

Gamification development in virtual tour Cau Belayu tourism Village

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ABSTRACT

The use of digital marketing is not only specifically for business processes but can also be utilized in the tourism sector. Tourist information, especially tourist villages, can be easily searched via the internet and social media. There is no need to use conventional promotional media, print brochures or advertisements in the mass media, which will cost a lot, especially for tourism village managers. Virtual tour is an example of digital promotional media that is currently developing because it can display real tourist destinations without having to come to the location in person. However, virtual tours only display static images or videos and do not interact with users or tourists other than information, this causes the virtual tour to not have a significant effect on tourist interest to visit in person. There is a need for further development of virtual tours to make it more attractive to tourists to visit, one way is by combining it with other technologies, namely gamification. This research develops a gamification application on a virtual tour for Cau Belayu Tabanan Tourism Village. By applying gamification to the virtual tourist village tour, it is hoped that tourists will be able to experience a more enjoyable and significant impact on tourist interest in visiting the Cau Belayu Tabanan tourist village directly. The research method used refers to the MDLC (Multimedia Development Life Cycle). The research method consists of the stages of concept, design, material collecting, assembly, testing and distribution. The results of this study are in the form of a gamification application in the virtual tour of the Cau Belayu Tabanan Tourism Village which has the main features, namely games, gamescores and game finishes.

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1. Introduction

The rapid development of information and communication technology has made many processes carried out digitally, one of which is in the field of marketing, which is better known as digital marketing [1]. The advantages of digital marketing are that it is more effective and efficient in reaching the market, more interactive and more flexible in adjusting to market needs and current trends [2]. The use of digital marketing is not only specifically for business processes but can also be utilized in the tourism sector [3]. Tourist information, especially tourist villages, can be easily searched via the internet and social media, there is no need to use conventional promotional media, print brochures or advertisements in the mass media, which will cost a lot, especially for tourism village managers [4]. By utilizing digital promotional media, tourism villages can introduce their unique and interesting tourism potential, reach a wider and more targeted audience and increase the effectiveness and efficiency of tourism village promotion [5], [6]. Virtual tour is an example of digital promotional media that is currently developing because it can display real tourist destinations without having to come to the location in person [7]. Virtual tours can also reduce people's psychological pressure during

the COVID-19 pandemic [8]. Apart from that, many companies adopted virtual tours during the COVID 19 pandemic [9]. However, virtual tours only display static images or videos so there is no interaction with tourists. In addition, there are no more advantages for tourists in using virtual tours besides getting information so that the use of virtual tours has less significant effect on tourist interest to visit in person. There is a need for further development of virtual tours, one way is by combining it with other technologies, one of which is gamification. Gamification is a technique used to change monotonous tasks or activities to be more interesting and fun by adding game or competition elements [10]. Gamification development usually includes features in games such as tiers (levels), points, and rewards depending on needs, with this feature the user will not only find information or learn, but also get useful feedback. profitable [11]. For example, several star hotels use a gamification system of point exchange and rewards that can be exchanged for various facilities and benefits that can be obtained by guests so that there is an increase in guest loyalty to stay again [12]. Gamification has been widely used in various fields such as learning [13]–[21] and tourism [22]–[33], financial [34]–[37], government [38], business [39], [40]. In the gamification developed in this study, a game component is also added in the form of rewards for tourists so that tourists also benefit because these rewards or points can be exchanged for vouchers which will apply later when tourists visit tourism villages. Research related to gamification in the field of tourism was carried out by those who stated that by implementing gamification users obtained intrinsic motivation, fantasy, entertainment and competition between users, besides that it had an effect on increasing tourist interest in their tourist destinations [41]. Another research by [42] related to the use of gamification in e-commerce states that the development of gamification increases the tourism industry in new cities, especially for local businesses and entrepreneurs because it motivates some local businesses to have goals and achieve them by having points as prizes shown in the application. Another research by [43] states that the use of gamification in the tourism industry offers various opportunities such as tourism marketing and new generation awareness, attracting potential customers, enhancing the tourist experience in places and increasing interaction because the gamification design is based on the real environment of tourist attractions (such as Thailand and China). Referring to the problems previously described, this research developed a gamification application for a virtual tour of Cau Belayu Tabanan tourism village. The development of a virtual tour in the tourist village of Cau Belayu has been carried out in previous studies [44]. This research builds on previous research by adding gamification technology. By applying gamification to virtual tourism village tours, of course the tourism village managers are helped by the existence of more dynamic promotional media due to interactions between tourists and applications so that the name of the tourist village is better known. In addition, tourists with this gamification development not only get information related to tourist villages, they can also benefit in the form of rewards if they successfully complete challenges such as puzzles or quizzes which can later become vouchers that can be exchanged when visiting tourist villages. This is expected to have a significant effect on the interest of tourists to visit the tourist village of Cau Belayu Tabanan directly. This research also supports the Center for Excellence in Green Tourism Technology of the Bali State Polytechnic because this research produces products in the form of applications that are efficient and environmentally friendly so as to minimize the use of promotional media in the form of brochures or other printed materials. The aim of developing gamification in the virtual tour of the Cau Belayu Tourism Village in Tabanan is as a digital promotional medium and attracting tourists who come to the Cau Belayu Tourism Village with rewards in the form of vouchers that can be exchanged when visiting the tourist village.

