JURNAL PENDIDIKAN TEKNOLOGI KEJURUAN

Vol. 4, No. 3 August 2021 **P-ISSN: 2621-3273**
E-ISSN: 2621-1548

Planning of the digitalization promotion system at the Colo Muria tourist site in Kudus Regency

Ira Siti Mayashofa and Putri Khoirin Nashiroh*

Universitas Negeri Semarang, **INDONESIA**

*Corresponding author: putrikhoirin@mail.unnes.ac.id

https://doi.org/10.24036/jptk.v4i3.21023

Abstract—Tourism is a multidimensional activity that can show the identity of tourist attractions, one of which is the Colo Muria Tourism object which has local charm and wisdom that can be visited by tourists. This study aims to plan a digitalization system at the Colo Muria tourist attraction, Kudus Regency using Augmented Reality technology. The research method used is agile development. The steps of this research are Planning, Analysis, Design, Implementation, and Testing. Application testing using alpha testing in the form of functional testing (black box testing), portablity testing and beta testing in the form of usability testing (media expert tests and application user observer tests). The alpha test that tested the functionality aspect using the black box test showed that the application was running well and as planned. Beta testing was carried out by media experts and the percentage results were 80%. From these results, it can be seen that the digitization system at the Colo Muria tourist attraction has good capabilities, so it can be declared worthy of being used as a means of tourism promotion. For beta testing using the respondent test, the final average score is 79%, so it is included in the acceptable or feasible criteria for use. Suggestions put forward for further research are to add better animated travel videos and 3D object animations so that the Colo Muria tourism object digitization system is more complete.

Keywords: *System, Digitization, Promotion, Tourism, Augmented Reality, Android, Agile Development*

I. INTRODUCTION

Tourism is a multidimensional activity that can show the identity of the tourist spot. Colo Muria is one of the tourist attractions that is very worth considering to stop by both domestic and foreign tourists. Geographically, the religious tourist spot of Sunan Muria's tomb is located in Colo Village, Dawe District, Kudus Regency, Central Java. The area of Sunan Muria Tomb is indeed a special attraction for the Muslim community. It has potential and local wisdom that can be visited by tourists, but the terrain to get to this destination is quite heavy so that visitors feel afraid if they are going to visit it.

With the development of Colo Tourism, tourists can not only make a pilgrimage to the Tomb of Sunan Muria but can also rest or even stay overnight, exercise or heal in the Park with family by enjoying the scenery and natural coolness of the Muria Mountains. Colo Tourism is one of the leading tourist attractions in Kudus Regency. The area consists of religious tourism, nature tourism, culinary tourism and typical Colo souvenirs including the following: The Tomb and the Mosque of Sunan Muria, Colo Ria Park, Montel Waterfall, 3 Flavor Spring, Gentong Water of Sunan Muria's Legacy, parijoto fruit, pamelo oranges, pomegranates, horn bananas and jangklong which are crops that are used as unique souvenirs of Colo Muria.

The area of Sunan Muria's tomb in Colo Village is indeed a special attraction for the Muslim community. The location of Colo Muria Tourism still lacks information about the history, facilities, location or information on existing attractions. The information on the internet has not fully described the details of tourist information, especially the Colo Muria tourist attraction.

The form of tourism development continuously promotes potential tourist attractions, one of which is religious tourism which is developed more optimally, for this reason it is necessary to have information media about Colo Muria attractions so that tourists

can find out information related to the explanation of attractions in Colo Muria.

Development carried out by utilizing science and technology (IPTEK) through planning a promotional digitalization system at Colo Muria tourist attraction. The development of technology is very rapid, especially smartphone technology. This is because people like to receive information or news from smartphones compared to other media. This is evident from the Indonesian Digital Association (IDA) research reported by techno.okezone.com, which wrote that the percentage of smartphone users reached 96% while other media such as television 91%, newspapers 31% and radio 15%.

Smartphone technology that can be utilized as a medium of information or promotion is Augmented Reality (AR). Augmented reality in general is a technology that can display an object both 2D and 3D in the virtual world to the real world in real-time (Azuma, 1997). Augmented reality is a combination of the virtual world and the real world created by computers. Virtual objects in the form of text, animation, 3D models or videos are combined with the actual environment so that users feel virtual objects in their environment (Hari and Hendrati, 2018).

