-game assets. The workflows are as follows: sketch, line art, coloring, shadows, and lighting. We start by sketching out how the assets will appear in-game, for the characters, they will be depicted front-facing due to how they will be presented in-game. We will sketch out the overall composition and layout used for the background. And for the UI elements, we will start with the basic structure and layout first.

When the sketch is done, we will proceed to do lineart based on the sketch that was made before, the lineart must be done while also keeping in mind the line weight to make the lineart look interesting. Next, we colored the lineart above using assorted colors. For example, the Female MC uses a variation of colors consisting of desaturated red (#8a5a5a), saturated red (#ce544d), white (#eeeee), light-dark (#4c4c4c), and desaturated orange (#ecb491). While the background uses a more muted and washed-out color palette to establish the mood and atmosphere. The UI elements utilize a flat and minimalist color scheme to keep the interface clean and understandable.

After the coloring is done, we then give shading to the drawing, to give it a sense of form, while keeping in mind where the light is directed from. Finally, we employ lighting to the drawing, to highlight features of the drawing and give a sense of depth to it (See Fig. 4).

Figure 4. Finished Assets of Character and Background

Visual representation in video games is crucial as it impacts both the player's experience and the game's educational potential, this claim is supported by a study in 2020 [5]. In the context of this project, accurate visual elements help authentically portray the Indonesian judicial system by presenting visually what elements are inside it, thereby ensuring that players gain a realistic understanding of its operations. According to a study done in 2018 [6], A meticulously crafted visual representation enriches the narrative and reinforces the authenticity of the game's setting, making the experience more immersive and credible. Incorrect or superficial visual depictions could lead to misinterpretations or perpetuate stereotypes, undermining the educational objectives of the game. We utilized the ADDIE framework in the design and development process, successfully creating accurate and effective 2D assets for the video game. This enhanced the quality of the assets and reinforced the relevance and value of the ADDIE framework within the broader context of digital arts development.

Video games often navigate the delicate balance between realism and escapism. In educational games like the one developed in this study, realism is critical as it lends authenticity to the subject matter—in this case, the Indonesian judicial system. Realistic representations help players learn and engage with real-world systems in a meaningful way, reinforcing the educational goals of the game. However, the element of escapism in video games should not be overlooked. While the game aims to educate players about the judicial system, it also needs to be enjoyable. This dualism of educational games is also found in games like Phoenix Wright, Minecraft, and Nier Automata, highlighting the importance to game developers and educators. Striking the right balance between realism and escapism can enhance the player's engagement without compromising the educational content. Escapism provides a break from reality, which is one of the reasons people play video games. The challenge lies in incorporating educational content into an experience that still allows for the escapism players seek, creating a compelling, informative, and entertaining game. This balance between realism and escapism is crucial for the success of educational video games. It ensures that while the game serves as a

learning tool, it also provides an enjoyable experience that captivates and maintains the player's interest.

The video game industry has recently faced increasing scrutiny regarding Diversity, Equity, and Inclusion (DEI). Video games have the power to shape perceptions and attitudes, making it essential that they reflect diverse cultures and perspectives accurately, however, DEI should not be abused to include everyone, diversity and inclusivity should adhere to the theme and setting of the video game. For this project, DEI considerations were integral to the asset development process, DEI should be used appropriately so that entertainment and educational value, especially among educational games, developed in harmony. By incorporating characters and environments that reflect Indonesia's diverse legal and cultural landscape, the game strives to foster a deeper understanding and appreciation of this diversity among players. In the broader context of game design and the video game industry, DEI must be applied thoughtfully and in line with the game's theme and setting. Forcing diversity where it feels out of place—such as playing an Asian character in a Slavic setting or a Caucasian character in a Middle Eastern environment—can disrupt the player's immersive experience. DEI should be used to enhance both entertainment and educational value, especially in educational games, allowing for an authentic and harmonious narrative. This approach avoids cultural homogenization and promotes an inclusive narrative that resonates meaningfully with a wide range of players. However, the video game industry still struggles with representation, particularly in how characters from various cultural backgrounds are depicted. Developers need to be mindful of these issues to create content that is not only engaging but also respectful and accurate. Culture from various backgrounds should be cherished and celebrated, not segregated. The current video game industry needs to reflect on this premise—not to weaponize cultural appropriation or ridicule certain cultural groups, but to explore how video games, as a medium, can educate players about cultural values from around the world. Addressing DEI in video game design ensures that all players feel represented and that games contribute positively to cultural understanding and sensitivity, fostering a more inclusive and enriched experience for players.

