Mataram Cultural Tourism Model Based on Interactive Digital Tourism Map User Experience (UX)

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Abstract

This study aims to design a tourism navigation innovation using the Interactive Digital Tourism Map in the former Mataram Kingdom. This innovation is developing the Bantul Exploration tourism application, which is expected to become a tourism icon in Bantul Regency. This map is needed to provide comprehensive information for potential tourists. This map makes it easier for potential tourists to plan their trips through the information provided on this map. In the first stage, this research designs a prototype Digital Tourism Map. This article discusses the User Experience (UX) of this map. The method used is Expert Review, which asks an expert in application design to provide a review on this application. The results of the review state that this application has conceptually fulfilled the user's information needs. The available menus are also considered quite complete, which include (a) the location of tourism objects and the location of public facilities supporting tourism; (b) information in the form of content related to communicative and exciting tourism objects, (c) tourist travel paths from the starting point of tourists to tourism objects. However, the information material is still lacking and less attractive. It should be packaged in the form of a storytelling.

Keywords: *E-Tourism Map, Digital Tourism, UX.*

INTRODUCTION

President Joko Widodo has designated Borobudur as a super-priority tourist destination. This decision provides tourism opportunities for Bantul Regency as a buffer. The Bantul Tourism Office responded with a Mataram cultural tourism concept in the Kotagede-Pleret-Imogiri-Mangunan area. The area is connected through the history of Sultan Agung's journey when searching for his burial place.

Seeing people's behavior who are increasingly familiar with digital media, an innovation for digital-based tourism information transformation is needed. This article is the result of research that offers an interactive digital map of the Kotagede area.

The concept of integrating this historical tourist area will then be packaged in an interactive and innovative digital tourist destination. This is in accordance with the policy direction and strategy of the Ministry of Tourism and Creative Economy 2020-2024 point 6, namely encouraging research, innovation, technology adoption with a strategy of promoting research and innovation related to the development of creative tourism destinations that are oriented towards increasing added value and competitiveness as well as the adoption of information and communication technology. Up-to-date effectively and efficiently.

People are now accustomed to using smartphones for navigation (Padovani, et al., 2016[1]; Kos and Brchic, 2013[2]). Millennials prefer to watch TV with cellphones (Prabowo and Arofah, 2017[3]) Tourist attractions are promoted through the internet (Utami, et al., 2018[4]). Internet use for the Indonesian economy in 2019 increased by $40 Billion and is expected to triple by 2025 (Google Report, 2019[5]). Searching for Indonesian travel information via Google increased 39% in 2019 and Yogyakarta ranks 4th

in Google searches for the traveling category. Tourism can no longer rule out Technology 4.0 (Korze, 20196; Stankov and Gretzel, 20207; Panfiluk, 20198)

The current tourism problem is the navigation system and information related to historical and cultural values which are still manual. Traditional navigation systems such as paper maps or directional signs are no longer practical in this digital age. Historical and cultural information related to the Kotagede - Mangunan area is also not presented in a system that makes it easier for tourists. If the navigation system and historical and cultural related information are packaged into an electronically based tourist map, it contains: 1) a web-based navigation system that is used to inform history and culture; and 2) a digital-based tourist map application for mobile devices that provides various functions, including: a navigation function that directs users to the tourist attractions of Kotagede - Mangunan correctly and quickly, 3) the function of historical and cultural information from the nearest tourist attraction in the Kotagede Tourism Area - Mangunan to plan the next stop and 4) route recommendations to a series of attractions. This study aims to integrate three aspects of one technology: Geographic Information System (GIS) technology. This study aims to: 1) Create a Digital Interactive Tourism Map that contains visuals and historical information on historical tourist attractions in Mataram from Kotagede – Pleret – Imogiri – Mangunan, 2) Increase tourist visits while transmitting historical value through interactive virtual technology innovations, 3) Helping the Bantul Tourism Office program to build the tourist area of Mataram, 4) Improving the economy of the tourism object management community and the surrounding community, 5) Digitizing tourism in Bantul Regency.

