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The Display Of Museum Sandi Yogyakarta

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ABSTRACT

Museum Sandi is a special government museum managed by the Badan Siber dan Sandi Negara (BSSN), which was inaugurated in 2014. The museum has eight types of collections which are divided into nine exhibition rooms. Each room has a theme based on the collection it is arranged in. The aim of this research is to find out related matters in the display system at the Museum Sandi. The research method used is a qualitative research method with a theoretical approach to museum exhibition layout. Data was collected using direct observation methods, semi-structured interviews, and literature studies. The results of the research reveal that matters related to museum exhibition layout include supporting elements and aspects which are arranged in the form of: space, floor-space design and visitor circulation, exhibition text and labeling, work material and storyline, lighting, as well as facilities and supporting visual elements. Based on the research results, it can be concluded that the Museum Sandi's display system uses the rules for using cultural heritage buildings. This consideration of building intervention and space adaptation is applied to present the collection.

Keywords: Museum Sandi, display, cultural heritage building

INTRODUCTION

Museums have an important role in preserving cultural heritage as evidence of human civilization that has traversed various aspects of life. Through museums, artworks and valuable artifacts can serve as educational and informative mediums for the public, especially for the younger generation. Historical knowledge about cryptography will be unveiled through the collections presented by the Museum Sandi, utilizing various exhibition concepts that meet museum standards. The arrangement and organization of collections in each room must be carefully considered to enhance the beauty of the space (Ardiwijaya, 2013:1).

In exhibition display theory by Susanto (2016:177), space is presented as a setting for displaying artworks. The rooms in Museum Sandi are used for showcasing collections. The building housing Museum Sandi is a Cultural Heritage Building, maintained in its original state without any alterations. Therefore, to preserve its integrity, the government prohibits any changes to the building's structure, allowing only repairs that comply

with cultural heritage building regulations. As a result, Museum Sandi focuses solely on exploring and organizing the space for collection presentation.

Museum Sandi boasts an engaging exhibition display, evidenced by the arrangement of its collections into nine rooms that showcase the history of cryptography both globally and locally. The museum staff has clearly put in significant effort to organize these spaces effectively, ensuring that all information about the history of cryptography is cohesively presented across the nine rooms for visitors to absorb.

Given the diversity of the collections, it is essential to craft a narrative that guides their placement. An engaging and interactive exhibition layout is key to attracting visitor interest. Special attention is needed in organizing the collections in each room to enhance the space's aesthetic appeal. Collection descriptions should also be informative, ensuring that the exhibits serve not just as decorations but also as educational tools for visitors. The collections should 'tell a story' to visitors through various methods, such as videos and interactive displays. Providing additional information in this manner

will elevate the perceived value of the collections in the eyes of the visitors.

Based on this background, this study will discuss the Museum Sandi and its important role in conveying information about the history of cryptography. This significantly influences the spatial layout concept of the building. The research titled "The Display of Museum Sandi Yogyakarta" is conducted because it occupies a cultural heritage building with numerous rooms, making it unique and providing a foundation for this research topic

METHOD

This research uses a qualitative descriptive method, namely by conducting research at Museum Sandi Yogyakarta.

Observation

This research employs a non-participatory observation method, involving direct fieldwork to identify issues and collect data. However, the researcher did not take part in the exhibition arrangement process at Museum Sandi. Observations were conducted during two periods: during an internship from August to December 2023 and the research period from February 27 to March 31, 2024.

Interview

This research employs semi-structured interviews with the museum director, curator, and exhibition designer.

Documentation

These documents may include a variety of sources such as news, articles, books, notes, and archives related to the exhibition display of Museum Sandi.

RESULT AND DISCUSSION

The majority of Museum Sandi's collections were acquired through donations from the families of cryptography figures and the National Crypto Agency (*Lembaga Sandi Negara*/Lemsaneg), now renamed the National Cyber and Crypto Agency (*Badan Siber dan Sandi Negara*/BSSN). These collections are categorized into 8 types: primary support tools, documents, heraldry, visualization objects, cryptographic equipment, general supplies, historical artifacts, and clothing.

