

Design of Smart Gamification In Village Tourism: An Indonesian Case Study

<https://doi.org/10.3991/ijep.v10i1.11522>

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Abstract—In 2018, public interest in Indonesia tourism reached 303 403 888 people. The benefits of tourist destinations in Indonesia finally form three patterns, namely natural, cultural, and human-made. City and village tourism are very popular with the community because of the high interest of the community to capture the moments of Instagram able and viral tourism spots. One of them is village tourism. For people who are educated with life in the village, it is necessary to make it more interesting with gamification. In this study, the aim was to change the pattern of visitors' activities, which initially only took pictures but were also invited to explore the village potential through a mobile application. Also, this study is used to improve and help preserve and introduce village tourism potential. Gamification can be an alternative to developing village tourism potential. A common occurrence in tourist villages is a lack of management innovation to add village tourism potential to visitors further. So, we design mobile village tourism for village education. This activity is an education that contains planting plants. The results of this application are of rice planting and fruit picking games. Each set consists of two levels. Level 1 includes educational games and level 2 games about team cohesiveness. Each game will offer a reward. The rewards that we design are based on prizes that are liked by elementary school students.

Keywords—Gamification, village tourism, farming, reward

1 Introduction

The public interest in the tour was very high. Interest in tourist destinations in Indonesia finally forms three patterns, namely natural, cultural and human-made tourism. Where the tourism destination model, nature and human culture in Indonesia around 303 403 888 people of local tourists make a tour to those places in 2018 [1]. The model shows that the most significant portion of cultural tourism, which is one of the supporting sectors of cities and villages. Tours of towns and villages "communities greatly due to the high interest of the community to capture the moment of the Instagram able and being viral. Social media, Instagram became an essential role in introducing a creative place [2]. One of them is by visiting the village. Here, there are

many people, especially urban people who come to take photos for photo collections on their social media [3].

So that the community also educated with life in the village, then it needs an appropriate technology. One of them is Gamification; this technology implemented in the educational world. The goal is to motivate and to overcome the lack of participation of students in the process of lessons in the classroom [4]. Gamification is also applied to evoke a sense of empathy with the environment [5]. This research aims to change the pattern of visitor activities that previously only photographs, but also are invited to explore the potential of the village through mobile applications. Also, this research used to boost as well as help preserve the tourist potential of the town and introduces to elementary school students. With this application, visitors get the opportunity to get exclusive prizes based on the ranking value on level 2 of some activities exploring the village.

Gamification can be an alternative development of the tourism potential of the village. Problems commonly occurred in the tourist village is the lack of innovation managers to introduce visitors to the village tourism potential better. The possibility to develop is village-based mobile education. This activity contains an educational farm later. This strategy is perfect for the school so that students learn better [6]. For farmers with the use of this modern technology helps farmers to farm to the socialisation of young people early on [7].

The workings of this application form will display the number of people who will be playing. If it is between two and five people will play the game pick fruit, and if the number of people between six and ten will play the game to plant rice. To determine the team, all participants must sign in to the system. There are two levels of this game. Level 1 contains educational games and level 2 game about the cohesiveness of the team for level 2 reward determination based on parameters of speed and accuracy of the weight of the fruit.

Besides, we will create a concept about the gamification theme we adopted. We will also make a gift what the participants' favourite in general and also how to make participants more enthusiastic to follow the game. The primary goal of gamification is the students to give them learning about planting rice until picking fruit. We will also try to make the right team division with the existing system to get optimal results in the game.

2 Related Work

Village development currently applies to the concept of village tourism. The idea uses on rural local wisdom as a superior sustainable program [8]. Knowledge also affects the local green economy in Pasuruan, Indonesia [9]. Also, the development of village tourism began to explore the use of, and the role of social media, the results of which were able to increase local and foreign tourists [10]. Conservation villages oriented towards natural and cultural tourism are of great interest to tourists; besides that, mobile communities are expected to protect the environment as village tourism branding [11]. Independent coastal village tourism is one of the nature-oriented vil-

lage tours [12]. Agricultural tourism also began much developed. This tour describes the transition of tourism in agriculture to agricultural tourism [13].

