



# Ergonomic Aspects of Display Design as an Effort to Revitalize Through Structuring Radyapustaka Museum Collection



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## Abstract

This study aims to design in terms of ergonomics, the display design of the Radyapustaka Museum collection as part of an effort to revitalize the museum's existence, covering several aspects of spatial planning, circulation patterns, elements of space, aspects of space fulfillment, including display systems and museum collection objects, layout safety factors, and aesthetic features that make up the atmosphere of a room. Radya Pustaka Museum was built on October 28, 1890, by Kanjeng Adipati Sosrodiningrat IV, Papatih Dalem during the reign of Paku Buwono IX and Paku Buwono X, where there are collections of ancient objects that have high artistic and historical value. Methods of data collection through observation, literature study, interviews, and documentation of artifacts, literature, and informants. The data analysis technique uses data collection stages, data reduction, data presentation, and concluding. This study uses a design thinking method that is tailored to the conditions and needs, namely: discovery, interpretation, ideation, experimentation, evolution, and implementation. The results of applied research are in the form of museum collection display designs that can increase safety and visibility for visitors and have the main objective of increasing the number of tourists.

## Keywords

*artifacts;  
discovery;  
display design;  
ergonomics,  
Radyapustaka museum  
Surakarta;*

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## Contents

Abstract.....	9
1 Introduction .....	10
2 Materials and Methods.....	11
3 Results and Discussions.....	12
4 Conclusion .....	13

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Acknowledgments.....	13
References .....	14
Biography of Authors.....	15

## 1 Introduction

As a cultural heritage, these precious ancient and historical objects should be a serious concern from the stakeholders involved in it. Can reconstruct the human presence's travel events from various aspects related to the development of civilization in the social and mental aspects of these multiple aspects chronologically by tracing and analyzing the ancient and historical objects that accompany them. The history of Surakarta's journey has left many historical pieces of evidence that have high-value content and are very meaningful for the journey of the next generation. As a reflection of the past with all related aspects, these artifacts must be in a museum that aims to preserve the benefit of the community. Therefore, to accommodate these matters related to ancient and historical artifacts, it is necessary to have a museum with elements of usual comfort and security.

With the existence of a museum that stores historical artifacts that function as educational elements, not all people left the cultural heritage of our ancestors in this era, despite the data condition, where the current young generation seems so indifferent and indifferent to their ancestors' legacy. There is an assumption that local culture is useless in today's world or other words, it is considered ancient and irrelevant in the development of modern life (Pujiono et al., 2020). Through the museum's authority in the term "national historical heritage", the museum becomes an institution that authenticates the identity of the nation in the past and projects it into the future (Tjahjopurnomo et al., 2011). Studying the Radya Pustaka Museum cannot be separated from the existence of the museum as a leading tourist destination in Surakarta. It is necessary to know the position of the museum in tourism which, according to its type, is grouped into three parts, namely: culture, nature, and adventure. Culture includes all human creations such as art (theatre, dance, music), handicrafts, festivals, museums, architecture, religion, health, etc. Nature in tourism is seen as all kinds of activities related to nature. The type of adventure that is more personal, where there is a combination of culture and nature, but added with a side of challenge and adventure (Prilosadoso, 2019).

The city of Surakarta has a museum called the Radya Pustaka Museum which was built on October 28, 1890 by Kanjeng Adipati Sosrodiningrat IV, Papatih Dalem during the reign of Paku Buwono IX and Paku Buwono X which is located on the Slamet Riyadi protocol road, Sriwedari Cultural Tourism Park complex, Surakarta. Furthermore, on the journey of time to coincide with January 1, 1913, the museum was moved to the Radyapustaka Museum Building on Jalan Slamet Riyadi Surakarta, once a Dutch citizen's residence named Johankes Bussellar. A statue of R. Ng Ranga Warsita can identify this museum icon. Ranga Warsita, a poet from the Surakarta palace who was very famous and lived in the 19th century, which is located right in front of the museum (Andriani, 2013).

The problem faced by the management of the Radya Pustaka Museum, Surakarta, Central Java Indonesia is that the safety factor aspect of the museum's artifact collection is that even though there has been an increase in the safety factor of the artifact collection at the museum, there have been several incidents where the loss of some high-value groups and historical elements in the museum people have stolen (Rupa, 2018; Little, 1999). Based on previous research, visiting a tourist attraction, society, or tourists has different motivations from one another. Tourist destinations have the primary purpose of refreshing or just tourism. The second objective is to increase knowledge and insight, and only a few visits with the motivation to know and learn, such as visiting a museum (Prilosadoso & Rosmiati, 2017).