Museum Sandi has a collection of 235 items, with some displayed in the exhibition space while the rest are stored due to limited display area. The museum comprises 9 rooms, with the final room, the education room, serving as an interactive space for visitors. In organizing the exhibition space, several aspects will be examined, including:

Space

Museum Sandi is housed in a building located within the Kotabaru area, which was a residential area for Europeans during the Colonial period. Originally constructed as a residence for Europeans in 1920, this Cultural Heritage Building comprises two floors with large doors and windows. To repurpose the building as a museum, additional facilities that meet museum establishment requirements were necessary. However, these additions had to be carefully integrated to respect the structure and individual rooms of the building. For example, Museum Sandi added panels to increase the available space.

According to Sorokin's theory on the white cube, it is a natural space with minimalist decor and must not be ideological. This natural space can be redesigned to create new compositions of artworks (museum collections), with collections arranged and placed in empty, natural spaces. This means that the rooms can be directly filled with museum collections. However, since Museum Sandi occupies a Cultural Heritage Building, the museum cannot freely arrange the composition of its collections. Consequently, the museum must adapt to the space, making only limited interventions in certain areas without disturbing the core architecture of the Indischestyle building.

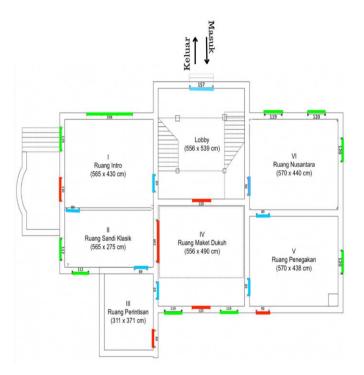


Figure 1. 1st Floor Layout of Museum Sandi Source: Museum Sandi, 2023

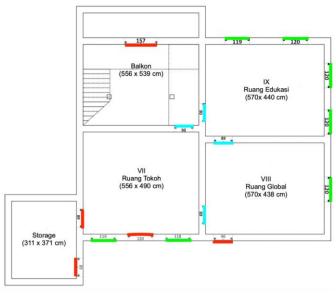


Figure 2. 2nd Floor Layout of Museum Sandi Source: Museum Sandi, 2023

The exhibition rooms in Museum Sandi feature numerous windows and doors. In Figures 1 and 2, the green lines indicate windows, the blue lines represent doors used for visitor circulation, and the red lines signify doors that are closed to control visitor flow.

Floor-Space Design and Visitor Circulation

From a structural perspective, Museum Sandi can be categorized as a natural space because the museum has adapted the existing rooms. Conversely, the rooms designated for displaying collections are considered white cube spaces. Therefore, the existing rooms are rearranged to meet the compositional needs of the collections. However, the museum is not permitted to freely intervene in ways that might alter the original form of the building. As a result, the principle of spatial adaptation is employed to maintain the concept of a natural space within rooms that adopt the white cube style.



Figure 3. Wallpaper in Nusantara Room Source: Bertha A. Akeyla, 2024

In the Nusantara Room and the Tokoh Room, wallpaper was added to enhance the aesthetic value and prevent damage to the walls. Initially, GlassFiber Reinforced Concrete (GRC) was used. This material is a

type of concrete reinforced with fibers. It consists of glass fiber reinforced concrete made from acrylic polymer, fine sand, water, cement, and alkali-resistant glass fibers, which is then covered with wallpaper. Such measures are taken to preserve the building's structure.

One room in Museum Sandi has numerous doors and windows, so the museum decided to use only a few doors for visitor circulation and to close the rest. There are two types of windows: glass windows and wooden windows, which are fitted with grilles. Grilles are iron frame constructions that serve to prevent thieves from entering through the windows and also act as decorations on doors and windows.

The glass windows are covered with red and white paper to enhance the atmosphere of the struggle in each room. The doors in Museum Sandi range in size from 100 x 250 cm to 215 x 250 cm. The windows vary in size from 100 x 90 cm to 300 x 200 cm. There are nine air conditioners in the exhibit rooms, with Panasonic and Daikin brands. Museum Sandi has 17 windows and 32 doors, all made of teak wood.



Figure 4. Floor Design Source: Bertha A. Akeyla, 2024

The floor in Museum Sandi features traditional tiles measuring 20 x 20 cm. These tiles are in excellent condition and have never been replaced. The tiles, which are gray with a red border running along the edges, are present in all the rooms of Museum Sandi. Carpets have been added in some rooms to protect the original flooring. Elements such as door frames, ceilings, and the overall architecture in Museum Sandi are maintained and restored as needed without replacement. The height between the floor and the ceiling is approximately 4 meters.

