



Design of Virtual Gallery Museum R.A Kartini Jepara Through the Mobile Learning Approach

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Abstract. The R.A Kartini Jepara Museum is a museum which is established for documentation and exhibition of the relics of R.A Kartini. Currently, youth generation are less concerned about it and almost never visit to that place, because of a lack of knowledge about the figure of R.A Kartini especially her ideas and thought about education. This research aims to design a virtual gallery which presents the relics of R.A. Kartini through a mobile learning approach that optimize smartphone as a learning-based interactivity model, which combines text, image, audio and video elements so that the learning atmosphere is more interesting, easy to understand, and interactive. This research uses descriptive-qualitative method which is commonly used in social phenomenology. Data was collected through observation, interview, literature, and the production process from the concept stage to the final design. Researchers hope by applying a virtual gallery through mobile learning approach, it will be more dynamic, more value, and easier to understand for education.

Keywords: Gallery · Kartini · Mobile Learning · Museum · Virtual

1 Introduction

The R.A Kartini Jepara Museum is a museum built on area of 5,210 m² specifically to perpetuate the services of R.A Kartini's struggle, which is located in Jepara, Central Java. This museum has three unique buildings in the form of the letters K, T, and N which form the word Kartini. Inside the building contains the presentation of the Museum's collection space which is divided into four, namely: Room 1: R.A. Kartini & Family, as well as objects and photos when she was alive. Room 2: Ancient Jepara, contains a presentation of historical and archaeological objects found in the Jepara area. Room 3: Dar Oes – Salam, contains objects left by Kartini's sister, namely RMP Sosrokartono. Room 4: Famous Jepara handicrafts such as Troso ikat, woven bamboo and rattan.

The R.A Kartini Museum apart from being included in the general museum category, is also used as a historical tourist attraction and educational tour. When COVID-19 pandemic occurred two years ago, this was closed to anticipate the transmission of the virus. Now, in mid-2022 this museum has been reopened while still observing health protocols. Korasbernas.id stated that the interest of tourists visiting the R.A Kartini

Museum in Jepara was relatively low. Whereas during the colonial period, the thoughts of R.A. Kartini, which is synonymous with women's emancipation, succeeded in changing the mindset of the Dutch community towards indigenous women who were considered old-fashioned. Her writings also became an inspiration for W.R Soepratman to compose a song entitled 'Our Mother Kartini'. R.A Kartini's ideas and thoughts can be shared on to the millennials that is adapted to the current era.

Based on observations at several junior high schools in Semarang City regarding R.A Kartini, researchers can conclude that: 1.) Some students only knew about R.A Kartini figure but did not know about her ideas and thoughts 2.) Kartini's birthday on April 21 which is commemorated as Kartini Day only interpreted by wearing a kebaya for teachers and female students. 3.) Teachers who teach about R.A Kartini still use conventional methods so that they are less relevant and in-depth 4.) The students have not used smartphones or gadgets to get to know R.A Kartini further.

To anticipate those problems, last year the R.A Kartini Jepara Museum designed museumkartini.id, a website which presents the legacy of R.A. Kartini. From observation activity, it can be concluded that this website content is good but the appearance is still simple and only dominated by photos and text. It needs to be a touch of multimedia so that it can create an interesting and interactive virtual gallery of the Museum so that it is familiar for millennials. Quinn Clark [1] explains that "Learning is the intersection of mobile computing and elearning: accessible resources wherever you are, strong search capabilities, rich interaction, powerful support for effective learning, and performance-based assessment. E-learning independent of location in time or space.". Learners and mobility of learning". Meanwhile, Ariesto Hadi Sutopo [2] explained that mobile learning is learning that uses mobile devices such as PDAs, mobile phones, laptops and other information technology equipment for learning. Mobile learning in smartphones or other gadgets can be used as the best alternative to introduce R.A Kartini's ideas and thoughts to millennials.

Learning media can be developed on mobile devices that are easy to carry anywhere such as smartphones and tablets [3]. Development of Android-based Mobile learning media in science subjects for junior high school students [4]. By synergising with the Ministry of Education, Culture, Research, and Technology, teachers and students can be persuaded to access museumkartini.id which has been updated using a mobile learning approach. By this way, it is hoped that the virtual design of the R.A Kartini Jepara Museum gallery using a mobile learning approach can increase students' curiosity and interest in R.A Kartini's learning, and then teachers get some advantage of this platform in classroom learning.