Gamification is the game design to society with the goal of non-gaming [14]. The application of gamification in the fields of education, health, and improving work ethics has a positive impact on effectiveness [15]. Gamification is also used to change the behaviour of the community for the sake of health and welfare in the form of e-health [16]. Long-term effectiveness needed to wake up with exploiting the core experiences and the psychological effect the mechanics of the game [17]. Also, design gamification should be firmly put design research and discussion in the theory of management and the critical study [18]. So hopefully, gamification can help the process of transformation of the various obstacles that block based on the mechanism of emotional gamification [19].

Gamification will increase motivation to learn about village tourism in a fun way. The determination of the team then the competition and collaboration system will play an essential role in the transformation process.

3 Proposed Method

The method intended is Village Tourism Gamification conducted by elementary school students so far is a contribution to gamification and related to team building, as well as competition and cooperation. Similar research has been applied to attracting people to visit museums [20].

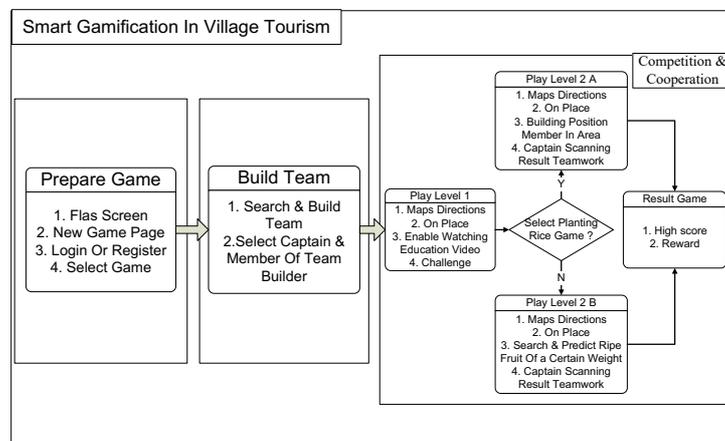


Fig. 1. The proposed method.

As a result, gamification can be a promotional medium so that people are interested in visiting museums with the advantage of gamification game content. Gamification was chosen because it is considered as an exciting technology to introduce new knowledge that is easily understood by elementary school students. The proposed

gamification is related to village education, especially in the field of farming. Team building, competition and cooperation are the basis of this gamification concept.

Figure 1 shows the proposed method. The system contains how to prepare the game, builds the team and competition and cooperation in the group. So, in this section, the author will explain the proposed system.

3.1 Team building

The formation of the team is an effective way to cultivate cooperation group to achieve a common goal or target [21]. The composition of the team was taken by way of random systems are derived from the database. This database contains data on visitors who have signed up. Here's how a user must log in and choose a game to be played. If the user selects the planting rice systems will form a team of users who go online and vote to plant rice. As for the terms of the group could continue the game if the number of participants between 6 and ten users. However, if the user selects picking fruit system will form a group of users that are online and choose to pick fruit. As for the condition, the team can continue the game if the number of participants is between 2 and five users. The system will determine the captain team randomly. The captain is in charge of validating the work of his team during the game. Then each user will be brought to the user page according to the random results of the group determination system and the user's role. There are two types of role users, namely captain mode and member mode. Each team has only one captain and many members according to the specified number of game users.

3.2 Competition and cooperation



Fig. 2. Illustration of member positioning during Planting Rice Games (Source Image: <http://solopos.com> (edited)).

Gamification Village Tourism elementary school students, there are two levels. Level 1 contains educational games and level 2 game about the cohesiveness of the team. Participation between people in the group or class is critical to get maximum results [22]. As for the flowchart of competition and cooperation game planting rice can be seen in figure 1 (Play Level 1 and Play Level 2 A). Level 1 contains educational games that include video learning and challenge. If the team has completed

level 1, then the team getting the reward 3. As for level 2 reward one determination based on parameters of speed and how the number of rows that were successfully cultivated rice crops. The team claimed for planting rice appropriate educational videos on the previous level within 1 minute. Members must place themselves in the position determined in the system see in figure.2. The captain then scans the results of his team's rice planting. The system will assess how many rows of rice have been planted using AI technology see in figure.3. AI technology is used to identify the results of neatness and lines that are planted automatically based on the results of scanning images using the RCNN method. The RCNN method is widely applied in various fields. Its application is to use images as input.