Digitalization systems in the form of Augmented reality (AR) technology can be used as a medium for conveying information about these tourist sites. AR technology can help the tourist attractions visited be more familiar when tourists visit these attractions. In addition to using AR as an information medium, AR can also be used as a promotional medium with innovative, creative and interactive forms.

The interactive form of AR promotional media allows users to be truly involved, thereby directly creating a relationship with the user. Augmented Reality was developed as part of tourism information media to provide information about the destination of the tourist attraction and show its potential to become a new tourism service (Chung, et al., 2015). This digitization system uses Unity 3D to build the interface and Vuforia as an engine to analyze markers and bring up 3D objects. The results of the application of AR technology are interesting and efficient because users can see objects virtually in the form of 3D graphics so that it is as if the object is in the real world with the help of a mobile phone with an android operating system (Rifa'i et al., 2014).

From some of the above descriptions, the digitization system is an optimal promotional solution using Augmented Reality (AR) technology. The creation of this digitization system media is expected to display tourist attraction information in the Colo Muria area of Kudus Regency, so that the delivery of tourist attraction information fully describes the details of tourist information. The objectives of the research conducted are to:

1. Carry out the process of creating a Promotion Digitalization System at the Colo Muria Tourism Object in Kudus Regency.
2. Testing the Planning Results of the Promotion Digitalization System at the Colo Muria Tourism Object in Kudus Regency.

II. METHODS

A. Time and place of implementation

This research was started from June 2020 to August 2021. The research location was carried out in the Colo Muria tourist area, Dawe District, Kudus Regency and Universitas Negeri Semarang.

B. Research design

The software development model used in this research is Agile Software Development. The process of this software can be seen in Figure 1.

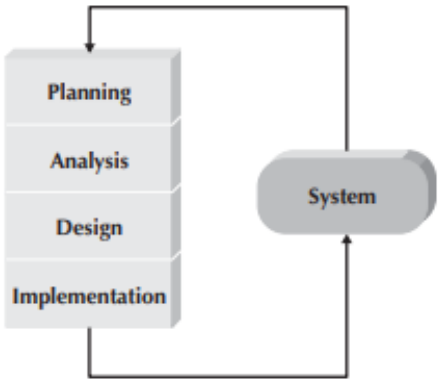

Figure 1. Agile Development

The stages of the procedure used in planning the Colo Muria tourism promotion digitalization system to become an application product include: planning, analysis, design, implementation, testing.

1. Planning

The digitization system focuses on the suitability of 3D visualization of Colo Muria tourism in Kudus Regency which can explain the description of information about several Colo Muria attractions in terms of destination places and souvenirs.

2. Analysis

This analysis stage is an identification of digitization system planning needs such as tools and

materials needed before making applications can be met. The needs of tools and materials can be seen in table 1.

Table 1. The tools and materials

No.	Tools and materials	Specification
1	Laptop	Intel Core i5, RAM 8GB, SSD NVMe
2	Unity Hub	Unity 2018.4.26f1 (64-bit)
3	Android Studio	android-studio-ide-193.6626763-windows
4	Corel Draw X7	2.0
5	Blender	Blender-2.82-windows64
6	Microsoft Office	2013 (64-bit)

3. Design

The process of making this Augmented Reality application design is carried out, including the design of the Use Case Diagram display and application display design.