2. Method

The method of this research refer to the multimedia development method, namely MDLC (Multimedia Development Life Cycle) [45]. In general, research that develops multimedia platforms uses the MDLC model [46], [47]. The method carried out in this research as shown in Fig. 1 can be explained as follows :

- Concept

Formulate the basics of the multimedia project to be created and developed, especially on the purpose and type of project to be created. The concept of this research is to develop gamification on virtual tours to increase tourists' desire to visit tourist villages directly with a reward system.

- Design

Describes in detail what will be done and how the multimedia project will be made. At this stage, the application design is made using UML (Unified Modeling Language).

- **Material Collecting**

Collecting everything needed in the project such as material to be delivered and then multimedia files. At this stage, material is collected in the form of ideas, writing, history, pictures, audio and video. Collecting materials for this application was done by making direct observations at the Cau Belayu Tourism Village and interviews with Cau Belayu village officials and Cau Belayu tourist village managers regarding history, tourist attractions and others. Apart from that, direct data collection was also carried out by taking videos and taking photos related to the Cau Belayu tourist village.

- **Assembly**

Compiling materials and multimedia files according to the designs previously made. At this stage the process of creating gamification in a virtual tour uses the 3DVista plugin.

- **Testing**

Conducting trials on multimedia projects that have been made. Testing is carried out using blackbox testing to find out all functions have been running and user acceptance testing to measure the level of user acceptance of the gamification application on the virtual tour.

- **Distribution**

Distribute the results of multimedia projects to users. At this stage the results of the gamification in virtual tour will be given to the Cau Belayu Tourism Village.

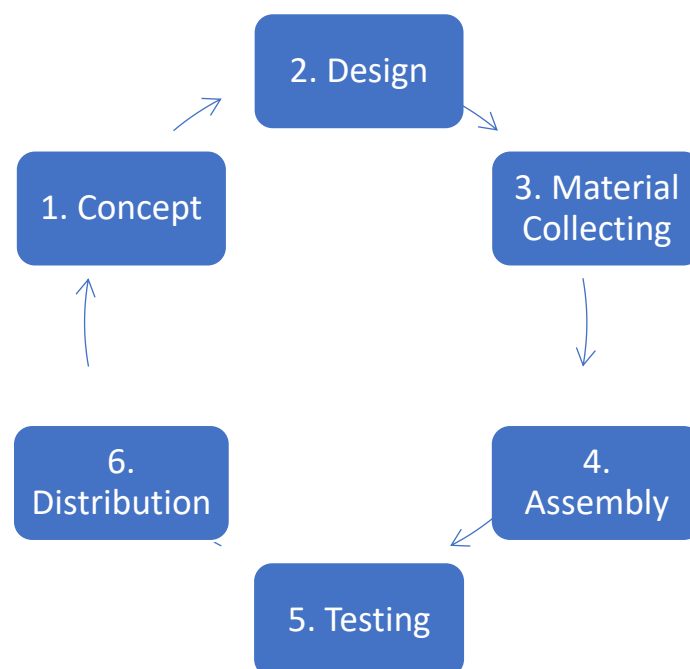


Fig. 1. Research Method

3. Results and Discussion

3.1. Concept

Based on the conditions found there are several problems that have the potential to occur such as: there is no container or platform for the promotion of tourism villages and tourism objects in the village and limited and unattractive social media content because it only displays photos of tourist objects and attractions in tourist villages, so there is no interaction for tourists to do. Based on the results of analysis and discussion with the management of the Cau Belayu Tabanan Tourism Village,