Fig. 3. Illustration of teamwork assessment Planting Rice Games with AI technology (Source Image: <http://tribunnews.com> (edited)).

Then flowchart the competition and cooperation game picking fruit can be seen in figure 1 (Play Level 1 And Play Level 2 B). Level 1 contains educational games that include video learning and challenge. If the team has completed level 1, then the unit gets reward 4. As for level 2 reward, two determination based on parameters of speed and accuracy of the weight of the fruit successfully picked. The team claimed for picking fruit and look for the appropriate weight that prompted the system within 1 minute. Then scan the results captain to pick the fruit of his crew above digital scales that have been provided. The system will do a substantial introduction by the target or not.

The workings of this application form will display the number of people who will be playing. If the number of participants is between 2 and five people will then play the game pick fruit, and if the number of participants between 6 and ten will play the game to plant rice. To determine the team, all participants must sign in to the system. There are two levels of this game. Level 1 contains educational games and level 2 game about the cohesiveness of the team for level 2 reward based on parameters of speed and accuracy weight fruit.

4 Result and Discussion

In this section, the authors will explain the results obtained and discuss them.

4.1 Reward requirement

Determination of reward in this paper using a sample of live interview elementary school students in Indonesia. The questions in the ask are what is the desirable reward elementary school students if winning a competition. Students ask to choose between trophies, smartphones, stationery and books. The results of the questionnaire address 8 of 20 elementary school students choose reward Trophy as a prize they wanted. Table 1 shows the details of the results of the questionnaire.

Table 1. The Questionnaire Result

No	Question	Number of Answers
1	If I select a prize competition win a smartphone	3
2	If I select the competition win a gift book	5
3	If I select the competition win a gift stationery	4
4	If I select the competition prize win trophy	8

Table 2 shows types of games, level, reward and requirement — determination of award based on the level of difficulty. Level 1 plating rice has a moderate level of trouble; the prizes offered are books and stationery for picking fruit because they have the most comfortable level of difficulty. As for level 2, which has a problematic level of difficulty, the prize offered is a trophy. Determination of level 2 individual winners is by using the ranking of the highest scores that get the trophy reward.

Table 2. Reward

No	Types of Games	Level	Reward	Requirement
1	Planting rice	1	Book	Answer and gather tools for planting rice
		2	Trophy	The speed of time and how the number of rows that were successfully cultivated rice crops
2	Picking fruit	1	Stationery	Answer and gather tools to pick fruit
		2	Trophy	speed and accuracy of prediction of dense fruit plucked

4.2 Design smart gamification in village tourism

In support of the objectives of this study, the gamification proposed process described above needs to be illustrated by its application on smartphones see in figure 1. Following are the suggested ways to play for gamification village tourism based on mobile apps. In general, intelligent gamification is divided into three parts. First, prepare the game; second, team building; and third, competition and cooperation.

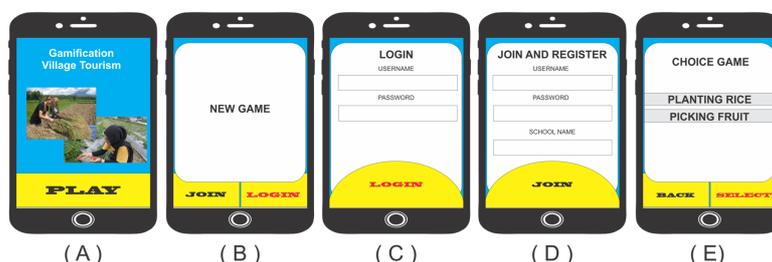


Fig. 4. Interface design for preparing the game.

This section displays the display when the user opens the application game village tourism. Figure 4 shows a part of prepare game that is an implementation of the proposed method (see figure 1). To play the game, the user must enter by entering a username and password. If the user has not registered, then the user can join to register for a new account. When registering, users are asked to write their username, password, and school name. After the user successfully enters into the system, then the user in selecting the requested games you wish to play. Two sets can be chosen by the user, namely planting rice and picking fruit (see figure 4).

