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# PRESERVATION OF VISUAL CULTURAL HERITAGE THROUGH THE MANAGEMENT OF DIGITAL ILLUSTRATIONS OF THE NUSANTARA MANUSCRIPT OF THE NATIONAL LIBRARY OF THE REPUBLIC OF INDONESIA

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**Abstract**
The digitization of Indonesian manuscripts is not only related to the preservation of texts, but also includes visual information such as illustrations and illuminations. Previous studies have focused more on the technical aspects of digitization, while the representation of illustrations in metadata is still rarely studied. In fact, without a clear representation, illustrations are difficult to trace and utilize as cultural information. This study aims to examine the management of illustrations of Indonesian manuscripts in digital form and analyze their representation in metadata on the Khastara portal at the National Library of the Republic of Indonesia. The method used is a qualitative case study approach through non-participatory observation techniques, interviews, and literature review with five informants. Data analysis refers to the Digital Cultural Heritage Standards framework: From Silo to Semantic Web, which includes elements of METS, Semantic Web, and Enricher. The research findings show that digitization is carried out systematically and is able to record illustrations well visually. However, in metadata, illustrations are still presented as part of the general description of the manuscript and have not been positioned as independently accessible information. This condition indicates that the function of metadata is still limited to collection description and does not fully support the traceability of visual information. This research confirms that metadata development needs to be directed at the ability to represent illustrations as structured visual information. This is crucial so that digital repositories function not only as storage but also as a means of broader access and utilization of cultural heritage.
**Keywords**: digitalization, illustration, metadata, Indonesian manuscripts, cultural heritage.

## INTRODUCTION

Nusantara manuscripts represent a significant representation of the intellectual and cultural achievements of Indonesian society in the past. These manuscripts not only reflect centuries-old literary traditions but also serve as a medium for transmitting knowledge, cultural values, and complex visual expressions through a combination of text, illustration, and illumination. According to the National Master Plan for Mainstreaming Nusantara Manuscripts

2025–2034, the number of identified manuscripts reached 143,259 copies, distributed both domestically and internationally, demonstrating the breadth of the archipelago's scientific and cultural networks across regions and eras. However, the fragile physical condition of manuscripts due to age, the characteristics of traditional writing materials, and the effects of the tropical climate make physical preservation increasingly inadequate.

Along with technological advancements, digital transformation is seen as a key strategy for preserving this cultural heritage. The National Library of Indonesia, through its Khastara (Khazanah Pustaka Nusantara) portal, is developing a digital repository that enables open access to Nusantara manuscripts. Manuscript digitization is a crucial strategy for safeguarding the nation's intellectual treasures from the threat of physical destruction, but it also faces technical challenges such as limited human resources and inadequate digital infrastructure (Prastiani & Subekti, 2019). Among the various categories of digital collections available, Nusantara manuscripts have unique characteristics because they contain visual elements in the form of illustrations and illuminations, which possess significant aesthetic, symbolic, and spiritual value.

Illustrations and illuminations are visual elements that have distinct but complementary functions and meanings within the manuscript's structure. Illustrations serve to clarify and strengthen the text's narrative, while illumination serves as symbolic ornamentation, marking important and sacred sections within the manuscript. These visual elements serve more than just decorative purposes; they also represent cultural identity, value systems, and the perspectives of past societies on the world and knowledge. Ideally, the preservation of Nusantara manuscripts should not only focus on the text and narrative content but also encompass the preservation of visual elements as carriers of cultural meaning and knowledge (Izzuddin & Holil, 2023).

Despite the ongoing digitization program, the management of illustrations in digital Nusantara manuscripts still faces various challenges. Based on observations on the Khastara portal, illustrations are indeed displayed as part of the digital manuscript, but they have not been specifically represented in metadata. Visual information is still presented generally, so illustrations do not have a specific marker as a stand-alone information element. This condition impacts the retrieval system and utilization of digital collections. Illustrations do not have access points in metadata, so they cannot be searched directly through the system. In terms of accessibility, users need to open the entire document to find illustrations. In terms of utilization, illustrations have not been optimally used as a source of information in visual culture studies. This indicates that the management of illustrations in digital systems does not fully support the function of preserving visual information. Hendrawan et al. (2024) emphasized that metadata created with the same standards and adapted between systems helps cultural heritage collections be more easily accessed and distributed across various platforms. In line with this, Pandanwangi et al. (2023) showed that the illumination of 18th-19th century Javanese manuscripts not only has aesthetic value but also holds philosophical meaning that reflects the cultural identity and traditions of the writers of their communities.