LITERATURE REVIEW

Digital Interactive Tourism Map

Tourists as customers of a tourism activity carry out several stages or processes before they arrive or are at a destination. There are three processes that tourists do when determining their trip to travel, namely before purchase (prepurchase), consumption (consumption) and after consumption (postconsumption) (Engel, Blackwell and Miniard, 20129). In the first process, prospective tourists will identify and evaluate a tourism product or travel package plan offered. From this process they will look for various things related to the products and services they will get when they are going to travel. At this stage, potential tourists will seek and obtain information related to meeting their needs when deciding to become tourists. In the second stage, tourists have purchased a tour service package based on the information that has been obtained (Kozak and Decrop, 200910). Tourists will experience or gain experience of tourism activities in a tourist destination. At this stage, various activities and events will be followed or experienced by tourists who are part of fulfilling their needs as tourists. In the third stage, tourists have completed their activities as tourists by starting the process of evaluating the information obtained before buying tourism products or services. This evaluation stage is closely related to whether tourists get services in accordance with what has been conveyed through searching for product and service information. Positive impressions and recommendations to family or colleagues will be given when tourism services match the information obtained. On the other hand, negative impressions can arise when tourists have an unpleasant experience or their needs are not met. The three processes above suggest that the right, fast and accurate tourism information system can be a determinant of whether tourists buy a tourism product or not. Hyde (2012) suggests that tourists will look for a variety of information related to their travels, especially those related to transportation, accommodation, and activities while at the destination.

Currently, tourists will use various media including online media to get information according to their needs. One of them is by using an interactive digital tourism map (Digital Interactive Tourism Map). An interactive and digital-based tourist map will be a bridge in accessing the information needed. If a potential tourist destination is able to provide accurate information with the convenience of tourism services with a digital system, then potential tourists can decide to buy the product. The Digital Interactive Tourism Map provides information about the presence, location, distance, existing travel routes based on digital technology (Manitchalermchai, Chotsawasraksa, and Vittayakorn, 2020)11. Digital Interactive Tourism Map has important functions: providing information to users (tourists) about the location of tourist objects, facilitating travel to tourist sites, assisting in information on the choice of tourist areas to visit, and planning trips. The content on digital tourism maps can be described as follows: geographic areas, attractive tourist locations, transportation services, supporting facilities and tourism services. In addition, the categories of information contained in the Digital Interactive Tourism Map are: Accommodation, Cultural Features, Entertainment, Facilities, Recreation, Services, Transportation, Unique Features, and Conditions for tourists.

Geographic Information Systems (GIS)

Geographic Information System (GIS) is a system that takes advantage of the advantages of spatial data and defines its relationship to information. This information can be in the form of the location of an area, office address, and other information, which is stored in a database. An important part of GIS is data retrieval and storage. Spatial data from the data taken must be provided validly. Spatial data storage is usually in vector form, where the data stored is in the form of points, lines, and certain areas. Map display or presentation includes various forms from printed maps to maps on mobile devices (Irwansyah, 2013: 1)12

The reason for developing a Geographic Information System navigation application for tourist destinations in Mangunan is based on Android using the Waterfall method, apart from being easy to apply, this method has advantages when all system requirements can be defined entirely and correctly at the beginning of the project, so application design or development can be done. running well and without problems. However, the disadvantage of using this method is that the next stage cannot be carried out properly when one stage is blocked.

User Experience (UX)

User experience is a person's perception and response to the use of a product, system, or service. User Experience (UX) assesses how satisfied and comfortable a person is with a product, design, and service. A principle in building UX is that the audience has the power to determine their own level of satisfaction (customer rule). No matter how good the features of a product, system, or service, without the intended audience being able to feel satisfaction, rules, and comfort in interacting, the UX level will be low.