The visitor circulation is designed to facilitate easy viewing of the entire collection displayed in Museum Sandi. Additionally, the arrangement of the route and circulation in the exhibition space is structured to guide visitor movement, ensuring they do not become bored while exploring. Visitor movement is influenced by the presence of a guide or museum educator. The presence of a guide or museum educator helps visitors obtain information according to the predetermined circulation path.



Figure 5. Footmark Source: Bertha A. Akeyla, 2024

Museum Sandi features a colorful footmark system on the floor at each intersection of the exhibit spaces. These footmarks, which are stickers placed on the floor, serve as directional guides for visitors. The footmarks are made large and plentiful enough to ensure visitors can easily follow them. This system helps maintain an orderly flow of visitors, as Museum Sandi implements a standard circulation path for them.

The exhibition layout is divided into 9 rooms, each with a different storyline. If visitors do not follow the correct circulation path, the information presented in the exhibit spaces can be challenging to comprehend. However, this issue is rare because every visit to Museum Sandi is accompanied by a guide or museum educator, allowing visitors to view the entire collection sequentially. According to theoretical foundations, the visitor circulation at Museum Sandi follows a radial plan pattern.



Figure 6. Visitor Circulation and Map of Museum Sandi Source: Museum Sandi, 2021

As shown in Figure 6, the exhibition layout indicates the direction of visitor flow with white arrows. On the first floor, the visit begins at the lobby (marked with letter B in Figure 6) and ends at the Nusantara room (marked with letter H in Figure 6). The visit then continues on the second floor, starting at the Global room (marked with letter I in Figure 6) and concluding at the Education room (marked with letter K in Figure 6). This flow is displayed in the Intro room to inform visitors of the path they will follow throughout their visit to Museum Sandi. The standard tour route for visitors starts on the first floor and then proceeds to the second floor.

Overall, the visitor circulation is not yet well-organized due to several doors needing to be closed. Visitors are directed into each room to view the collections according to the themes presented by each space. Visitors enter from the lobby on the first floor, then return to the lobby to ascend to the second floor. After touring the second floor, visitors descend and find themselves back in the lobby, as Museum Sandi has the same entrance and exit, located in the lobby. This sequential arrangement of rooms facilitates easy navigation for visitors. If the number of visitors is high, this setup helps minimize congestion in the entrance and exit flow.

Exhibition Text and Labeling

As stated in the theoretical foundation, there are four types of texts in an exhibition space that should be carefully considered and presented comprehensively and well (Susanto, 2016:190). These texts are title and subtitle texts, introductory/curatorial texts, group texts, and work labels. Museum Sandi does not have title texts and introductory/curatorial texts, so it only includes group texts and labeling on the collections and rooms.



Figure 7. Audio Visual as an Introduction Source: Irawan Haris Wibawa, 2024

The curatorial text at Museum Sandi is presented through educational media in the Intro room. In this room, visitors are informed about what they will see in the museum via a video with a duration of approximately 3 minutes. This approach is used because wall text is considered limited in conveying introductory information to visitors. Therefore, the narrative is

delivered through audiovisual media rather than text, providing an introduction or initial explanation about what visitors will encounter in Museum Sandi. The media used to display the audiovisual content is a 62-inch *Samsung* Smart TV.



Figure 8. Group Text in Perintisan Room Source: Bertha A. Akeyla, 2024

The group text is an extension of curatorial text or text that classifies a number of object/collection groups. An example of the use of group text is found in the Inception room. These texts are separately framed using glass frames. Unfortunately, the use of glass frames makes the text inside less clear due to light reflection, requiring visitors to be very close to the text to see it clearly. The inter-texts have the same design because they are still interconnected or part of the same narrative sequence. The color selection for the group text in the Inception room is made to match the wall color so that it blends with the color scheme in each Inception room.



Figure 9. Group Text in Global Room Source: Bertha A. Akeyla, 2024

Another group text is found in the Penegakan room and the Global room. These banners have been present since the Museum Sandi was located at the Museum Perjuangan before being moved to Kotabaru. The group text in the Perjuangan room explains the history of cryptography in Indonesia, while the group text in the Global room elaborates on the history of cryptography worldwide. Both group texts are considered less effective due to their densely packed content and very small font size. With limited visitation time, visitors are unable to read the texts in their entirety. Additionally, the placement of the texts is not ideal as they are obscured

by collections positioned very closely, especially the lower parts covered by display cases, which makes it impossible for visitors to read them.