To examine this issue, this study utilizes the Digital Cultural Heritage Standards: From Silo to Semantic Web theory proposed by O'Neill & Stapleton (2022), which encompasses three main elements. The first element, mets (metadata encoding and transmission standard), is used to integrate the visual data of physical manuscripts with their digital representations; the second element, semantic web, is utilized to assess the searchability of illustrations on the Khastara portal; and the third element, enricher (enhanced metadata for cultural heritage),

emphasizes the role of various parties as key actors in the process of enriching cultural information. This framework allows digital manuscript management to be understood not only as a technical process but also as an interpretive process containing cultural meaning.

Various studies have examined manuscript digitization as part of a cultural heritage preservation strategy. Wirajaya's (2017) research focuses its general study on the digitization of Indonesian manuscripts as an effort to safeguard and preserve the nation's intellectual treasures. The study highlights policy aspects, strengthening inter-institutional collaboration, and the development of a national digitization roadmap involving the National Library of Indonesia and Manassa. On the other hand, Hendrawati (2018) emphasized the technical procedures for manuscript digitization, from the pre-digitization stage through the media transfer process, to post-digitization, with primary attention to preserving the text's content and addressing various technical constraints, such as resource limitations and the physical condition of the manuscript. Furthermore, Aouinti et al.'s (2022) research focused on developing an automated machine learning-based system for identifying illustrations in digital European manuscripts using a Convolutional Neural Network (CNN) model and the International Image Interoperability Framework (IIIF) standard. This research emphasized technological innovation in visual element detection rather than collection management aspects.

This research has a unique aspect that distinguishes it from previous studies. It focuses on the management of illustrations of digital Nusantara manuscripts at the National Library of Indonesia. This research not only discusses the digitization process but also examines their representation in the metadata of the Khastara portal. Previous research has not addressed this aspect extensively, resulting in illustrations lacking clear labeling within the metadata system. Consequently, illustrations lack access points within the system, making them difficult to trace and utilize as cultural information. The urgency of this research lies in the importance of managing illustrations in metadata, which impacts the quality of retrieval, accessibility, and utilization of digital cultural heritage. Without adequate management, illustrations risk being unidentified in the system, thus underutilizing their information value.

This study aims to describe the management of digital illustrations of Indonesian manuscripts at the National Library of Indonesia and to analyze the extent to which metadata on the Khastara portal represents these visual elements. Furthermore, this study aims to identify various obstacles in the process of managing digital illustrations of Indonesian manuscripts and outline solutions implemented as part of efforts to preserve visual cultural heritage in the era of digital transformation.

This research is expected to enrich digital preservation studies, particularly in the management of illustrations as part of the metadata of Indonesian manuscripts. Furthermore, this research can be used as a consideration in developing metadata management to better support the optimal use of visual information.

## RESEARCH METHOD

This research uses a qualitative method with a case study approach to examine the management of illustrations and illuminations of Indonesian manuscripts in the context of digitization. The case study approach was chosen because it allows researchers to understand and describe a phenomenon in depth within a real-life context, especially when the research focuses on a specific system or location (Creswell, 2018). The research was conducted at the National Library of Indonesia, specifically at the Center for Preservation and Media Transfer of

Library Materials, as the unit responsible for the digitization and management of Indonesian manuscripts. Research subjects were determined through purposive sampling, which involves the deliberate selection of informants based on criteria aligned with the research objectives (Fiantika et al., 2022). The informant selection criteria in this study were formulated based on their involvement in manuscript digitization, metadata management, and relevant work experience. The criteria and roles of informants are presented in the following table.

Table 1. Research Informants

| Informant Code | Role | Criteria of Informant |
|---|---|---|
| S | Librarian | Involved in processing metadata and describing collections |
| J | Philologist | Understanding the content, context, and meaning of illustrations |
| D | Digitization Team Leader | Responsible for planning and implementing digitization |
| K | Media Transfer Staff | Carrying out the stages of digitization |
| M | Research and Development Team Leader | Involved in developing digital systems and managing information |

Source: National Library of the Republic of Indonesia

The analysis was conducted using the Digital Cultural Heritage Standards: From Silo to Semantic Web framework as an analytical tool to assess digital illustration management practices implemented at the National Library of Indonesia. The mets (metadata encoding and transmission standard) element was used to compare the conformity of illustrations in physical manuscripts with their corresponding digital metadata objects. The semantic web element was used as an analytical framework to assess the extent to which the metadata structure and description on the Khastara portal support the representation and interconnectedness of the manuscripts' visual elements. The analysis focused on the limitations of metadata in linking illustrations as visual information. Meanwhile, the enricher (enhanced metadata for cultural heritage) element was used to examine the roles of various parties involved in the process of enriching visual information as part of digital cultural heritage preservation.