The development of the digital and mobile world makes UX more complicated and multidimensional. Now a person can access a website from various devices. UX design is also experiencing expansion, because the experience in a device will be different from other tools. Accessing the web from a desktop computer will be different from accessing the same web via a smart phone. Likewise, the digital media that is displayed is increasingly diverse with the presence of social media. However, in terms of content delivery, a brand must issue the same language in various channels and media.

Jesse James Garett Model UX

Garrett divides his diagram into 5 processes, namely: the strategy plane, the scope plane, the structure plane, the truss plane, and the surface plane. The strategic plane becomes the platform for the formation of an experience blueprint. Here are formulated all the objectives to be achieved from the process of forming the experience, both in terms of user needs and communication producers.

The scope field stage asks what are the limitations in creating user experiences. In this field, Garrett divides it into two sides, namely: the software interface (content) and the hypertext system (context). On the context side, functional systematics must be considered. Meanwhile, on the content side, information needs must also be carefully considered. Scope boundaries must also come from various related departments such as marketing, sales, supply chain, IT, and so on. Some products require some information such as: product description, reason for purchasing the product, product benefits, shopping cart for e-commerce purchases, payment methods, and so on. In each scope, certain requirements are needed, for example: in the product category, product specifications, product photos, product colors, and so on are required.

The structure plane stage is the stage of making the information structure so that communication goes in the expected order. This stage can also be referred to as the stage of making information architecture. The thing that needs to be considered in the formation of the information structure is that it must refer to the ease of customers in accessing information. To describe the structure of information can be presented in a flowchart. In this stage the interaction with the user must also be determined. For example, how users move from one information to another easily without getting confused.

The skeleton plane stage is like making a draft layout where the information structure has been applied to the layout but not yet in the final visual display. In the world of visual communication design, this stage is making a grid layout and placing text in it. Accuracy in placing information on communication media is the basis for whether or not the information hierarchy can be conveyed.

The surface plane is likened to the final polish that gives tone and manner to the visual appearance. Here we consider design elements and principles such as motion, color, harmony, and so on.

Garrett's model is a linear model where one process must start if the previous process has been completed.

David Armano Model UX

David Armano, Executive Vice President of Global Innovation & Integration at Edelman Digital, a leading digital agency put forward an interactive experience model. While Garrett's model emphasizes structure, interaction, and usability, Armano's model takes a few steps back in the search for user insight. Armano divides the process into 5 steps, namely uncover, define, ideate, build, and design.

Uncover is the search for something fundamental from the motivations and interests of customers, businesses, brands, which are connected with understanding technological insights. In seeking customer insight, various research tools can be used, such as behavior mapping, social trends analysis, and so on, to find rational and emotional models of the intended audience.

This define stage is the stage of formulating strategies for the formation of audience experiences. This stage is similar to the strategy plane stage in Garrett's model. The purpose of this stage is to provide inspiration and direction to both the internal team and the client.

Ideate is a stage of collaboration and exploration. In the world of creativity education, it is often also called the process of emphatising, namely the process of understanding audiences by entering their world and acting as them. Then look for the most appropriate approach for the audience according to the purpose of communication. Build is the process of creating a Big Idea and trying to make it happen through

prototypes. The prototype is tested and improved through research to the audience. The design process is the process of finalizing and executing the prototype that has been tested. All functions and interactions are maximized in this process.

Usability as a Basic Concept of User Experience

The concept of usability is the basic concept of user experience. UX concepts are tested by users based on this usability principle. Often the concept of usability is juxtaposed with the word user friendly and other terms such as computer-human interaction (CHI), human computer interaction (HCI), user-centered design (UCD), man-machine interface (MMI), human-machine interface. (HMI), operator machine interface (OMI), user interface design (UID), human factors (HF) and ergonomics. Usability and utility form usefullness (Grundin, 1992). While usability questions how well the user uses a function, utility questions whether a function sticks to its principles. Usability applies all systematic aspects of human interaction including installation procedures and maintenance procedures.