In general, the use of the research and development method is essential in developing visual assets for video games, as it ensures a structured and comprehensive approach to the design and development process. Therefore, assuring us of developing high-quality assets with ease and confidence. Developing high-quality visual assets is crucial in video games as they play a vital role in immersing players in the game world and effectively conveying the narrative and thematic elements of the game. Furthermore, visual assets enhance the overall

gaming experience by capturing the player's attention and fostering emotional connections with the characters and environments, which ultimately contributes to player engagement and satisfaction in the gameplay experience. The future of visual asset development in video games is likely to be influenced by technological advancements, with more techniques being developed to ease and effectively hasten the process, enabling more efficient production methods and innovative design possibilities.

4. Conclusion

In conclusion, this study has successfully demonstrated the development of accurate and engaging 2D assets for a video game that effectively represents the Indonesian judicial system. By utilizing the ADDIE framework within an R&D methodology, the design and creation process ensured a structured and comprehensive approach, resulting in high-quality assets that received positive feedback from legal professionals.

The results of this study affirm the importance of using a structured methodology like ADDIE in the design and development of 2D assets for video games, particularly those with educational purposes. The 2D assets developed effectively represent the Indonesian judicial system, offering both an engaging gameplay experience and an educational tool that accurately reflects cultural and procedural realities. The key findings highlight the ability of the 2D assets to accurately depict the elements of the Indonesian judicial system, while also providing a visually compelling and meaningful experience for players. The insights from this research can be valuable for other developers looking to create 2D assets that authentically represent real-world systems or environments in video games.

Moving forward, we recommend further studies be conducted to explore the application of additional research methodologies, such as user experience evaluations, to enhance the overall effectiveness and engagement of the 2D assets developed. Future research should continue to explore these themes, particularly how DEI considerations and the balance between realism and escapism can be optimized in video game design. By continuing to refine and improve the design process, we can ensure that video game assets effectively balance accuracy, visual appeal, and player immersion. Accurate and engaging representation, coupled with robust methodologies, will be key to advancing the field of educational video games.

References

[1] A, I. R., Suhartono, R. M., & Salam, S. (2021). Implementation of state Administrative court decisions: conception, and barriers. *Musamus Law Review, 3(*2), 49–57. https://doi.org/10.35724/mularev.v3i2.3449

[2] Yusa, I. G., Hermanto, B., & Ardani, N. K. (2021). *Law reform as the part of national resilience: Discovering Hindu and Pancasila values in Indonesia's Legal Development Plan. Advances in Social Science, Education and Humanities Research/Advances in Social Science, Education and Humanities Research.* https://doi.org/10.2991/assehr.k.211221.001

[3] Cerezo-Pizarro, M., Revuelta-Domínguez, F., Guerra-Antequera, J., & Melo-Sánchez, J. (2023). The cultural impact of video games: A systematic review of the literature. *Education Sciences, 13*(11), 1116. https://doi.org/10.3390/educsci13111116

[4] Bormann, D., & Greitemeyer, T. (2015). Immersed in virtual worlds and minds. *Social Psychological and Personality Science, 6*(6), 646–652. https://doi.org/10.1177/1948550615578177

[5] Patton, R., Sweeny, R. W., Shin, R., & Lu, L. (2020). Teaching digital game design with preservice art educators. *Studies in Art Education, 61*(2), 155–170. https://doi.org/10.1080/00393541.2020.1738165

[6] O'Dwyer, R. (2018). Limited edition: Producing artificial scarcity for digital art on the blockchain and its implications for the cultural industries. *Convergence the International Journal of Research Into New Media Technologies, 26*(4), 874–894. https://doi.org/10.1177/1354856518795097

[7] Saputra, D. (2018). Developing student vocabulary mastery through video game. *Qalam Jurnal Ilmu Kependidikan, 6*(1), 47. https://doi.org/10.33506/jq.v6i1.251