After the user enters to eat a choice game page will appear (see figure 4E). This section is an implementation of figure 1 (build team). If the user chooses planting rice as the game to be played, the system will randomly build a team or group to proceed to the next stage after it is composed of 6 to 10 users, and between 2 to 5 users if the user chooses Picking Fruit (figure 5A).

The basic design (figure 5) is from the proposed method (figure 1), part of the team building. The system will determine the captain team randomly. The captain is in charge of validating the work of his team during the game. Then each user will be brought to the user page according to the random results of the group determination system and the user's role. There are two types of role users, namely captain mode and member mode. Each team has only one captain and many members according to the specified number of game users.

Captain mode: The captain page is briefly seen in figure 5. After the system is assembled, the system team will display the home captain page (figure 5A). This section is the implementation of figure 1 (competition and cooperation). In this case, there are several descriptions and menus. The menu consists of my team, maps, verify challenge, scan result teamwork, high score, my reward, and Logout (figure 5B). If the captain presses the lets play button, it will be taken to the maps page as a guide to the first mission. If it reaches the specified point, the system will open a video education view page like the member page to start the selected game see in figure 1 (level 1). The difference is that when the captain submits the challenge, the verify challenge page will appear. Captain has the task of being a member verifier if the problem has been implemented or not (figure 5D).

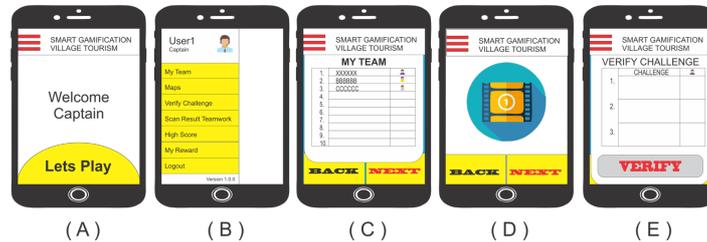


Fig. 5. Workflow Captain Mode.

After the captain verifies the next page, a map will appear to show the next place (Figure 6A). On this page, there is an open box button which is locked if it hasn't reached the specified point. The captain leads and directs the members based on the guide in the map see in figure 1 (Level 2 A and B). If users arrive at the destination, the system will open the open box containing the next command. Captain directs the members when they are ready, and then the captain presses the available button (Figure 6B). Members are required to complete the order within 1 minute after the captain presses the ready button. After 1 minute the system in the captain account will display the result teamwork scan page (Figure 6C). Captain scans precisely the work of his team, for the planting rice captain game to take photos at precisely what has been provided, while for the fruit picking game, the captain takes a picture of the fruit placed on a digital scale. The weight of the fruit must approach the weight as ordered. The weight tolerance in this system is less than 0.2 Kg. The system will identify the results with AI technology that has been built. After pressing the scan button, the captain will know the team's high score (Figure 6D). After the entire team completes the game, the system will open my reward page (Figure 6E). All users will get a level 1 reward, but only one side will get a trophy prize. Furthermore, the captain can claim at the village tourism information office.

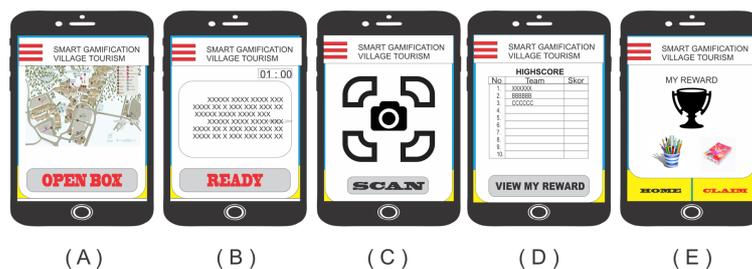


Fig. 6. Advanced Workflow Captain Mode.

Member mode: This section is a member page, briefly seen in figure 7. Almost the same as captain mode is the implementation of figure 1 (competition and cooperation). On this page, there are several descriptions and menus. The menu consists of my team, high score, my reward, and Logout (figure 7B). If a member presses the lets play button, it will be brought to the video education view page to start the selected game (figure 7D). After finishing watching the education video, members are asked to

complete the challenge following the instructions in each member account. After the member has finished carrying out the order, the member checks the list and submits it to the system so that the captain can verify the teamwork at level 1 (figure 7E).