a. Use case diagram

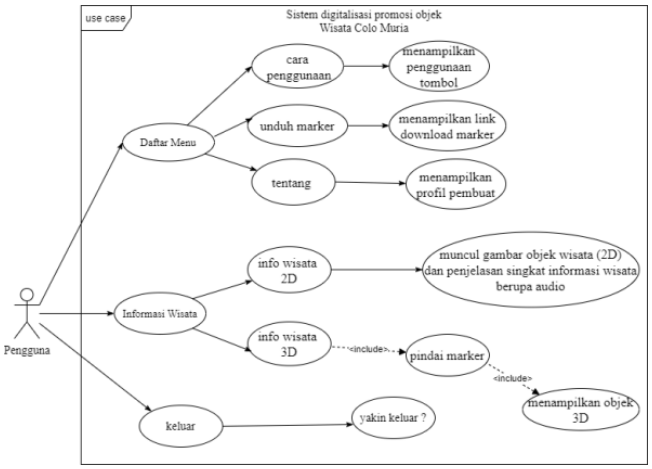

Figure 2. Use case diagram application

b. Media display design

Interface design or user interface is a stage of making a display design that is very important in the development of application-based information media. In this stage, the layout of each button, title, material and components in the information media is described.

4. Implementation

The design of destination objects and crops or souvenirs typical of Colo Muria in 3D form is applied in the form of Augmented Reality technology. Augmented Reality application design that has been determined. Writing code on this Augmented Reality application using Unity Hub version unity 2018.4.26f1 (64-bit) which is already equipped with vuforia and combined using android studio to build it into an android application. Implementation of Augmented reality applications in the form of writing code and making displays according to application design. The marker method will be used in this study because it is based on the many existing studies that the marker method is more effective and better if used for promotional media (R. A. Setyawan and A. Dzikri, 2016).

5. Testing

The purpose of testing is to find errors in the system so that they can be corrected. After the planning of the digitalization system for the promotion of Colo Muria tourist attraction is complete, it needs to be tested, the testing carried out is alpha testing using black box testing and beta with feasibility standards according to ISO 9126 which has six aspects, namely Functionality, Reliability, Usability, Efficiency, maintainability, Portability. In this research on the planning of a digitalization system for the promotion of Colo Muria tourist attractions, the aspects tested are Functionality, Usability, and Portability.

a. Alpha testing

Alpha testing is testing done by looking for errors in a system that focuses on the functional requirements of the software created (Setiawan et al., 2016: 32). Alpha testing is declared successful if the application runs well so that the application can be tested at a later stage (Prabowo et al., 2015: 53). Alpha testing is done with Black box testing which focuses on the suitability of the application. Black box testing only observes the results of the execution of the application created, so the focus of this test is on functionality testing (Suryanto et al., 2018: 36).

b. Beta testing

Beta testing is carried out to determine the extent of the quality of a system that is made, whether it meets expectations or not (Setiawan et al., 2016). Beta testing conducts research on material experts and application user observers (Respondents) where

it is not controlled and involves the developer again (Pressman & Maxim, 2015).

C. Research parameters

This research is determined from media validation by media experts on the aspects of functionality, usability, and portability as well as testing of System Usability Scale (SUS) users. Media validation in this study used a questionnaire. The questionnaire was given to experts in the field of software engineering, while the System Usability Scale (SUS) testing target was the management of Colo Muria objects and Colo Muria tourists both who had visited and who had not.

D. Data collection techniques

The data collection technique in this study used a questionnaire. The questionnaire or questionnaire itself is a data collection technique in which respondent participants fill out questions or statements then after being filled in completely return them to the researcher (Sugiyono, 2017: 216).

E. Data analysis techniques

1. Alpha analysis technique

Alpha testing is done with Black box testing, the analysis used is the Guttman scale as an instrument measure, where the measurement scale with this type will get a firm answer 'successful-no" (Sugiyono, 2017).

2. Betha analysis technique

a. Media validity testing analysis

In the analysis of the validity of this media expert, it is calculated using a Likert Scale as a measurement instrument, where the answers to each instrument have gradations from very positive to very negative. According to Sugiyono, (2017: 165). The following scoring guidelines can be seen in table 2.

Table 2. Likert scale on the answer score

Answer	Score
Strongly Agree/Very Good	4
Agree/Fine	3
Disagree/Not Good	2
Strongly Disagree/Very Poor	1

The results of the data from the questionnaire that has been converted with the Likert Scale are then calculated by summing, comparing with the expected number and obtaining a percentage.

$$\text{Percentage} = \frac{\text{Score obtained}}{\text{Maximum score}} \times 100\%$$

The percentage that has been known, then classified into the assessment criteria seen in Table 3.