Data collection was conducted through non-participatory observation, in-depth interviews, and literature review. Non-participatory observation and in-depth interviews served as primary data sources in this study, while literature review served as a secondary data source to strengthen and complement field findings (Creswell, 2018). Non-participatory observation was conducted by directly observing the manuscript digitization process, from the preparation stage to the management of digital files. In this process, researchers used observation guidelines that focused on the digitization stage, illustration management, and metadata management. In-depth interviews were conducted using a semi-structured approach using interview guidelines based on the problem formulation and theoretical framework used. Interviews lasted 30-60 minutes for each informant. Interview data was recorded, transcribed, and analyzed according to the research focus. Literature reviews were conducted to examine standards and relevant supporting documents. This data was used to strengthen and compare field findings with theory and previous research. Data were analyzed using the Miles & Huberman (1992) interactive analysis model, which includes data reduction, data presentation, and conclusion drawing. In the data reduction stage, researchers selected data from observations, interviews, and literature studies based on the problem formulation. Next, the data were collected into themes arranged based on the theoretical framework used, namely the METS, Semantic Web, and Enricher elements. This process also served as the data coding stage

by grouping information into relevant themes. In the data presentation stage, the results were compiled in the form of an analysis that connected field findings with the theoretical framework. Next, in the conclusion stage, the researcher interprets the data to analytically answer the research questions. During the analysis process, data obtained from observations, interviews, and literature studies are combined. This ensures that the analysis is not merely descriptive but also yields a deeper understanding.

Data validity is maintained through source triangulation, technical triangulation, and time triangulation (Sa'adah et al., 2022). Source triangulation is conducted by comparing information from parties involved in the digitization and processing of manuscript metadata. Technical triangulation is conducted by comparing the results of non-participatory observation, interviews, and literature studies. Meanwhile, time triangulation is conducted by collecting data at different points in time to ensure consistency of information. Through these procedures, research findings in the context of digitalization have a level and credibility that can be academically justified.

## RESULT AND DISCUSSION

This research uses the Digital Cultural Heritage Standards: From Silo to Semantic Web framework by O'Neill & Stapleton (2022), which includes elements of METS to analyze the structure of digital objects and their metadata, Semantic Web to assess the searchability of illustrations on the Khastara portal, and Enricher to examine the role of various parties in empowering visual descriptions as part of digital cultural heritage preservation. Based on this framework, the following are the results and discussion of the management of digital Nusantara manuscript illustrations at the National Library of Indonesia.

### *Digitization of Nusantara Manuscripts in Illustration Management*

Digitization of Nusantara manuscripts is a preventative preservation strategy aimed at safeguarding visual cultural heritage. The vulnerability of physical manuscripts due to age, traditional writing media, and environmental influences makes digitization a crucial approach to shift access from physical objects to digital forms without increasing the risk of degradation of the original materials. In cultural heritage preservation studies, digitization is understood as a media transfer process centered on the desire for access to the visual and intellectual information of manuscripts (Mshvidobadze, 2021).

The media transfer activities were carried out in the digitization room located on the 5th and 6th floors of Building E of the National Library of Indonesia, involving a technical team that divided tasks according to their respective competencies. Based on responses from the National Library of Indonesia's media transfer team, the Indonesian manuscripts being digitized originated from the hunting and collecting activities carried out by the deposit center. These collections were obtained from various regions in Indonesia, such as Sulawesi, Sunda, Kalimantan, Bali, and Java. Manuscripts were obtained from communities, individuals, or institutions that submitted manuscripts for preservation. Therefore, the translated manuscripts are not merely internal collections, but represent the cultural richness of various regions.

