

Design and Development of a Mobile Persuasive Game on Code of Conduct awareness for Eco-Park Visitors

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Abstract - The study was conducted primarily to help Panguil River Eco-Park (PREP) located in the province of Laguna, Philippines to reduce the negative impact of tourism through the promotion of conduct awareness with the use of mobile technology. This study was focused on developing a mobile persuasive game on code of conduct awareness for the visitors of the eco-park through the use of the persuasive elements in captology. The developed mobile game application named “CoCo App” consisted of four areas: entrance, river, forest, and waterfalls which depict the areas found in the eco-park. Each area consisted of two mini-games which reflect the different activities and code of conduct implemented in the eco-park. In addition, a trivia was incorporated in every stages of the game to make the user aware of the history of the place. A total of forty-four respondents used the mobile game application and the results indicated that the respondents strongly agree on its usefulness attributes which consisted of questions on the awareness of the facts, nature, activities, and code of conduct present at the eco-park.

Keywords - Mobile Learning, Persuasive Technology, Code of Conduct Awareness, Ecotourism, Captology

I. INTRODUCTION

Promotions to raise awareness regarding the individual’s responsibility to contribute to a better and more sustainable world has increased and the demand for everybody to contribute and take small steps to reduce the negative impact of the things being done to our environment is being taken seriously. The tourism industry is quite aware of this fact thus the formation of Ecotourism which is an environmentally responsible tourism that involves travel and visitation to relatively undisturbed natural areas with the object of enjoying, admiring, and studying the nature (the scenery, wild plants and animals), as well as any cultural aspect (both past and present) found in these areas, through a process which promotes conservation, has a low impact on the environment and on culture and favors the active and socioeconomically beneficial involvement of local communities (Ceballos-Lascuran, 1983). Similarly, other studies considered that stakeholders have an immense impact on the environment such as local government unit, community and visitors; the local government unit (LGU) has the overall responsibilities for sustaining the needs of the ecotourism; the community is the one responsible for the rules and regulations to be implemented and to preserve its history; and the visitors have the influence to promote

ecotourism and as well as enjoying the nature at low impact on the environment (Ceballos and Lascuran, 1983) (Tacio, 2009) (Mowforth and Munt, 2009).

This study aimed to influence visitors of the Eco-park through the implementation of its code of conduct activities which are necessary to maintain the pristine condition of the place for sustainability. According to Kaufmann and Oinas-Kukkonen, “persuasive technology was used to change attitudes or behaviors of the users through persuasion and social influence, but not through coercion. Most self-identified persuasive technology research focuses on interactive, computational technologies, including desktop computers, internet services, video games, and mobile devices.” Although it has been around for a while, persuasive technology is becoming increasingly popular and profitable and based on the literature gathered and reviewed, persuasive technology is an effective tool to increase awareness on the environment and in other areas (Soler, Zacarias, & Lucero, Molarropolis, 2009) (Othman & Muhammad, 2011).

The conservation of nature’s beauty and transparency is necessary to maintain and make a better environment otherwise its beauty may be gone along with change of time from generation to another generation. Everyone has to learn or be educated on how to take care of nature especially those included in ecotourism. This study is intended to help Panguil River Eco-park in maintaining its magnificence by providing an answer on “*how to educate the visitors in taking care of nature through making them aware of the proper code of conduct in the Eco-park?*” Specifically, the objectives of the study are to develop a persuasive mobile game application that can be used by the visitors to learn: (1) the right code of conduct while exploring the different areas of the Eco-park such as river area, forest area, and waterfalls Area; (2) the do’s and don’ts while using the different activities at the Eco-park: water tubing, swimming, crablet fetching, camping, obstacle relay, bonfire; and (3) the facts and nature of

Panguil River Eco-park through trivia.

II. METHODS

The mobile persuasive game in the study used macrosuasion which was developed solely for the purpose of persuasion and it is under the design process of captology. According to Ma, Xiaojuan “captology is the study of interactive technologies that change a person’s attitudes or behaviors or both in various domains”. Fig. 1 shows the design process of Captology. The thought of combining game and ecotourism also benefits its own development as the literature in (eduweb, 1996 - 2013) as it provides scenarios in which the player becomes aware of the things that are to be expected on what to do in a certain area.

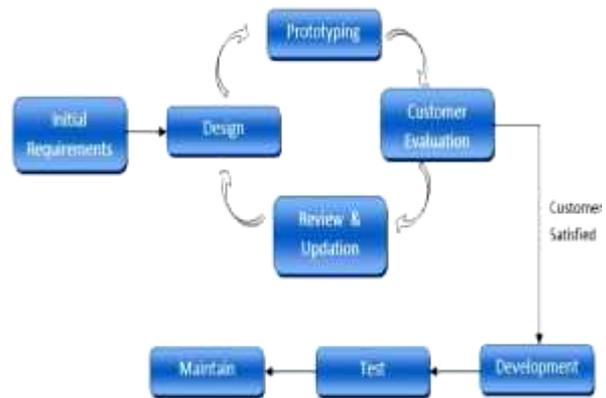


Fig 1. Design Process of Captology

A. Initial Requirements

A review of the areas, activities and behavior of the visitors in Panguil River Eco-Park (PREP) was made through an interview with the tourist guide and general manager. The interview focused on knowing the different areas and activities held at Panguil River Eco-Park and the behavior of the visitors in line with the code of conduct and rules and regulations at PREP. The review produced a broad definition of the game components in terms of the functionality of the games. The deliverables of the *Initial Requirements* stage is an outline game structure, the scope and limitation of the game.