Table 3. Feasibility percentage scale

Score	Criteria
81,25% > score ≤ 100,00%	Very Feasible
62,50% > score ≤ 81,25%	Feasible
43,75% > score ≤ 62,50%	Less Feasible
25,00% ≥ score ≤ 43,75%	Not Feasible

b. System Usability Scale (SUS) analysis

The analysis carried out on the results of the SUS instrument uses a Likert scale as a measurement in the instrument, in this type of measurement the answer to each instrument item has a range of differences from very positive to very negative (Sugiyono, 2017: 165). The SUS (System Usability Scale) Questionnaire Score Range can be seen in table 4.

Table 4. SUS Questionnaire score range

SUS Score Range	Criteria
<50	Not Acceptable
50-70	Marginal
>70	Acceptable

III. RESULTS

The results of the research that has been carried out include the results of the promotional digitization system in the form of tourism promotion media using Augmented Reality technology and validation of the media that has been made so that it can be used at Colo Muria Tourism in Kudus Regency.

A. Initial page

When entering the digitization system, the opening sound of the Colo Muria Tourism object digitization system appears.

Figure 3. Initial page

B. Home page

The home page has two main menus. The first menu is a menu list button which contains how to use, download markers and developer profiles, while the second menu is tourist information which contains tourist information in 2D and 3D form.

Figure 4. Home page

C. 3D object display

3D objects in the Colo Muria tourism promotion digitization system were created using the Blender application as shown in Figure 5.

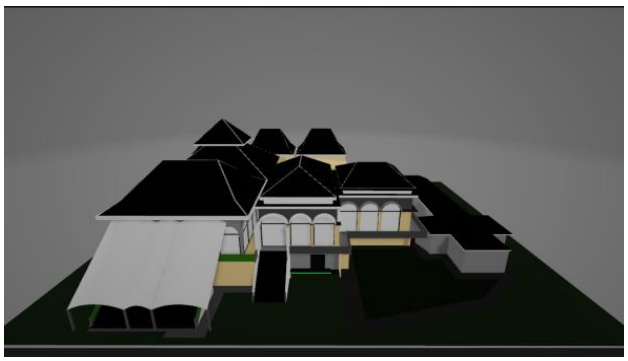

Figure 5. 3D object display

The final process in creating a Digitalization System application is building the application in Unity 3D on Android so that the application can be tested directly and used on Android devices.

IV. DISCUSSION

The final process in creating the digitalization system application is building the application in Unity 3D to Android so that the application can be tested directly and used on Android devices.

A. Alpha testing

Alpha testing is more focused on the functionality aspect by using black box testing to determine whether the application created is in accordance with what was planned or not. This test was carried out using the Oppo A5 2020 smartphone by testing 12 test scenarios. From the results of testing 12 test scenarios, 12 were declared successful, with a percentage of 100%. Based on these results, it is stated that all menus, functions and buttons in the application can be used properly and no errors are obtained because all buttons and scenes function properly.

Black box testing in the form of portability testing is also carried out by installing and running this application using several Androids with different OS and processor versions, namely Nougat, Pie and Android 10. From the results of these tests, the calculation percentage results were 100%. From these results, it can be concluded that no errors were found and the application runs smoothly when used on several Androids with different versions.

B. Beta testing

1. Media validity

Media validity testing tested by the assessment is divided into 3 aspects, namely the Functionality aspect, the Usability aspect, and the Portability aspect resulting in a percentage of media expert validity feasibility obtaining a percentage value of 80%, so it can be concluded that the digitalization system for promoting Colo Muria tourist attractions is declared very feasible.

2. SUS (System Usability Scale) testing

SUS testing is carried out to determine the feasibility of the digitalization system according to users. This test also uses a questionnaire as its media, with 40 respondents who have visited or have never visited the Colo Muria tourist attraction. Testing is carried out by observing users in using the digitalization system, and then the questionnaire is filled in by users according to the observations made.

After testing, the percentage results with 40 respondents obtained 79%. From this figure, it can be

concluded that the usability aspect test is declared "Feasible".