2 Theoretical Review

2.1 Virtual Gallery

The term virtual gallery is often used in the era of the Internet of Things (IoT), as something that can be considered new stuff. In fact, the concept of a virtual gallery is actually not a new thing in the creative field. To understand this, it is necessary to first understand the meaning of gallery and virtual separately. Galleries are inseparable from work exhibition activities, which are usually used in the fields of art, design, architecture,

and so on. Galleries are a place to be creative, accommodate visual communication activities as well as become a bridge between creators and community through exhibition [5]. Moreover, the function of the gallery can be maximized to present works of art, display public activities, as well as special activities that are still related to exhibitions including curation, discussion, and so on [6].

Based on the above statement, it can be understood that the gallery is a physical place for showing creative works. On the other hand, galleries in a city or educational institution have a limited number, including the size of the room [7]. This has prompted the virtual-based galleries, namely virtual exhibition spaces that are accessed digitally using smartphones or notebooks. This virtual term refers to virtual reality (VR) which is a digital-based gallery development platform in the computer world. In the creative field, virtual is translated as a technology that allows users to interact with the environment in the computer world [8]. The advantage of this technology is that it can be used to bring the real world into the virtual ones and provide an imaginative environment which allows real time interaction between users and devices.

It can be concluded that a virtual gallery is an imaginative place/environment designed to present virtual, real-time, and digital-based exhibitions. The virtual gallery can be accessed directly using a computer, notebook, or smartphone, and can also be accessed using an additional device, namely a VR head mounted.

2.2 Mobile Learning

The term of mobile learning is familiar in education field. Definition of mobile learning is very diverse and different depending on point of view (PoV) [9]. Initially, mobile learning was understood as a technology used as a learning device such as PDA phones, smartphones, and other mobile devices. This term then made a shift in the aspect of mobility, which led to a form of learning in a place that was not fixed or moved. It shows that the orientation of mobile learning is no longer focused on the device used, but rather on the characteristics of moving places. This term then shifts again to the learning side which utilizes mobile devices as a means. Finally, the definition of mobile learning is increasingly complex, focusing on implementation, namely activities that give individuals the freedom to be more productive when using, interacting, and creating information using mobile devices.

3 Research and Analysis Methods

The design of RA Kartini virtual museum gallery adapts Bryan Lawson's method, which is a direct design process to find solution problems around design based on the designer's experience [10]. This method consists of three stages, namely: Problem, Analysis – synthesis – evaluation, and Solution [11]. This was chosen because of compatibility which focuses on the existing problems to find the best solution. The first stage, namely Problem, focuses on presenting the main problems faced by designers from various points of view. The second stage begins with a needs analysis until conclusion on the various possibilities. The third stage, namely Solution, focuses on selecting the best solution to overcome the main problem that has been formulated (Fig. 1).

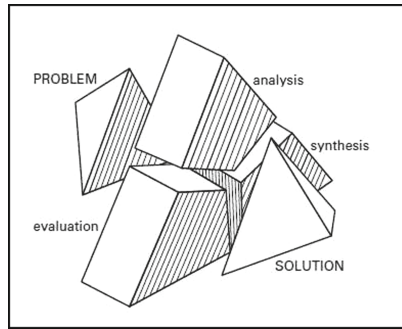


Fig. 1. Method of Bryan Lawson [10].

Table 1. The description of the virtual design concept of the RA Kartini Museum gallery

<p>PROBLEM</p>		<ul style="list-style-type: none"> • Museums in Indonesia, especially RA Kartini, are lack of visitors • Learning about history of RA Kartini mostly did through books, on the other hand, Indonesian’s interest of reading is very low • The advance of technology has not been adapting to present the history of the RA Kartini Museum as learning material • The world of education and museum are far behind the current trend about digital and IoT
<p>ANALYSIS – SYNTHESIS – EVALUATION</p>	<p>The urgency of product needs: product comparisons to present information on the content of the RA Kartini Museum as learning material</p>	<p>BOOK Strengths: formal in education and recognized for its validity Disadvantages: requires a high level of activity due to low student interest in reading</p> <p>AUDIO VISUAL Strengths: can tell visually and interestingly, the current trend is watching rather than reading Disadvantages: makes students passive, because they only watch and communication is one-way</p> <p>ONLINE MUSEUM Strengths: able to present 3D information like a real museum, interactive, can be accessed by anyone, anywhere and anytime Disadvantages: need a device and network to access the information in it</p> <p>From the comparison of the three products above, online museums have better advantages than others and are in accordance with current technological developments</p>

(continued)

Table 1. (continued)