the proposed concept is to develop gamification on virtual tours in order to provide experiences for tourists to enjoy interesting digital tours in a more enjoyable manner because of the added games.

3.2. Design

Prior to the design stage, an analysis of system users was carried out, where the design user of the Gamification Virtual Tour Application for Cau Belayu Tabanan Tourism Village only had one user access right, namely guest. The use case diagram for the Gamification Virtual Tour Application for Cau Belayu Tabanan Tourism Village can be seen in Fig. 2.

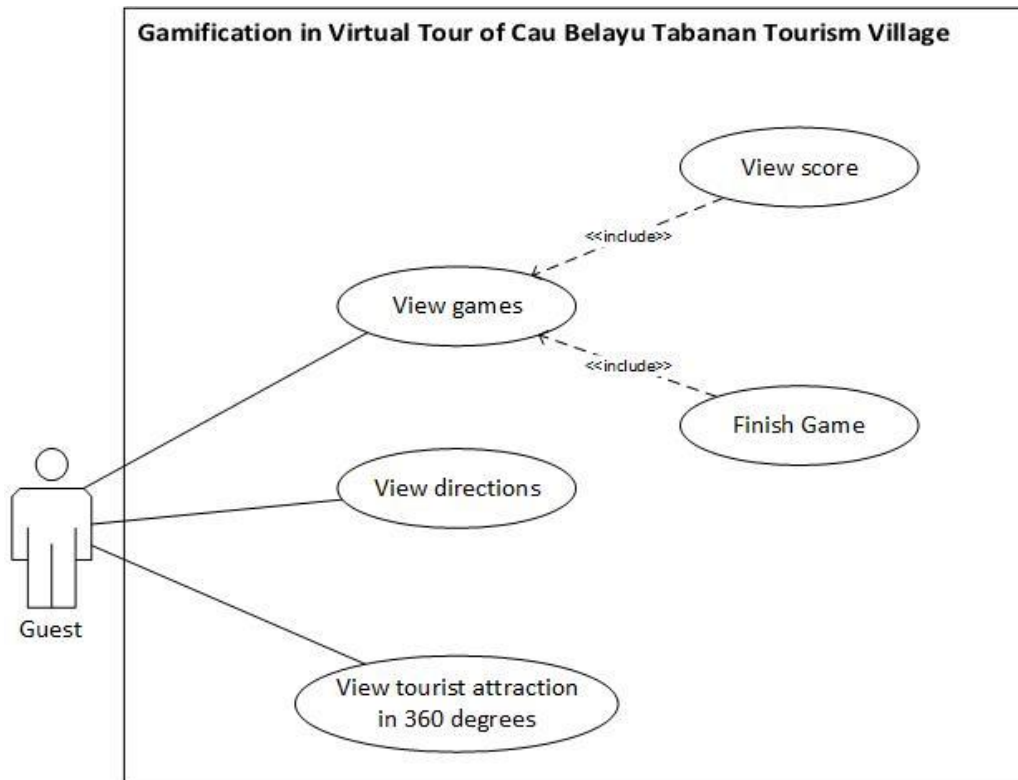


Fig. 2. Use Case Diagram

The use case diagram shows what features can be accessed by guests, these features include viewing and playing games, viewing live scores, stopping and repeating games, viewing directions to tourist attractions and viewing tourist attractions in 360 degrees.

3.3. Material Collecting

Collecting data on tourist destinations in the tourist village of Cau Belayu Tabanan as well as history related to the village. The results of this data collection are then arranged into quiz questions in the game. The questions made refer to the description of each tourist destination so that it is hoped that tourists really know about these tourist destinations.