After completing level 1, members continue to level 2 by following the captain's direction. Members and captains began to strategise to complete orders at level 2 correctly. Members occupy the area or position according to the instructions in the application see in figure 7F. If all members complete the task and the captain finishes verifying the member can access the team's high score update. After the whole group ends the game, the system will open my reward page. Furthermore, members can claim the office of the village tourism information section (figure 7H).

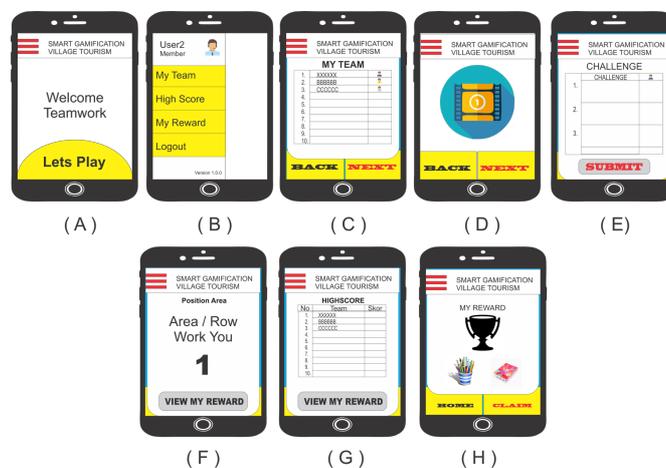


Fig. 7. Workflow member mode.

With the mobile-based gamification, community interest in visiting village tourism has increased. So users will be one of the pre-eminent promotions and attractions in developing a more modern and pleasant village tourism potential. The use of gamification based on mobile apps is considered very appropriate to instil knowledge about village tourism in elementary school students.

This gamification requires students to complete a farming mission in groups with their smartphone to get an Education in Agriculture. Rewards are provided as intensive so that students are more enthusiastic in achieving this mission. The findings of this study are rewards that are favoured by elementary school students.

In the future, the use of smartphones will be excellent in all daily activities. The tendency of students to smartphones will also increase. Mobile-based Gameplay is an appropriate medium for students to be interested in learning more about village tourism. The design of smart gamification village tourism and exciting features in the gamification application on smartphones can improve student motivation [23]. In the future, there needs to be an attack by adjusting the elements of advanced human and computer interaction suitable for elementary school students.

With so many similar studies on gamification can prove that gamification is an appropriate promotional media to motivate and attract tourists, especially elementary school children to learn life in the village in a fun way.

4.3 Research finding

The results of the above design have been made prototypes on Android using Android Studio. The design is made according to user requirements. In this study, we found that students would feel compelled to do something challenging if given a specific time limit. Then after we conducted a random questionnaire to several schools, we got the result that Indonesian students would prefer to get a trophy prize than others because there is a culture in Indonesia for displaying awards in a cupboard or shelf. Therefore the trophy is the first choice. This gamification is a game used to train teamwork. Then we did the development by making players around 6-10 people in one team to play rice planting and 2 to 5 students in one group in picking fruit.

5 Contribution

The contribution of this research is to motivate elementary school students to get to know rural tourism, especially about farming by smart gamification. This Gamification is based on mobile apps. Aside from being a promotional media for tourism, the village of gamification also offers prizes that are preferred by elementary school students. Determination of Reward, Amount per Team and time limitation are the contributions of this study.

6 Conclusion

Elementary school students prefer the trophy as the main prize when compared to smartphones, money etc. because it is following Indonesian culture that likes to display trophies in a cupboard or shelf in his house. With the time limit requires the right mindset of students in making decisions together so that the team wins. The formation of an appropriate group for the rice planting game is between 6-10 students and between 2-5 students in the fruit picking game. Gamification is a promotional media in attracting tourists to visit somewhere. In the future, this system concept can be carried out further research so that it can be applied to help the advancement of the idea of tourism, especially rural tourism and can help elementary school students learn activities related to farming, especially rice and fruit in a fun way.

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Article submitted 2019-08-14. Resubmitted 2019-10-04. Final acceptance 2019-10-04. Final version published as submitted by the authors.