Statistical data on visitors or tourists who visit based on data from the Radya Pustaka Museum contains data for the number of visitors during 2019, totaling 18091 visitors of local or domestic tourists totaling 17475 and visitors from abroad totaling 616 visitors. So from this data, it can be more detailed that 75% of visitors who dominate from kindergarten to high school ages, where the Radya Pustaka Museum is in demand and visited by students. According to Abraham Maslow, a psychosociologist in the Middle Ages, this museum's function and existence are related to human needs, explaining that these needs include security, physiological, social, respect, and self-actualization needs (Purnomo, 2010).

In this study's observation stage, several deficiencies reduce its function as a museum, where the shortcomings are from aspects that have not implemented acceptable safety standards and elements of comfort for tourists and museum managers. The deficiency is more in the display's design as a display for the collection of artifacts presented in the museum that has not been designed and meets the rules, one of which is the ergonomic aspect. Interior design, especially product display, must pay attention to the essential elements in it, such as reproduction, durability, construction, material efficiency, ergonomics, application of aesthetic technology, and comfort that refers to the segmentation of consumers or the targeted community. (Cornelius et al., 2010). The general aim of the designer is to design the product according to a known proportion of the intended user population; Ergonomics designers and practitioners aim to know the dimensions of some objects, such as furniture or workspace, sufficient to accommodate the range of levels of the population of individuals known to use those objects (Albin, 2017).

In studies written (Sanders & McCormick, 1993; Berg & Scherg, 1994), that there is an interaction between humans and the work environment, most studies show a clear relationship between effects on human performance (quality) and the environment such as lighting elements, sound, vibration effects, chemicals, and weather (Eklund, 1999). In spatial planning and design in the scientific field of interior design, it is inseparable from the aspects of space organization, circulation, spatial-forming elements, aesthetics, spatial conditions, where these elements can provide comfort and security for visiting tourists as well as for the collection of artifacts in the museum. This study is to design to emphasize design appreciation and design interpretation in the future (Purnomo et al., 2010). Therefore, this research will raise the display design from the ergonomic aspect to find the problems in the Radya Pustaka Museum arrangement concrete solutions.

## 2 Materials and Methods

This study will examine the extent to which the ergonomic aspects of display design are applied in the Radya Pustaka Museum so that the results in the form of a collection of artifacts are more organized and attract visitors through a qualitative descriptive research approach that is useful in this study—producing display design as a solution in answering the above problems. Qualitative research methods are used well in examining the details of the research subject (Turan, 2014).

Qualitative descriptive research for several reasons, namely: a). Researchers' natural conditions without engineering, where the research process can describe the process from time to time; b). An inductive analysis which contains exploration orientation, discovery, and inductive logic, so that theories and based on patterns in reality; and c) Description of human behavior in natural contexts (Nugrahani, 2012).

The data analysis technique uses data collection stages, data reduction, data presentation, and concluding. Design always attaches importance to tools for processing (data/information), subjects that are in the processing (problem), and processing (designer) stage. This study uses a design thinking method that adapts from some literature that goes through a development process according to the conditions and needs. This study uses a design thinking method that adapts from some literature that goes through a development process according to the conditions and needs (Sutanto & Tedjokoemo, 2017), like the following stages: a). Discovery; b). Interpretation, c). Ideation; d). Experimentation; d). Evolution; and e). Implementation. The data triangulation technique serves to use as a data validity test by triangulating the data source and theory. Test the data's validity using data triangulation techniques, namely, data source triangulation and theory triangulation (Prilosadoso et al., 2019). Data triangulation aims at the data validation stage using other things. The data analysis technique used an interactive cycle in stages, namely, data collection, data reduction, data presentation, and conclusions.

### 3 Results and Discussions

#### *Arrangement and design of display at the Surakarta Radya Pustaka Museum through ergonomic aspects*

The word museum's origin comes from the Latin word "Museum", which means a shrine to the nine gods Muses, the god Zeus's children whose primary duty is to entertain. Besides, the meaning of the museum can also be from the aspect of its activities. Over time, the museum's function from time to time changes according to the situations and conditions that accompany it, but in essence, the definition of the museum is essentially unchanged. While the definition issued by the ICOM (International Council of Museums), a museum is an institution that is permanent, not non-profit, serve the community and its development, is open to the public, obtains, cares for, connects, and exhibits for the study, education, and pleasure. Goods are proving humans and the environment (Asmara, 2019). Today, the museum can act as a cultural center, an information center, a center for socio-economic development, and a tourist destination. The museum, its history is inseparable from colonial-imperialism, where the importance lies in those who collect, who visit, and not those who are collected. Various objects from colonial areas were collected and transported to colonial countries, where they were later arranged, rated, and displayed. Of course, the functional values of these objects have been deprived of their original context.