According to Nielsen (1993), usability has several components, namely learnability, efficiency, memorability, errors, and satisfaction. Learnability is a system that is made to be easy to learn so that users can quickly work with the existing system. Learnability is assessed based on the level of proficiency versus time and can be recorded in the form of a learning curve.

Efficiency means that a system must be efficient to use so that high productivity values are possible. Memorability means that a system must be easy to remember (or able to remember), so that an ordinary user can return to using it after some period of time without having to relearn everything from scratch. Errors means that a system should have a low error rate so that the user makes the smallest possible error and if someone makes a mistake, can correct it immediately or go back to the previous step. Satisfaction is that a system must be pleasant to use so that users subjectively feel happy or comfortable.

RESEARCH METHOD

The software development method used in this research is a prototyping research method. The prototyping steps begin with requirements gathering, involving system developers and users to define the purpose, functionality, and operational requirements of the system. The steps in prototyping are as follows:

1) Collection of Requirements. In system development, it is necessary to determine initial requirements such as analyzing ideas and ideas to build a system. Analysis is also needed to find out the components running on the system

2) Fast design process for building prototypes. At the design stage, the researcher finds out how the system will fulfill the objectives for which it was built. The result of system design is in the form of system specifications which can be in the form of interface, process and data design concepts with the aim of producing system specifications according to needs.

3) Evaluation and improvement by testing the system with its users (User Experience/UX). At this initial stage, UX testing is carried out using the Expert Review method. The expert who was asked for a review was Heroe Rustamaji, an Informatics Engineering lecturer with experience as a Developer.

FINDINGS AND DISCUSSION

A map is a description of a geographic area, a part of the earth's surface that is presented in a variety of different ways, from conventional printed maps to digital maps that appear on a computer screen. Maps can be drawn in a variety of styles, each showing a different surface for the same subject, to visualize the world in an easy, informative and functional way.

Computer-based (digital) maps are more versatile and dynamic because they can show many different views on the same subject. This map also allows for scale changes, combined animations, images, sounds, and can be connected to additional information sources via the internet. Digital maps can be updated to new thematic maps and may add other detailed geographic information.

Starting from an initiative to make innovations in presenting an integrated digital map to develop tourism sites for the Ancient Mataram Kingdom, the Ancient Mataram Kingdom Site Tourism Digital Map contains a database with data needs to be displayed such as info on natural attractions, cultural tourism, recreational tourism, historical tourism, special interest tourism, culinary tourism, art tourism attractions, hotel locations, lodging places related to tourism of the ancient Mataram kingdom site. The data is displayed in the form of a map or an interactive map, with certain coordinates containing information, photos, videos, annual travel calendars and other useful media.

This Digital Map of Ancient Mataram Kingdom Site Tourism synergizes location information with data belonging to the Bantul Regency Tourism Office, namely the "Explore Bantul" application (see Figure 1) and data belonging to other related agencies. Digital Map of Ancient Mataram Kingdom Site Tourism is a website-based mapping application that is integrated with several GIS features (tools) that present mapping data and layers of tourism objects/activities/facilities in supporting tourism in the Special Province of Yogyakarta.
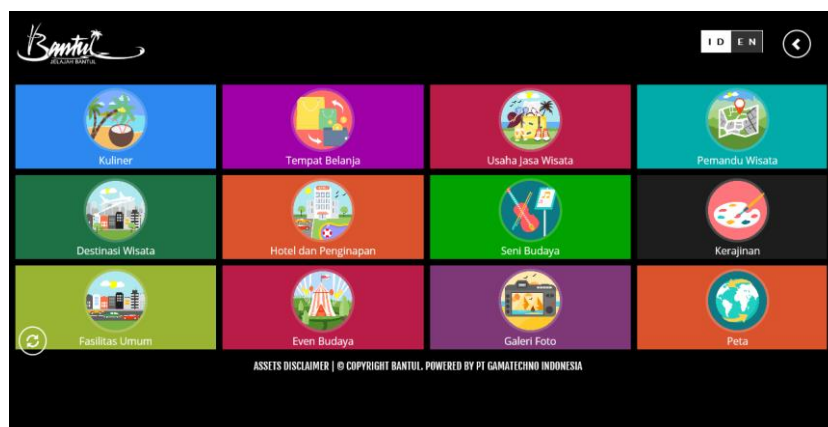
In terms of transparent data presentation as a form of service effort to the community, and of course the public can also seek information related to the location of tourist objects contained on digital maps. With this media, it will be easier for the Government and the wider community to find information, analyze and make decisions in determining regional tourism.