Figure 10. Cardan Grille Collection Label on Wall (left) and Acrylic Holder Model V (right)

Source: Bertha A. Akeyla, 2024

Museum Sandi presents its collections with three types of labels. The first type uses white paper inserted into acrylic panels sized from 23 x 32 cm to 32 x 44 cm, adhered to the walls. These labels provide comprehensive and detailed information about the collections, aiding visitors in understanding what Museum Sandi presents. Unfortunately, the text on these labels is densely packed, making it challenging for visitors to read it in its entirety. The second type consists of acrylic model labels. There are two variations: those affixed to the walls and those inside display cases (vitrines). The wall-mounted labels are inserted into V-shaped acrylic holders, sized 23 x 32 cm, and formatted in landscape orientation.



Figure 11. Floor Standing Label Source: Bertha A. Akeyla, 2024

The third type employs a floor-standing model supported by iron and wooden poles, measuring 40 cm x 35 cm x 90 cm. This model utilizes paper material with acrylic accents. There are also floor-standing labels inside showcases in the Tokoh room, using paper material similar to the other labels. The distinction lies in the support poles, which are made of full iron and wooden boards covered with cloth.



Figure 12. Room Label Source: Bertha A. Akeyla, 2024

Apart from collection labels, it also includes room labels within the exhibition space. At Museum Sandi, each room features a 30×10 cm room name label and an Etos Sandi label measuring 9.5×10 cm, representing the contents of the room. These labels are positioned above the entrance of each room, with the Etos Sandi label placed above the room name label.



Figure 13. Cipher Machine Label Source: Bertha A. Akeyla, 2024

Museum Sandi has special labels for its cipher machines. These aluminum labels measure 23 x 6 cm and are in a golden yellow color with black-bordered text displaying the machine names. They are placed alongside the cipher machine collections and collection texts inside the showcases. Overall, the labels for each collection item feature a consistent design, using white paper with blue accents. Since 2020, Museum Sandi has employed bilingual texts for each of its collections, with Indonesian on the left and English on the right, or Indonesian on top and English at the bottom.

Collection Material and Storyline

The Museum Sandi's storyline has remained unchanged since its establishment as a museum on February 14, 2014. At that time, a policy was set by the Lemsaneg to establish a chronological exhibition flow based on the history of cryptography. The existing collections were then aligned with this established storyline. The permanent exhibition at Museum Sandi consists of various collection items including cipher machines, clothing, documents, cameras, medals, and other diverse collections. These collections are displayed according to their relevance to the established storyline in each room. The materials serve as the foundation for understanding the depth of information to be conveyed, and they are utilized to compose the exhibition storyline.

The display of Museum Sandi is based on a deductive thinking pattern with a thematic chronological flow. Deductive thinking entails presenting exhibits in the museum starting from general aspects to specific

ones. Explanations regarding general knowledge, theories, definitions are provided initially, while events, trivia, operational mechanisms, and others are displayed to clarify and emphasize specific aspects of the general topics. The sequential branching of the room story is as follows:

• Intro Room

In the Intro Room, visitors are presented with an introductory video as a starting tool to learn about the history of cryptography. This approximately 3minute video is carefully crafted so that visitors from various backgrounds can grasp the information being conveyed. In this room, explain guides/educators Cryptography, Cryptology, Cryptanalysis initial and as understanding before viewing the collections in the subsequent rooms.

• Classic Room

The classification of collection types based on time (chronological) is found in the Classical Cipher Room. This room features a timeline of ancient cryptography, explaining the evolution of encryption techniques or information security dating back thousands of years. Inside the Classical Cipher Room, displayed collections include ancient cryptographic tools such as Cuneiform, Skytale Greek, Tattoo Statue, and Cardan Grille.

• Perintisan Room

Visitors are presented with captions, a Code C book, and a diorama depicting the establishment of the *Dinas Kode*, featuring statues of Defense Minister Amir Sjarifoeddin and Dr. Roebiono Kertopati. This room provides information about the origins of cryptography establishment in Indonesia.

Maket Dukuh Room

In the Maket Dukuh room, visitors can witness a diorama depicting the emergency cipher room activities when the Chief Data Officers (CDO), also known as "sandiman", used the house after the Dutch army attacked Yogyakarta. The storyline in this room follows a chronological sequence from the Perintisan Room.

Penegakan Room

The grouping of collection types based on thematic themes is found in the Penegakan room. Visitors are presented with objects related to encryption, such as the Desk and Chair of Sandi Dukuh House, Telegraph, Djanoko B Book, Old Bicycle, and others.