The early history of this museum is located in one of the rooms in K.PA Sosrodiningrat IV in Kepatihan, namely Panti Wibowo so that this museum is private (private) and purely private. Then, on Paku Buwana X's initiative, the museum was moved to Loji Kadipolo on January 1, 1913. The Kadipolo Loji building, which is the museum's location, was currently purchased by Sri Susuhunan Paku Buwono X from a Dutchman, Johannes Buselaar for 65 thousand. Guilder with notarial deed 13/ VII 1877 number 10 land Eigendom. Radya Pustaka Museum in 1951 had a foundation, namely the Paheman Radyapustaka Surakarta Foundation. The Presidium carries out its day-to-day duties first noticed in 1966 by Go Tik Swan (K.R.T. Harjonagoro). This museum plays a vital role in storing various artifacts, also in the field of language (Java). After the seminar was attended by representatives of the Surakarta Palace, Yogyakarta, Mangkunagaran Temple, Paku Alaman Temple, and several attendees on December 29, 1922, Ejaan Sriwedari was born, which was an agreement on how to write Javanese script. The Dutch East Indies government decided what was obtained from the seminar. Paheman Radya Pustaka also publishes monthly Javanese language magazines (Sasudara, Candrakanta, and Nitibasa), organizes courses (dalang, gamelan, Kawi language), and holds performances (making puppets, carving wood, making keris, and making batik) (Tjahjopurnomo et al., 2011).

From some literature, museums' notion is a site where we study, but in Indonesia in general, museums' role has not played that role optimally. That is one reason why museums are not the primary destination for public and tourist visits. The image of the "museum" in the general public seems to stop at the form of a dusty old building, with dark and spooky rooms, an old and opaque display design that displays "dead" collectibles. Management of display arrangement is nothing but the spearhead of museums' charm but is a weak point for most museums in Indonesia. Not only in terms of appearance that looks gloomy while visitors prefer to mention it with a scary atmosphere, but often the collections on display do not seem to have a storyline, so that this extraordinary museum collection appears only as a display in an antique kiosk.

Meanwhile, the definition of ergonomics is the study of the human condition both physically and in all matters relating to the five human senses. Humans' physical condition in their daily activities includes physical work, work efficiency, energy expended for an object, calorie consumption, fatigue, and work system organization. Meanwhile, those related to the five human senses include sight, hearing, feeling hot or cold, smell, beauty, and comfort (Wardani, 2011). Following the definition of design innovation is a creative action or effort in planning and making something that has goals and uses that prioritizes the principles of convenience aspects and the achievement of specific interests (targets) in the form of system elements (unity function), parts of a composition (material composition), aspects of goods (use objects), product elements (functional items made by industry), aspects of artifacts (cultural objects) designed to achieve specific interests in the design process (Wardani, 2011).

In a design that includes cross-disciplinary design, it is essentially a multidisciplinary activity. Behavioral science-based disciplines, such as ergonomics, have always intersected with other engineering-based disciplines that have traditionally governed most design activities. Technical displays in museums focus on solving problems with the community as consumers in an appropriate manner. In an era of the increasingly

rapid development of communication technology, many museums in western countries use interactive display methods to provide educational and recreational aspects to museum visitors (Hashim et al., 2014). Display design can be related to consumer behavior, especially museum visitors, in enjoying and visiting the Radya Pustaka Museum. As in studies suggesting that the aesthetic nature of visual stimuli leading to preferences and underlying mechanisms has long attracted the interest of researchers in art, environmental psychology, and marketing describes how the encouragement or stimulation serves to encourage consumption pleasure. (Oh & Petrie, 2012).

#### 4 Conclusion

By playing a significant role in preserving the existing collections, a museum is a place for placing cultural artifacts where the public can take advantage of it for education, development of science, and other aspects of life related to the existence of the Radya Pustaka Museum, Surakarta. The solution in the results of this study impacts the existence of the Radya Pustaka Museum, Surakarta, especially in the ergonomic aspect of managing the display design of the museum collection as part of the appeal to tourists and visitors, as well as safety and comfort factors. The display design that meets the ergonomic aspect and attracts visitors can provide access to the view and enjoy various artifacts in the museum. The condition of the museum that is representative both from the aspects of collection management and display design will create a museum worth visiting so that the impression of the slum, dirty and creepy will disappear from the stigma of the wider community's view.

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