Digital Map Specifications

Hardware Requirements

The web application will be optimal if it is opened by a personal computer/notebook with a super VGA monitor layer, 4 Gigabyte memory, minimum available hard disk space of 1 Gigabyte, and equipped with adequate peripherals (mouse, touch pad, soundcard, and also network interface card/wifi).

Software Requirements

In principle, this web application can be opened on all devices that can access the internet. The software requirements for permanent devices are:
a. Operating system: Microsoft Windows 7/8/10, LINUX
b. Browsers: Chrome, Mozilla Firefox, UC Browser, Internet Explorer, and Chromium
Internet Connection Needs

An internet connection is required by the web application during operation and the android application during the installation process and updating information. Internet connection is expected to use HSPDA, 3G or 4G networks. Optimizing the appearance and performance of the application is expected to use an internet connection of at least 1 Mbps. If it is less than that, it is certain that information updates will run slowly and even stop at all. Therefore internet connection is very crucial in all types of web applications. However, this can be overcome, especially if the user is in the Special Region of Yogyakarta, generally all areas are covered by high-speed internet
User Terms

a. Admin status user. Users with admin status have access rights to register other users with operator status. The manager will manage the access rights of the operators and also delete the operators if they are no longer on duty. The requirement to become a manager is to understand the web system and how to operate it as understood by the operator.
b. User status Operator. Operators are in charge of managing the web, namely adding data, editing data, deleting data as follows:
(1) Tourist attraction data
(2) Data on tourism support facilities
(3) Data of cultural arts performances
(4) Other complementary data
Operators must have the ability to edit the image to be uploaded to the web. The image to be uploaded must be edited in terms of: image quality (must be good), image size (must be small), and appropriateness/compatibility when the image is displayed on the web.
c. General users. General users have an interest in viewing and opening the web. So there are no requirements to become a general user.
*Sidebar Menu on Digital Map Dashboard*
The Digital Map Sidebar contains a variety of WebGIS menus as well as side menu views on a typical web page. Various menus in WebGIS contain menu options or general information on Tourism WebGIS that you want to display. The following are various menus for the Bantul Regency Tourism WebGIS.

1)   Digital Map WebGIS Content

The WebGIS content includes a map of Bantul with supporting information available. The existing supporting information displays the name of the tourist attraction and its coordinates. The following is the content of WebGIS Tourism in Bantul Regency.
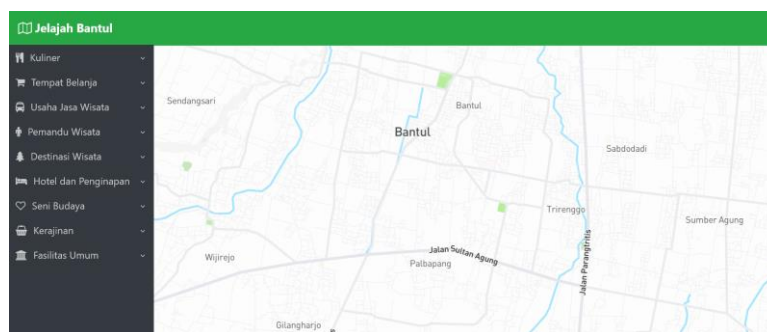
2)   Culinary Place Sidebar

The Culinary Sidebar displays a map with coordinates and information on culinary objects/places and souvenirs in the Bantul Regency area. On the culinary map, tourists can display information in the form of photos and information on culinary places based on the selected coordinates on the map.