3.4. Assembly

The process of making gamification on a virtual tour is done using the 3d vista plugin. The features contained in the gamification virtual tour application are Game Features, Score Game feature, Finish Game feature, Directions to tourist attractions, 360 degree tourist attractions. The results of system development can be seen as follows :

- Game Features

This feature is used to start playing games within the application. The type of game that will be played is in the form of a quiz containing questions related to tourist destinations in the Cau Belayu Tabanan tourist village. This feature is marked with an icon which when pressed will bring up a pop up in the form of a question and the answer choices. Game feature can be see in Fig. 3.

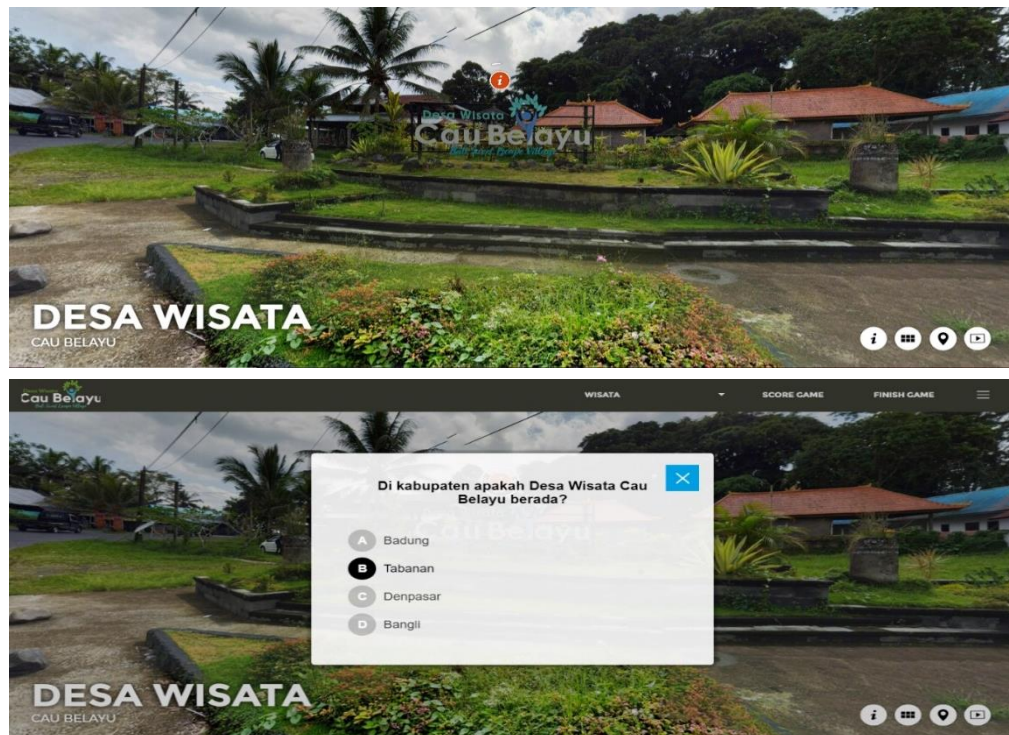


Fig. 3. Game Features

- Score Game Feature

This feature is used to display a live score from tourists who have played the game feature, consisting of the number of questions answered correctly, questions answered incorrectly and also the final score. The way to display the score is to select the score menu then the score will be displayed. Score game feature can be see in Fig. 4.