[8] Lutfiana, L., & Hidayah, R. (2020b). Validity of computer-based electrolyte fisher game to develop problem-solving skills of students in electrolyte and nonelectrolyte solution. *UNESA Journal of Chemical Education, 9*(3), 361–370. https://doi.org/10.26740/ujced.v9n3.p361-370

[9] Cabellos, B., & Pozo, J. (2023). Can video games promote moral cognition? Supporting epistemic play in Papers, Please through dialogue. *Education Sciences, 13*(9), 929. https://doi.org/10.3390/educsci13090929

[10] Kjeldgaard-Christiansen, J. (2020). Narrative video game aesthetics and egocentric ethics. *MedieKultur Journal of Media and Communication Research, 36*(68), 088–106. https://doi.org/10.7146/mediekultur.v36i68.118777

[11] Menezes, C. C. N., & De Bortolli, R. (2016). Potential of gamification as assessment tool. Creative Education, 07(04), 561–566. https://doi.org/10.4236/ce.2016.74058

[12] Li, J. (2016). Video games in classrooms: an interview with Zack Gilbert. *On The Horizon the International Journal of Learning Futures, 24*(3), 205–209. https://doi.org/10.1108/oth-03-2016-0009

[13] Liang, S., Li, H., & Yang, X. (2014). The video game from the perspective of positive psychology. *Open Journal of Social Sciences, 02*(08), 57–60. https://doi.org/10.4236/jss.2014.28009

[14] xCoAx 2021: Proceedings of the 9th conference on computation, communication, aesthetics & X. (2021). *In i2ADS, GEGOT, CITTA eBooks*. https://doi.org/10.24840/978-989-9049-06-2

[15] Cole, C., Parada, R. H., & Mackenzie, E. (2023). *Why and how to define educational video games? Games and Culture*. https://doi.org/10.1177/15554120231183495

[16] Holbert, N. R., & Wilensky, U. (2014). Constructible authentic representations: Designing video games that enable players to utilize knowledge developed in-game to reason about science. *Technology Knowledge and Learning, 19*(1–2), 53–79. https://doi.org/10.1007/s10758-014-9214-8

[17] Staiano, A. E. (2014). Learning by playing: Video gaming in education—A cheat sheet for games for health designers. *Games for Health Journal, 3*(5), 319–321. https://doi.org/10.1089/g4h.2014.0069

[18] Formosa, P., Ryan, M., Howarth, S., Messer, J., & McEwan, M. (2021). Morality meters and their impacts on moral choices in video games: A qualitative study. *Games and Culture, 17*(1), 89–121. https://doi.org/10.1177/15554120211017040

[19] Kocurek, C. A. (2018). Walter Benjamin on the video screen: Storytelling and game narratives. *Arts, 7*(4), 69. https://doi.org/10.3390/arts7040069

[20] Xu, E. (2022). Replication data for: Supplementary information for data analyse. *In Harvard Dataverse*. https://doi.org/10.7910/dvn/ipfjo6

[21] Wibowo, T., & Canesta, F. (2021b). Perancangan dan pengembangan avatar character 2D menggunakan metode PDDIE. *Journal of Animation & Games Studies, 7*(2), 145–156. https://doi.org/10.24821/jags.v7i2.5512

[22] Wibowo, T., & Xie, F. (2022b). An RPG game design for english learning using ADDIE methods. *Science Tech Jurnal Ilmu Pengetahuan Dan Teknologi, 8*(1), 74–88. https://doi.org/10.30738/st.vol8.no1.a11990

[23] Alotaibi, M. S. (2024). Game-based learning in early childhood education: A systematic review and meta-analysis. *Frontiers in Psychology, 15*. https://doi.org/10.3389/fpsyg.2024.1307881

[24] Li, Z., Li, W., & He, Y. (2024). Bury Me Here --The new genre of narrative design game based on immersive storytelling. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2403.08903

[25] Moon, J., & Khan, N. (2024). Navigating the serious game design landscape: A comprehensive reference document. *arXiv (Cornell University)*. https://doi.org/10.48550/arxiv.2404.10649

[26] Kiili, K., Siuko, J., & Ninaus, M. (2024). Tackling misinformation with games: A systematic literature review. *Interactive Learning Environments, 1*–16. https://doi.org/10.1080/10494820.2023.2299999