The implementation of the manuscript digitization refers to the 2020 NSPK for Media Transfer, established by the National Library of Indonesia as an operational guideline (National Library of Indonesia, 2020). In its preparation, the NSPK adopted best practices, referring to international standards, such as the Federal Agencies Digital Guidelines Initiative (FADGI) and

Metamorfoze. These standards cover resolution, color management, image quality, and digital object management. In addition to adhering to the NSPK guidelines, the media transfer team also conducts routine evaluations at the end or beginning of each year, which serve as the basis for refinement methods, ensuring that visual quality and consistent preservation standards are maintained. Operationally, the digitization process for Indonesian manuscripts at the National Library of the Republic of Indonesia is carried out in two main stages: the preparation stage and the digitization process.

a) The preparation stage includes coordinating annual target determination, identifying and selecting manuscripts for suitability, carrying out conservation measures (if necessary), and submitting manuscripts to the media transfer room.

   The preparation stage is crucial because it sets the stage for how manuscripts are handled prior to digitization. At this stage, selection focuses more on physical condition as part of the conservation process. Illustrations have not yet received specific attention, so initial information about them has not been recorded in detail. This impacts the subsequent stage, where illustrations are only presented in general terms in the metadata. Within the Digital Cultural Heritage Standards: From Silo to Semantic Web framework, the METS element assesses the suitability of illustrations in physical manuscripts for digital objects. In the preparation stage, practices are appropriate because manuscripts are selected and prepared based on their physical condition, ensuring they are fully ready for media transfer. Meanwhile, the Semantic Web element emphasizes the need for specific identification and tracking of each piece of information. At this stage, this is not yet apparent because the identification process still focuses on the manuscript as a whole. Illustrations have not yet been recorded as separate pieces of information. Therefore, they lack a basis for specific tracking within the system. This finding aligns with Hendrawati (2018), who emphasized preventing damage before cultural objects are used more widely. However, when compared to Aouinti et al. (2022), who position illustrations as objects that can be specifically identified through technology, a difference in approach to positioning visual elements is apparent.

b) The digitization process includes manuscript preparation prior to photography, digital image capture using a high-resolution digital single-lens reflex (DSLR) camera, recto-verso shooting techniques, quality control, file format conversion, and digital storage and publication.

   The digitization process is crucial because it determines how the manuscript, including its illustrations, is captured digitally. The use of a high-resolution camera and quality control process demonstrates the primary focus on the accuracy and quality of the digital output. This ensures that all parts of the manuscript, including the illustrations, are fully captured. Within the framework of the Digital Cultural Heritage Standards: From Silo to Semantic Web, the METS element is appropriate because the digitization process produces an accurate digital representation of the physical manuscript. The object structure and image quality are well maintained. Meanwhile, in the Semantic Web element, which emphasizes information connectivity and retrieval, the digital output is not yet fully supported by specific information management. Illustrations have indeed been recorded, but they remain part of the overall manuscript page and are not yet recognized as separate information. This aligns with the findings of Rahmi & Nur (2025), who emphasized that digitization focuses not only on media transfer but also on quality assurance and file management for broad access. This research shows that the quality of digital output has not been accompanied by more specific

visual information management, particularly in recognizing illustrations as independently searchable components.

| Type of Collection | Total of Collection | Total of Copies |
|---|---|---|
| Rare Books | 2.599 | 4.451 |
| Voices | 100 | 1.070 |
| Maps | 1.874 | 2.226 |
| Photos, Drawings, and Paintings | 11.807 | 11.712 |
| Magazines and Newspapers | 640 | 309.519 |
| Ancient Manuscripts of the Archipelago | 10.859 | 23.103 |
| **Total** | **27.879** | **352.081** |

Findings regarding the number and classification of collections on the Khastara portal indicate that Indonesian manuscripts are positioned as part of an interconnected digital collection system. Manuscripts do not stand alone as separate archives, but rather are integrated within a collection structure that can be recognized, combined, and traced through available systems. Based on the Semantic Web elements within the Digital Cultural Heritage Standards: From Silo to Semantic Web framework, the standards emphasize not only the orderliness of metadata but also the interconnectedness of data, allowing each information element to be recognized as a specific entity and directly traced within the system. In this context, practices on the Khastara portal demonstrate that metadata fulfills the basic functions of digital collection management, such as categorizing and presenting organized information. This indicates that the orderliness and integration aspects of the system are functioning well. However, at the level of information connectivity and traceability, these practices have not fully met Semantic Web standards. Illustrations are still presented in a general manner and have not been positioned as metadata entities with their own access. Consequently, illustrations cannot be directly traced without opening the entire document. This situation indicates that the interconnectedness of visual data within the system is still limited.