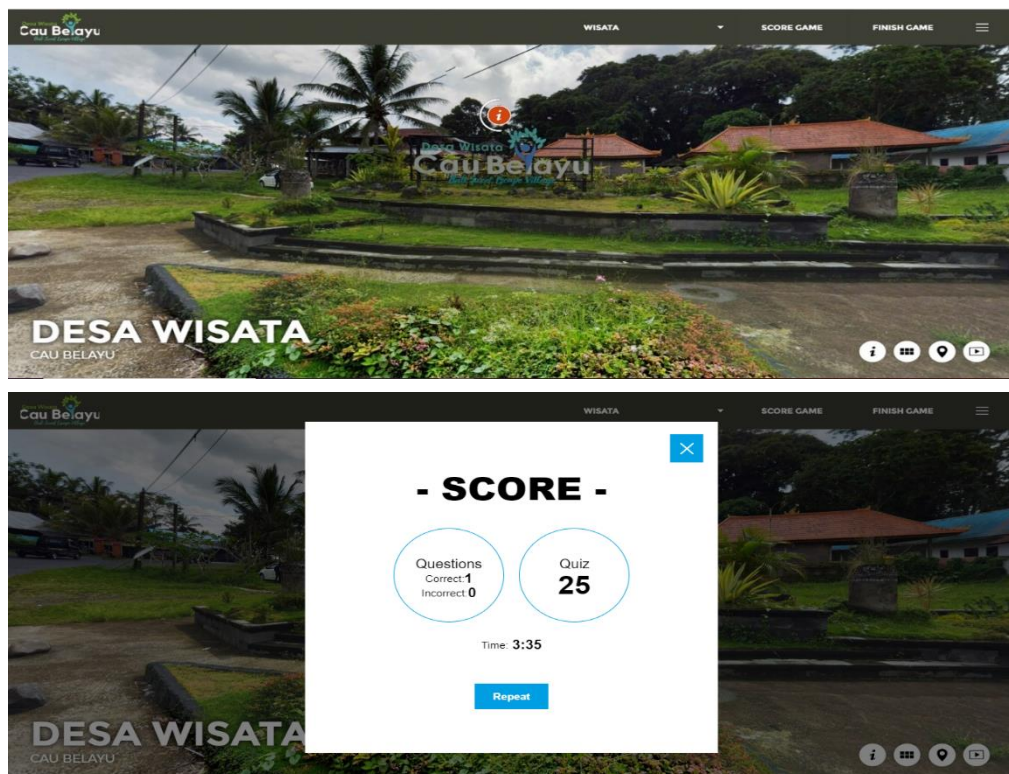


Fig. 4. Score Game Feature

- Finish Game Feature

This feature is used to stop a game that has been played previously and can also be used to restart playing the game from the beginning. The way to stop the game is to press the finish game button, a summary score will appear. Then to restart the game by pressing the repeat button.

3.5. Testing

Testing is carried out using black box testing to find out all functions have been running as expected. The way to test black box testing is to try each function in each Gamification application feature on a virtual tour then observe the input and output results of the application without knowing the application code structure. The results of the input and output testing are then recapitulated so that a conclusion can be drawn as to whether the application is running as expected. Blackbox testing scenarios can be seen in Table 1.

Table.1 Blacbox Testing Scenarios

Items Testing	Testing Scenario
Main Page	Show main page
Game	Show questions per attraction
Score Game	Show live score
Finish Game	Stops the game and restarts a new game
Directions to tourist attractions	Show directions to attractions
360 degree tourist attractions	View attractions in 360 degrees

Testing result can be seen in Table 2.

Table.2 Testing Result (One Scenario)

Finish Game Feature Testing				
Items Testing	Testing Scenarios	Expected Results	Observation	Conclusion
Finish Game	Click finish game sub menu	Show final score game	Can show final score game	Success
Repeat	Click finish game repeat button from score pop up	Redirect to main page	Can redirect to main page	Success

From the results of blackbox testing, it can be concluded that the gamification virtual tour application for the Cau Belayu Tabanan tourism village does not have process errors and functionally produces applications that are in accordance with the design.

3.6. Distribution

The distribution of the results of the gamification virtual tour application will be given to the Cau Belayu Tourism Village in the form of a website link <https://wonderfulcaubelayu.com/> making it easier for both villagers and tourists to access this gamification virtual tour application anytime and anywhere.

4. Conclusion

Based on the research that has been done, it can be concluded, development of the Gamification Virtual Tour Application for Cau Belayu Tabanan Tourism Village is one of the attractions as well as a two-way promotional media for the village, namely the interaction between users and applications so that the use of applications is more attractive. In addition, the existence of a reward system will be a very interesting consideration to increase tourists' desire to visit the village directly. From the test results using the blackbox testing method with 6 items tested, namely the main page, game, score, finish game, directions to tourist objects, 360 degree tourism objects, it can be concluded that the gamification virtual tour application for the Cau Belayu Tabanan tourist village does not have process errors and functionally produce applications that are in accordance with the design.

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