3)   Shopping Sidebar

The shopping sidebar displays a map with coordinates and information on shopping places in the Bantul Regency area. On the map where shopping can display information in the form of photos and information on where to shop based on the coordinates selected on the map.

4)   Tourist Village Sidebar

The Tourism Village Sidebar displays a map with coordinates and information on tourist villages in the Bantul Regency area. On the tourist village map, tourists can display information in the form of photos and tourist village information based on the selected coordinates on the map.

5)   Artificial Tourist Destinations Sidebar

The Sidebar of Artificial Tourist Destinations displays a map with coordinates and information on artificial tourist destinations in the Bantul Regency area. On the map of artificial tourist destinations, tourists can display information in the form of photos and information on artificial tourist destinations based on the selected coordinates on the map.

6)   Sidebar of Nature Tourism Destinations

The Natural Tourism Destinations Sidebar displays a map with coordinates and information on natural tourist destinations in the Bantul Regency area. On the map of natural tourist destinations, tourists can display information in the form of photos and information on natural tourist destinations based on the selected coordinates on the map.

7)   Hotel and Lodging Sidebar

The hotel and inn sidebar displays a map with coordinates and information on hotels and inns in the Bantul Regency area. On the hotel and lodging map, tourists can display information in the form of photos and hotel and lodging information based on the selected coordinates on the map.

8)   Cultural Arts Sidebar

The arts and culture sidebar displays a map with coordinates and information on art and cultural objects/places in the Bantul Regency area. On the arts and culture map, tourists can display information in the form of photos and information on places of art and culture based on the selected coordinates on the map.

9) Craft Sidebar

The Craft Sidebar displays a map with coordinates and object/place information for craftsmen in the Bantul Regency area. On the craft map, tourists can display information in the form of photos and craft center information based on the selected coordinates on the map.

10) Public Facilities Sidebar

The Public Facilities Sidebar displays a map with coordinates and information on public facilities supporting tourism in the Bantul Regency area, such as: government offices, hospitals, police stations, places of worship, and gas stations. The map of public facilities in the form of government offices can display information in the form of photos and information on government offices based on the selected coordinates on the map. The map of public facilities in the form of government offices can display information in the form of photos and information on government offices based on the selected coordinates on the map.On the map of public facilities in the form of police stations and places of worship, you can display information in the form of photos and information on police stations and places of worship based on the selected coordinates on the map.On the map of public facilities in the form of gas stations, you can display information in the form of photos and information on gas stations based on the selected coordinates on the map

User Experience (UX) of Interactive Digital Tourism Map

This application is based on the analysis of user needs. This can be seen from the menus that are displayed. Usually, a survey is carried out to the user or to the customer for the application for mapping. The application content shows that this map is a map based on GIS data (spatial data). A survey is needed to find out the purpose of this application and what features are needed. Meanwhile, for the metadata needs of tourist destinations, usually related to culinary, shopping, tourist services, hotels and so on are well presented. In mapping the types of tourism objects, such as object names, locations, coordinates have been designed as needed.

Another important thing is application design. The design includes the first interface features. If an application is connected to another application, it must be ensured that the connected application has the appropriate information load. This digital map is connected to Google Map. From the aspect of need, Google Map is the main menu. Information on tourist locations on this map is quite complete, but still needs to be improved in routes and road classes that lead to tourist sites. Meanwhile, the process design which includes the search feature, is quite good. This is related to data collection and database design. All required information is stored in the database. Judging from the information content that is not yet complete, the information stored in the database still needs to be added.

Digital Map of Ancient Mataram Kingdom Site Tour

Some of these criteria are Useful (useful), Usable (used), Desirable (desirable), Findable (can be found), Accessible (accessible), Credible (reasonable) and Valuable (valuable).

