Chapter 7

Development of Gamification in Tourist Guide Application

Jocelyn Joyce Benjamin[1], Aslina Baharum[1*], Nur Shahida Ab Fatah[2], Farhana Diana Deris[3], Noorsidi Aizuddin Mat Noor[4]

[1]UxRL, Faculty of Computing and Informatics, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, MALAYSIA
[2]Faculty of Business, Economics and Accountancy, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah
[3]Faculty of Social Sciences and Humanities, Universiti Teknologi Malaysia, MALAYSIA
[4]UTM CRES, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Johor Bahru, Johor, MALAYSIA

aslina@ums.edu.my*

ABSTRACT

A static image is a non-interactive media. Non-interactive media is no need for communication or interaction done by humans. Interactive media refers to the conceptual interaction design, new media, interactivity, the interaction between persons and computers, digital culture, graphical user interface, interactive design, and virtual reality. An interactive system aims to help the user achieve the objectives from the application domain. The interactive media were instructional realistic, purposefully emotional involvement, and bridging learning tasks to social awareness in a ubiquitous learning environment. Interactive advertisement is effective in attracting users. However, there are many applications developed with non-interactive media, thus lose visitor's attraction. In this study, virtual reality (VR) is introduced into the system because VR represents an interactive computer-generated environment and allows users to create endless virtual interactions, both real and virtual. Besides, gamification is used to develop users' motivation to remain focused on the application in use**.** Therefore, the visitor will get unforgettable experiences when doing a tour in UMS.

Key Words: attraction, virtual reality, interactive, mobile

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Research & Design in Challenging Environment
MNNF Publisher. eISBN No: 978-967-18412-4-2 (Publication Date: 12 June 2021)

1.   INTRODUCTION

Gamification involves in business activities has become very valuable, has played a significant role, has been respected for users' generality, and has a positive impact on the gamified applications use. Gamification is characterized as a procedure of improving a gaming experience facility to assist users' overall value creation for service marketing. This concept emphasizes that gamification is two simultaneous objectives to provide gaming content and motivate the customer's perceived worth-in-use of the core service process (Huotari & Hamari, 2017). Besides, gamification is also known as an advanced tool that promotes the living of unforgettable experiences. Users take part productively and have positive effects (Miguel Trigo-De la Cuadra, 2019). Generally, gamification is used to define an interactive system or application characteristics that seek to inspire and motivate users using game elements. The possibility of gamification for the tourism industry is important across various applications and support functions. Visitors can experience challenges, rewards, storytelling, fantasy, competitiveness, roleplay and more by focusing on game design elements. In general, the travel gamification advantages involve both the external and inward functions of gamification. The outward function refers to the experience of the visitor before, during, and after the trip. Before the trip, tourism-specific games (online games; smartphone games) deliver visitor information to possible visitors, create interest, trigger visitor motivation, and increase awareness of the brand; These functions are assisted by Virtual Reality (VR) or 3D technology technical device. Meaningful tourism information converted to sales or purchases.

In conclusion, gamification and virtual reality have been chosen to be implemented in this project to create interactive applications. Gamification was chosen because it can motivate visitors to visit interesting places in the tour package and create a visitor experience. The interaction between these two perspectives results in an interactive game that meets the visitor's expectations and abilities. At the same time, VR uses interactive media such as 360-degree photos that allow viewers to explore places of interest. Besides, VR can create a game using the computer-generated 3D environment, called 'virtual environment' (VE), that the user can navigate and interact with. Therefore, this application is the solution for the issues mentioned in the problem background and problem statement. This project aims to identify the gamification elements for VR tourism on the mobile platform, develop an interactive VR Tourism mobile application for UMS visitors, and evaluate the usability of the developed application using the user experience method.

2.   LITERATURE REVIEW

During the trip, location-based games as an entertaining method will promote tourist interaction and improve on-site experiences. Gaming is an interactive tool to fill time. After the trip, games can remember memories, invite friends to share experiences, and support a destination. Rewards such as free or discounts vacations, foods, and entrance to places of interest can offer the motivation and challenge to proceed with the player's participation and encourage repetition visits (Xu et al., 2016, 2017a). The gamification inward function includes, in particular, the games use to familiarise the worker and the training programs use for workers, such as the Marriot Hotel (Xu et al., 2017b). However, gamification has its disadvantage and limitations. For example, it typically relates to younger generations, and the gamification effects may be context-specific. Careful design is required.

VR adds interest to the industry because customers appear to recall better experiences than traditional commercial ones. On the other hand, for tourism, VR plays an

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Research & Design in Challenging Environment
MNNF Publisher. eISBN No: 978-967-18412-4-2 (Publication Date: 12 June 2021)

essential part in attracting possible visitors to tourism. Some of the advantageous VR applications happen when manipulation, visualization, and interaction with info are essential to its considerate; besides, its ability to enable users to view and communicate with info and the world that some think is the most significant benefit of VR. Three apps were reviewed. All three apps also provide tourism VR applications to let the user know the application's attraction places. Each reviewed application had its unique functionality that has distinguished between all three of these applications. Table 1 shows the comparison between the three reviewed VR tourism applications. From this reviewed VR application, Sites in VR and Orbulus only provide 360-degree photos on the place of interest and can use cardboard to view the place of interest. In contrast, Egypt VR provides the VE of the place of interest to interact with the user. Thus, the proposed project should 360-degree photos and VE to allow the user to interact within the place of interest.