B. Design

The design stage consisted of detailed analysis of the Panguil River Eco-Park areas and activities related to the proposed prototype. Action diagrams are created. Given the analysis, the prototype procedures are designed and preliminary layouts of screens are developed. This phase is continuous interactive levels that allow users to be aware, familiarize, and eventually a working game structure that will change the behavior of the users in line with the code of conduct at the Eco-park.



Fig 2. Screenshot of the Main Menu



Fig 3. Screenshot of Camping Area Game



Fig 4. Screenshot of the Forest Area Game



Fig 5. Screenshot of Main Menu for River Area Game



Fig 6. Screenshot of Game Tutorial



Fig 7. Screenshot of the Eco-Park Rules & Regulations



Fig 8. Screenshot of River Area Game Showing Reminders on how to be Safe while Rafting



Fig 9. Screenshot of River Area Game Showing Reminders on not what to do in the Area

C. Prototyping

The software construction process consists of a series of “design and build” steps in which the users have the opportunity to fine-tune the requirements and review. The deliverable of this stage includes documentation and instructions necessary to operate the new application, routines, and procedures. In addition, the prototype was developed using an IDE for Java which are Eclipse and SDK Manager.

D. Customer Evaluation

A continuous change in the prototype and survey was done. The first prototype is modified, based on the comments supplied by the users, and a second prototype of the new system was constructed.

E. Review and Update

Involves collecting and analyzing the remarks from the users, noting the strengths and weaknesses, what needs to be added, and what should to be removed. With the help of the user’s remarks, updating the prototype was easier.

F. Development

Through the use of iterated steps, designing then making the prototype, prototype to users for evaluation, evaluation to reviewing and updating, and going back to the first step. The prototype development gain insights of the user needs until satisfaction met that lead the development into a success. Also, it involves the implementation of the prototype by dealing with the objectives determined by the interview and uploading it to Google play store.

G. Test

This is a process where the prototype is to be implemented across multiple platforms for testing. A usability acceptance questionnaire was developed and the questions are focused on the following: usability concerns, pleasing and enjoyable attribute, visual design, and usefulness attributes. Usability concerns consisted of questions whether the mobile game application provided clear instructions, convenience on the use of game controls, and user friendliness of the game. Pleasing and enjoyable attributes consisted of questions on how engaging, enjoyable, and attractive is the game. Visual design attribute pertains to the audio visual representation, screen lay-out, device and game user interface, indicators visibility, and terminologies used. Usefulness attribute refers to how the game was able to provide facts and nature, activities and areas, and code of conduct at the eco-park.

III. RESULTS AND DISCUSSIONS

The usability testing was conducted in Panguil River Eco-Park which is the locale of the study. The total number of respondents that participated during the user acceptance testing phase has a total of forty- four respondents. The data below shows the total mean of each criteria of the usability testing. As shown in Table I, the results indicated that the prototype functioned as it should have.

TABLE I
USABILITY TESTING RESULTS

Criteria	Mean	Verbal Interpretation
1. Usability Concerns Pleasing and Enjoyable	4.11	Agree
2. Attributes	4.03	Agree
3. Visual Design	4.07	Agree
4. Usefulness Attributes	4.35	Strongly Agree
Overall Mean	4.14	Agree

Pleasing and enjoyable attribute has the lowest mean which indicated that the game is somehow short of the expectation of the users of the game. Visual design attribute can still be considered low in terms of the presentation of the game. The Usability concerns attribute

has the second highest mean over all of the criteria which indicated that the respondents had a bit difficulty in playing the game and understanding the instructions on how to play the game. Usefulness attribute has the highest mean and is the most important criterion in the usability testing for it determines that the mobile persuasive game can be a tool to promote awareness on code of conduct for the visitors of Panguil River Eco-Park. The overall mean shows the competency of the prototype in which it is accepted by the respondents.

IV. CONCLUSIONS

The study aimed to develop a prototype that can serve as a mobile persuasive game application designed for the awareness of the code of conduct awareness for the visitors in the Panguil River Eco-Park in the Province of Pangil, Laguna, Philippines. The prototype consisted of a map with four levels which depict the four main areas of the Eco-park such as the Main Entrance, River Area, Forest Area, and the Waterfalls Area. The study was composed of three objectives which are to develop a persuasive mobile game application that can be used by the visitors to learn: (1) the right code of conduct while exploring the different areas of the Eco-park such as river area, forest area, and waterfalls Area; (2) the do's and don'ts while using the different activities at the Eco-park: water tubing, swimming, crablet fetching, camping, obstacle relay, bonfire; and (3) the facts and nature of Panguil River Eco-park through trivia. A User Acceptance Testing was conducted in a form of a survey to examine the response and reactions of the visitors while they are playing the game for the first time and the reaction of the personnel who already tested the prototype many times during the development period of the prototype. The results indicated the effectiveness of the mobile application prototype in being a mobile persuasive game for Panguil River Eco-Park since majority of the respondents are in agreement of its usefulness. It can also be claimed that the purpose of the prototype to be an effective tool has been accomplished and that it can be used

as a mobile persuasive game for the code of conduct awareness for the visitors of the Panguil River Eco-Park.

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(Arranged in the order of citation in the same fashion as the case of Footnotes.)

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