1) Useful:

I feel that the Digital Map of the Ancient Mataram Kingdom Tourism Site has been good as a tourist information medium in the form of a digital map. The information obtained from the digital map helps me to decide which tourist attractions I want to visit. Therefore, I think this Digital Map is very useful for obtaining tourist information.

The Digital Map of the Ancient Mataram Kingdom Tourism Site is different from just the information on the website. I feel that with this digital map I get complex knowledge in the form of travel affordability from a position.

2) Usable:

Digital Map of Ancient Mataram Kingdom Tourism Site in operation is easy to use. The features of the Ancient Mataram Kingdom Site Travel Digital Map which consist of culinary locations, shopping places, tourist service businesses, tour guides, tourist destinations, hotels (lodging), arts and culture, crafts and public facilities are quite complete and easy to understand.

3) Desirable

Based on the results of use, the Digital Map of the Ancient Mataram Kingdom Tourism Site is very comfortable when used. I got the content of the Ancient Mataram Kingdom Tourism Digital Map based on the selected option. I can easily find the location of public facilities in tourist attractions by clicking the public facilities button which will then be displayed in the form of a map.

4) Findable

Based on the results of the use made, to find the content or features contained in the Digital Map of the Ancient Mataram Kingdom Tourism Site is quite easy. Digital Map of Ancient Mataram Kingdom Site Tourism uses the search box to find the desired tourist attraction.

5) Accessible

To be able to access the Digital Map of the Ancient Mataram Kingdom Tourism Site, an internet connection is required. It becomes a problem when using digital maps in locations that are not accessible to the internet. Digital Map of Ancient Mataram Kingdom Tourism Sites does not require high internet speed, in use with low internet speeds, digital maps can still provide the information you are looking for, but can look longer.

6) Credible

To use the Ancient Mataram Kingdom Tourist Site Digital Map, I am not required to log in. Digital Map of Ancient Mataram Kingdom Tourism Sites, the security level is considered to be not good, this is because there is no security process found at login

7) Valuable

Digital Map of Ancient Mataram Kingdom Tourism Site is quite useful. With the menu contained on the digital map, it makes it easier for tourists to find out tourist objects based on tourists' desires (the one they like, the closest one, or the most complete one).

Ancient Mataram tourist area is quite wide. The scattered objects make it difficult for tourists to identify locations that need to be visited. Conventional information tools are not sufficient to meet the information needs of tourists. The content contained in each object also needs to be packaged into a media that is more simple and informative. The answer to this need today is an innovation of digital tourism maps.

The problem is to build this kind of application is not cheap. The local government in this case admits that it does not have the resources to build it. The tourism application owned by the Bantul Regency Government is currently a third party donation. Like other applications, this interactive digital tourism map is also a researcher's contribution to the Regional Government.

This reason makes the development of this interactive digital tourist map cannot be directly made according to needs. The development is gradual depending on the grant obtained by the researcher. The development is in accordance with the priority needs. Even though this map is planned to be the main layer in the 'Explore Bantul' application, the survey process for data collection itself requires quite detailed time and effort. Therefore, the process of developing this interactive digital tourist map will take quite a long time to become perfect.

CONCLUSION

An interactive digital tourist map is an application that is suitable for information media for tourist attractions in the former Mataram Kingdom. This tourist area covers a fairly wide area. In addition to many objects that are close together, the artifacts of the Ancient Mataram Kingdom are intertwined with each other. Through an interactive digital tourist map, this area can be displayed in a single image that includes all of its information content. Both in the form of locations, pictures, historical information, and the path to

reach the location. In this map it is also possible to provide other tourism supporting information such as souvenirs, culinary places, houses of worship, homestays, police stations, etc.

So far, the development of this informative digital tourist map for the Kingdom of Mataram is only in the prototype stage. However, the results of the User Experience (UX) test conducted by asking for reviews from experts in application development are considered to have met the technical rules and user needs. The stages of action have been passed correctly. The features displayed are also good. The design of both the process and the interface has been built neatly. Only the content is considered still minimal.

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