Table 1: Reviewed VR Applications

Functionality	Sites in VR	Orbulus	Egypt VR	Proposed project
View in the 2D interface	/	X	/	/
View in VR interface	/	/	/	/
View 360-degree photos	/	/	X	/
Walk Around the VE	X	X	/	/
Interaction with Object	X	X	/	/

3.   METHODOLOGY

The methodology chosen for this project is the waterfall model. There are five phases to achieve the three objectives of this study. Phase 1: Initial Planning, the current UMS EVIC system's used as a problem study to understand this proposed system's purpose. The target users for this project mainly UMS visitor or who interested to visit UMS. Phase 2: Analysis, the literature review on gamification, virtual reality, and interactive as a guide later in the project development. The functional and non-functional requirements are defined to contribute to a successful project. Phase 3: Design, in which the entity-relationship diagram, data flow diagram, and data dictionary are created and designed. The selected gamification elements are implemented and designed. Therefore, The design of the user interface is based on chosen gamification elements. Simultaneously, interactive VR games and 3D models were created and designed for the gamification design. Phase 4: Implementation, build and run the application as soon as it is made. The main reason is to focus on the overall feel of the virtual environment. Install the software application with the hardware and calibrating it for light conditions. Each user interface of the developed application is described. Phase 5: Testing, testing and debugging to evaluate the developed application's usability to make sure the application works well.

4.   RESULTS AND DISCUSSION

The literature reviews are done on Gamification, VR, and interactive. Based on the literature reviews, various gamification types, that apply in the tourism industry. From reviewed existing gamification applications, mostly the implementation of gamification elements are reward and point. The Hexad model is adopted to identify the suitable gamification element. It suggests a list of suitable gamification elements based on specific user type motivation.

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Research & Design in Challenging Environment
MNNF Publisher. eISBN No: 978-967-18412-4-2 (Publication Date: 12 June 2021)

Five modules include the view tour packages, playing VR games, viewing rewards, redeeming, and contacting us. Figures 1 to 6 show the application's interfaces. In the main menu (figure 1), there are five buttons, when the user taps on the 'EVIC TOUR PACKAGES' button, the system will change to the package menu, as shown in figure 2. In the package menu, the user chooses the desired package to know about the tour packages provided by UMS EVIC. After selecting the desired package, the system will move to the desired package menu. The 360 interesting place interface has a 360 photo in which the user can rotate 360 the phone to view the photo. The 360 interesting place interfaces also displayed the interesting place's name and consists of next, previous, and return icon buttons. When the user taps on the 'VR GAME' button, the system will enter the game menu. It consists of four buttons which the user can choose any interesting place to play the VR game (figure 3). Figure 4 is an example of an interesting place VR game interface. There are four conditions after the end of playing VR games: the user did not get any reward points when the user collects less than 300 points in the VR game, 75 reward points when the user collects more than 500 points, 50 reward points when the user collects more than 400 points. In my reward point interface, the user can view the reward point collected and tap on the 'REWARD' button to view the redeem reward interface, as shown in figure 5. The redeem reward interface consists of a list of reward types, images, and points needed to collect for redeeming the desired reward displayed (figure 7).

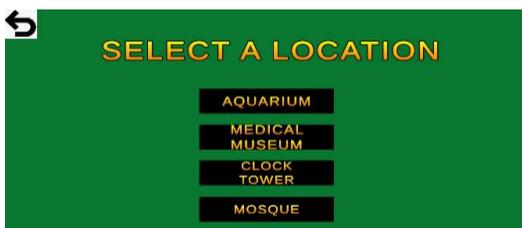Figure 1: Main Menu.

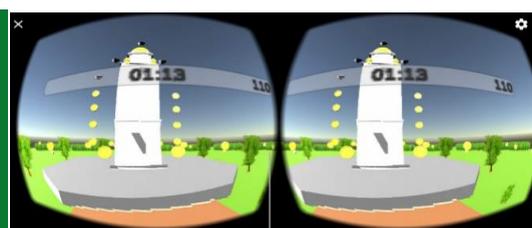Figure 2: Package Menu.

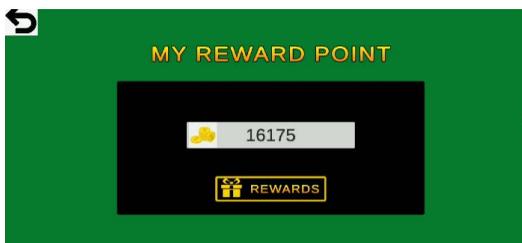Figure 3: Game Menu.

Figure 4: Clock Tower VR Game Interface.

Figure 5: My Reward Point Interface.

Figure 6: Redeem Reward Interface.

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MNNF Publisher. eISBN No: 978-967-18412-4-2 (Publication Date: 12 June 2021)

5. CONCLUSION

The study allows the person who wants to visit UMS EVIC to get to know the UMS EVIC tour package by viewing the package's information and the 360 photos of interesting places. The implementation of gamification useful for UMS EVIC tourism, which attracts the UMS EVIC visitor to use the application and increase the UMS EVIC visitor in the future. Future work should focus on efficiency, dependability, and novelty. Items of efficiency are fast or slow, inefficient or efficient, impractical or practical, organized or cluttered. Items of dependability are unpredictable or predictable, obstructive or supportive, secure or not secure, meets expectations or does not meet expectations. Items of novelty are creative or dull, inventive or conventional, usual or leading-edge, conservative or innovative. These three scale items need to improve to make the developed application be an excellent business software category.

ACKNOWLEDGEMENT

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