V. CONCLUSION

Based on the results of the research and discussion that has been conducted regarding the "Promotion Digitalization System at the Colo Muria Tourist Attraction in Kudus Regency", the following conclusions can be drawn:

a. The Promotion Digitalization System at the Colo Muria Tourist Attraction in Kudus Regency based on Android uses Augmented Reality technology and has been successfully created using the agile development method which is divided into several stages, namely planning, analysis, design, implementation, and testing. In making the background and buttons using Adobe Photoshop and Adobe Illustrator software. For making characters and buildings using Blender 3D software, and all finished materials are built into a complete application using Unity Game Engine and Vuforia.
b. Alpha testing which tests the functionality aspect using black box testing shows that the application runs well and according to plan. Beta testing is carried out by media experts to determine the quality and feasibility of the application based on the functionality testing aspect, usability aspect, and portability aspect. Based on the assessment of media experts, the percentage result is 80%. Where the Functionality aspect is 86%, the Usability aspect is 78%, and the Portability aspect is 80%. From these results, it can be seen that the digitalization system at the Colo Muria tourist attraction has good capabilities in displaying tourist attraction information in digital form in an attractive manner, so that it can be declared suitable for use as a means of tourism promotion. For beta testing using the respondent test, the final average score was 79%, so that it falls into the acceptable criteria or is suitable for use. The results of user responses show very positive results, so it can be seen that the quality of the application in displaying information is very good and users are interested in using the digitalization system at the Colo Muria tourist attraction.

REFERENCES

Azuma, Ronald T. (1997). A Survey of Augmented Reality. Presence: Teleoperators and Virtual Environments 6 (4): 2,356.

Chung, N., Han, H. & Joun, Y. (2015). Tourists' intention to visit destination: Role of augmented reality applications for heritage site. Computers in Human Behavior.

Hari F, Diansari O. (2018). Pemanfaatan Augmented Reality Untuk Pengenalan Landmark Pariwisata Kota Surakarta. 12(1):7-10.

Prabowo, R., Listyorini, T., & Jazuli, A. (2015). *Pengenalan Rumah Adat Indonesia Berbasis Augmented Reality Dengan Memanfaatkan KTP Sebagai Marker*. Prosiding SNATIF, *2*(2), 51–58. https://doi.org/10.1145/2656433

Pressman, R. S., & Maxim, B. R. 2015. *Software Engineering: A Practitioner's Approach, Eighth Edition. ACM SIGSOFT Software Engineering Notes*. https://doi.org/10.1145/1226816.1226822

R. A. Setyawan dan A. Dzikri. (2016). Analisis Penggunaan Metode Marker Tracking Pada Augmented Reality Alat Musik Tradisional Jawa Tengah," Simetris J. Tek. Mesin, Elektro dan Ilmu Komputer., vol. 7, no. 1, p. 295.

Rifa'il, Muhammad, dkk. (2014). Penerapan Teknologi Augmented Reality pada Aplikasi Katalog Rumah Berbasis Android. Prosiding SNATIF.

Setiawan, E., Syaripudin, U., & Gerhana, Y. A. (2016). Implementasi Teknologi Augmented Reality Pada Buku Panduan Wudhu Berbasis Mobile Android. *Jurnal Online Informatika (JOIN)*, *1*(1), 28–33.

Sugiyono. (2012). *Metode Penelitian Kuantitatif Kualitatif dan R&D.* Bandung: Alfabeta. Sudaryono, Untung Raharja Suryo Guritno. *Theory and Application of IT Research-Metodologi Penelitian Teknologi Informasi*, 1st ed. Yogyakarta: Andi, 2011.

Sugiyono. (2017). Metode Penelitian dan Pengembangan (Research and Development/R&D). Bandung: Alfabeta. https://doi.org/10.1016/j.drudis.2010.11.005

Sugiyono. (2018). Metode Penelitian Kuantitatif. Bandung: Alfabeta.

Suryanto, A., Kusumawati, D. A., & Sanhoury, I. M. H. (2018). Development of Augmented Reality

Technology Based Learning Media of Lathe Machines. *Jurnal Pendidikan Teknologi dan Kejuruan*, *24*(1), 32–38. https://doi.org/10.21831/jptk.v24i1.18245