• Nusantara Room

In this room, a number of Indonesian-made cipher machines are displayed, ranging from the first ones built to those used in the 1990s. These machines are arranged chronologically according to when they were made. Alongside displaying cipher machines, the room also features mannequins of Poltek SSN cadets and provides a glimpse into the history of cryptographic education in Indonesia.

Tokoh Room

Continuing to the second floor, visitors will be introduced to several figures who have led cryptographic institutions in Indonesia, initially known as the Dinas Kode and later renamed to the BSSN as it is known today. This room also showcases personal belongings of cryptographic figures such as cameras, watches, knives, notebooks, and others.

Global Room

Classification based on object type (thematic) is found in the Global room, which includes foreign-made machines accompanied by intriguing stories. This room also provides information about World Intelligence Signal Agencies.

• Education Room

In the education room, visitors can play the Caesar Cipher game provided at the lobby at the beginning of the visit, guided by an educator. Visitors can also engage in puzzles and write their impressions and messages to be placed on the provided board.

In conclusion, the entire exhibition at Museum Sandi groups various types of collections based on chronological periods and specific themes. Therefore, the museum combines two approaches: a chronological approach with thematic characteristics. Unfortunately, despite the rapid advancement of technology, all exhibit materials remain static.

Lighting

The lighting used by Museum Sandi is artificial lighting. Despite having windows and ventilation holes in the building, Museum Sandi relies solely on artificial lighting because it serves the purpose of illuminating the space and collections, enhancing the exhibition environment. Of the three theoretical foundations regarding illuminated areas, Museum Sandi employs only two types of lighting, general lighting and task lighting.



Figure 14. General Lighting Source: Bertha A. Akeyla, 2024

The rooms in Museum Sandi are relatively small, so they use only one light source or one lighting point to provide general illumination. The lighting used consists of recessed ceiling lights.



Figure 15. Task Lighting Source: Bertha A. Akeyla, 2024

Museum Sandi extensively uses task lighting to focus on the collections. The task lighting includes spotlights. The characteristics of spotlights are crucial in providing effective lighting in the museum's exhibition space. In addition to illuminating the collections, Museum Sandi also uses spotlights for group texts. Lighting design can create a more engaging atmosphere, such as using focused lighting on each object in addition to normal lighting.

In both examples, the light from the spotlight is not appropriately positioned, as it directly shines on the glass display, causing glare. This makes it difficult for visitors to read the collection descriptions or texts. This issue can be avoided by adjusting the position of the lights so that they do not directly shine into the visitors' eyes or reflect excessive light into their line of sight.



Figure 16. Washing Theory of Lighting Source: Bertha A. Akeyla, 2024

There is a theory regarding lighting techniques. Out of the four theoretical foundations on lighting techniques, one method applied by the Museum Sandi is "Washing". Washing in lighting provides uniform illumination on walls from ceiling to floor. This technique also directs light straight down to the floor. In the showcases in the Tokoh room, the washing technique uses lights embedded in the ceiling of the showcase. To ensure the safety of the collection, ceiling-embedded lights with low UV emissions and bright illumination are

chosen. The distance between the collection and the lights is calculated to be 50 cm, while the distance between lights is 180 cm.

Lighting at Museum Sandi is tailored to each exhibition space where collections are displayed. For example, in rooms with natural ventilation, windows are sealed and replaced with artificial lighting such as LED lamps and additional spotlights. Without additional lighting like spotlights, these spaces would appear somewhat dim and less conducive for visitors to view the exhibits comfortably. In conclusion, lighting at Museum Sandi has been adjusted to consider its effects on the exhibition space ambiance, including illumination of collections, room colors, and the colors of exhibited objects.

Facilities and Supporting Visual Elements

Supporting facilities are typically provided to fulfill functional needs without needing to focus too much on the design or placement. As a museum open to the public, it is important to consider facilities that enhance visitor comfort, such as: registration desks, toilets and sinks, mother and child rooms, seating areas and gazebos, trash bins, community rooms, meeting rooms, bicycles, an auditorium, and a prayer room.

The registration desk is a crucial part of the museum. It serves as a point of contact between visitors and the museum's educators/guides. The registration desk is located in the lobby. Upon arrival, visitors first enter their information into the book provided at the desk, and then they are directed to the Intro room. This desk allows visitors to find information related to the Museum Sandi. Additionally, there is a complaint service available on the monitor to the right of the registration desk.