	<p>Determining museum online product content: RA Kartini Museum information presentation techniques</p>	<p>Text only Pros: information can be conveyed in detail Cons: boring Picture only Pros: interesting, preferable to reading text Cons: ambiguous, tends to be polysemic Text – image Pros: informative and illustrative, can provide an overview Cons: requires a lot of page views to present information about the RA Kartini Museum Museum simulation (virtual) Pros: able to combine text, images, audio, interactive, and virtual tours that are almost like the original Cons: requires activeness to explore the content in it Based on the comparison above, museum simulations have great potential to introduce museums in an interactive and interesting way without compromising the completeness of the content that can be presented in them</p>
<p>SOLUTION</p>	<p>The resulting solution</p>	<p>Based on the method above, the solution chosen is an online museum in the virtual format of the RA Kartini Museum gallery through a mobile learning approach, which contains a variety of information in the form of text, images, audio, interactive, and virtual tours that represent the original place.</p>

The adaptation and implementation of the Bryan Lawson method in designing the virtual gallery of the RA Kartini Museum through the Mobile Learning approach are as follows Table 1.

The virtual concept of the RA Kartini Museum gallery with a Mobile Learning approach, is realized in the form of a website that can be accessed via mobile devices. It contains main information about the story of RA Kartini, artifacts in the museum, as well as virtual tours that can be accessed as if they were in a real museum environment.

4 Result and Discussion

Based on the research methods and data analysis above, the researchers formulate the concept of a virtual gallery which will be combined with mobile learning so that an ideal and dynamic learning model will be obtained. The designed virtual gallery will resemble 4 rooms in the R.A Kartini Museum Jepara, while the two outputs that will be produced are E-Catalogue in the form of.pdf files format and a virtual gallery. The

two outputs support mobile learning, while the concepts and technical approaches can be described as follows:

4.1 E-Catalogue

Digital Museum E-Catalogue is a collection list of a museum documentation centre which is organized according to a certain system with the output of a .pdf file format. The list is in digital form that can be accessed through notebook or smartphones, which contains information about collection and description in it. This product can be downloaded for free and also can be printed.

4.2 Virtual Gallery

The researcher designed the presentation in the form of a virtual gallery displaying the collections of the R.A. Kartini. Visitors can move between locations in the virtual gallery. On each part of the virtual gallery wall, photos of previous collections will be displayed. When a visitor interacts with the photo, a pop-up and narration will appear regarding the collection being displayed (Figs. 2, 3 and 4).

To adjust the target audience, the designed mobile learning must be fun, interesting, interactive, and entertaining. This is in accordance with the opinion of Tolstoy [12] who explained that fun learning is very necessary in the learning process because it is

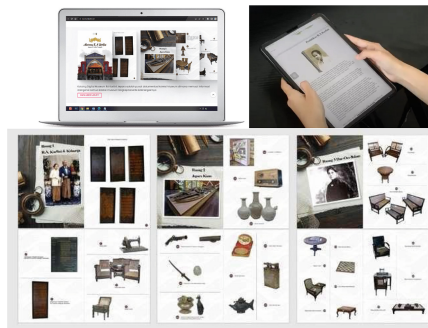


Fig. 2. E-Catalogue display on notebook and smartphone.



Fig. 3. Display of virtual gallery main page



Fig. 4. Display of virtual gallery menu (left: R.A Kartini & family's room, right: Sosorokartono's room)

Table 2. The Virtual Gallery

No	Features	Function
1	Zoom in dan zoom out	Zooms in and out of objects, so users can easily understand because they see Museum collections more closely.
2	Auto rotate	Activating the automatic rotation feature at an ideal speed so that users can feel the sensation of learning like visiting a real museum.
3	Full screen	Make the virtual gallery display appear in full screen mode so that the user's view will feel comfortable and spacious.
4	Gyroscope	This feature allows users to sense changes in direction and acceleration of rotation angle.
5	Museum floor plan and orientation	Make it easier for users to move to another room faster to get around with the help of a floor plan
6	Embed video	Show videos inside 360° photos
7	Pop-up	Displays text, image, and video information

very helpful for students to make learning materials meaningful, motivate learning, and provide learning satisfaction. Because fun learning will make children feel not burdened or forced to learn. Based on the reference above, the virtual gallery will be equipped with many features as shown in Table 2.

The seven features above are good enough to feel the sensation of learning with mobile learning because it adopts the development of smartphone and gadget technology. The simulation can be seen in the Fig. 5.



Fig. 5. Display of Embed video/pop up menu (left) dan features menu (right)

5 Conclusion

The design of R.A Kartini Museum virtual gallery through mobile learning approach, it is a form of learning media innovation aimed millennials to learn about R.A Kartini's ideas and thoughts, especially for women. By using smartphone platforms and gadgets, it will be easy to access anywhere and anytime. This virtual gallery has complete features so that any information related to R.A Kartini is easy to get on this platform. Suggestions for further research is to be able to update the increasing number of Museum collections, or update the current features that are liked by the younger generation.

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