Museum Sandi provides clean and well-maintained toilets and sinks for visitors. The sinks are located in the courtyard, with a total of two. There are separate male and female toilets on each floor. The gazebo is a relaxing spot for visitors to unwind after touring the museum. It is available for those who wish to chat and relax outside the museum building. Additionally, several trash bins are provided throughout the area. The bins are designated for organic and inorganic waste, ensuring proper waste segregation. The hall and community room at Museum Sandi are available for public use. These spaces can be reserved for various events and activities free of charge, aimed at introducing Museum Sandi to the broader community.

Beyond facilities, there are visual elements that complement the stories or information presented in the museum. Supporting visual elements in an exhibition often have a relationship that enhances the objects or stories curated (Susanto, 2016: 201). At Museum Sandi, these supporting visual elements include photos, audiovisual media, and interactive displays.

In several rooms, there are supporting visual elements in the form of photographs. These photos are framed in black with captions below each image. In the Maket Dukuh room, there is a photo of the Rumah Sandi. In the Penegakan room, there are two photos. Along the staircase walls, there are seven photos. All these photos serve the same purpose: to support the exhibited collections.

CONCLUSIONS

The Museum Sandi was established on January 14, 2014. It is classified as a specialized museum because its collection is solely related to the history of cryptography, including cipher machines, attributes of cryptographic figures, dioramas, models, documents, and more. This national museum is managed by the regional government under the National Cyber and Crypto Agency (BSSN). Currently, Museum Sandi has a total of 235 items in its collection, consisting of eight different types.

Museum Sandi is located in the former office of the Indonesian Ministry of Foreign Affairs during the struggle period from 1947 to 1948, which is a designated cultural heritage building. To protect the collection and preserve the building, the museum has successfully integrated the beauty of the historic structure with its collection without obstacles. In organizing its exhibitions, the museum follows guidelines that set limits on the use of historic buildings as public exhibition spaces. These guidelines emphasize that changes to the building's facade cannot be made carelessly and must not damage any parts that could alter the building's appearance.

Several elements are related to the exhibition display at Museum Sandi, including:

- Space, the museum uses both natural space and white cube types in its exhibition rooms.
- Floor-Space Design and Visitor Circulation, the museum does not alter the design of the rooms and floors but rather adapts the existing layout. The museum adds walls in the form of gypsum panels layered with GRC to increase the number of exhibition spaces. Additionally, carpets are used in certain rooms to protect the floors from damage. The museum employs a radial plan circulation pattern, guiding visitors through the exhibition rooms. This path leads visitors from a single entry point to the exit.
- Exhibition texts and labeling, Museum Sandi uses only two types of exhibition texts: group texts and collection labels. This is because curatorial texts have been replaced with audiovisual media in the Intro Room. Group texts provide explanations about the history of cryptography and are placed within the exhibition rooms, while collection labels provide the names and brief histories of the items.

- These labels come in several variations, such as floor standing, V-model acrylic holders, and wall-mounted acrylic. In addition to these texts, Museum Sandi uses room name labels above the doors and cipher machine name labels within display cases.
- Collection materials and storyline, Museum Sandi uses a narrative concept to tell the story of cryptographic history in Indonesia and the world. This narrative is divided into nine rooms, forming a cohesive storyline. Overall, the exhibition groups various types of collections based on chronological periods and specific themes. Therefore, Museum Sandi combines two approaches: a chronological approach with thematic characteristics.
- Lighting, an artificial lighting system, closing off all windows and doors. The main source of artificial light comes from recessed ceiling lights, supported by various lamps. The museum uses two types of artificial lighting: general lighting and task lighting, as well as the washing illumination technique.
- Facilities and supporting visual elements, facilities for visitors including a registration desk, toilets and sinks, a mother and child room, seating areas and gazebos, trash bins, a community room, a meeting room, bicycles, an auditorium, and a prayer room. These are complemented by supporting visual elements, such as photos, documentary videos displayed on monitors, audiovisual media, and interactive displays. The technical exhibition layout at Museum Sandi includes display cases, showcases, wooden cabinets, and pustek.

Overall, the presentation of the collection at Museum Sandi has been adapted to the room's structure, although the artistic aspects have not yet been fully optimized. The current presentation reflects the dedication and best efforts of the museum staff to ensure the safety of the collection and the comfort of the visitors.

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Interview

Arifin