Wirajaya's (2017) research states that manuscript digitization is not merely a matter of media transfer but requires a structured and integrated management system. This is also supported by Koho et al. (2023), who stated that national memory institutions play a crucial role in ensuring that cultural heritage collections are not only digitized but also managed in a structured manner for easy discovery and use by the public. This demonstrates a gap between the function of metadata as a collection management tool and as a means of information connectivity. Metadata is not enough to simply guarantee structural order; it also needs to address the ability to represent visual elements as units of information that can be accessed and independently explored.

One example of an illustration of a Nusantara manuscript from Yogyakarta published in the Perpusnas Press publication entitled "Jongensspelen: Permainan Tradisional Anak-laki" (Traditional Games for Boys).

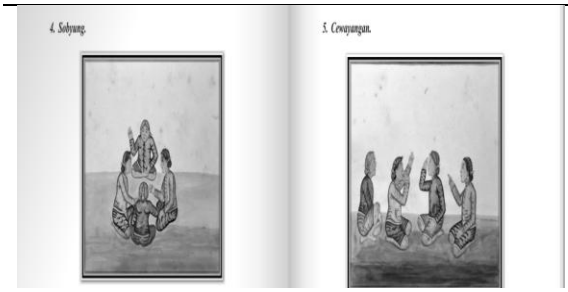
| Ilustration | Form of Visualism |
|---|---|
|   Sumber: https://press.perpusnas.go.id/ | 1. The Sobyung game, a group of boys sit in a circle on the ground, performing hand movements as a game mechanism. The parallel seating indicates a collective, non-hierarchical game, while hand movements determine the outcome and determine whether a player wins or loses.<br>2. The Cewayangan game, characterized by dynamic body and hand movements, as well as children holding specific body parts, such as their foreheads or noses, in response to game instructions. |

Figure 1. Illustration of Jongenspelen: Traditional Boys' Games

The illustrations in the Jongensspelen manuscript: Traditional Boys' Games depict Sobyung and Cewayangan games played by a group of boys sitting in a circle. The arrangement of the images displayed together, along with the presence of important characters, with hand gestures and gaze directions, indicate the dynamics of the game.

These findings are explained using the Digital Cultural Heritage Standards: From Silo to Semantic Web framework. This relates to the Enricher element, which emphasizes the enrichment of meaning through the interpretation of digital objects. The Jongenspelen illustrations can be read as representations of community social practices, embodying the values of collectivity and interaction patterns in traditional games. In practice, this interpretation has not been provided in the Khastara metadata. The information presented is limited to the illustrations in the manuscript, without visual descriptions or meaningful context. More in-depth explanations are found in philological studies, such as those published by the National Library of Indonesia (Perpusnas Press) that include translations and translations. This indicates that enrichment of meaning is available scientifically, but has not yet been connected to the metadata system.

Compared to the Enricher element standard, this situation indicates that illustration management practices have not yet fully integrated meaning into the digital system. Digitization has successfully captured visuals in their entirety, but the interpretive function remains outside the system. This situation results in illustrations being understood more as visual representations, rather than as cultural information that can be utilized analytically. Research by Wirajaya (2017) also emphasizes that preserving Indonesian manuscripts through digitization requires the support of scientific studies and scholarly collaboration to maintain their intellectual value. This aligns with research by Windhager et al. (2018), who also emphasized that digital cultural heritage objects gain greater value when accompanied by interpretive context that helps users understand their social and historical meaning. In this context, Khastara has fulfilled the technical preservation aspect, while the metadata function as a link between digital images and cultural meaning has yet to be optimally developed.

Furthermore, illustrations in the Serat Pawukon Ugi Penanggalan Jawi manuscript, published on the Khastara portal, demonstrate the management of visual information in the digitization of Indonesian manuscripts, as follows.

| Ilustration | Form of Visualism |
|---|---|
|  Sumber: https://khastara.perpusnas.go.id/ (Researcher screenshot, 2026) | The figures are depicted standing and sitting with characteristic gestures, wearing traditional attire. The supporting backdrops, consisting of buildings and trees, are presented simply as spatial markers, without in-depth perspective details, so the main focus remains on the figures and their activities. |

Figure 2. Pawukon Ugi Penanggalan Jawi Fiber

The Pawukon manuscript originates from Java, specifically Central Java. Philologists at the National Library of Indonesia state that the illustrations in Serat Pawukon Ugi Penanggalan Jawi depict human figures in a wayang style with slender postures and distinctive body positions, accompanied by supporting elements such as buildings and trees. The human figures in the illustrations represent character, the cycle of time, and the relationship between humans and the cosmological order in the Javanese calendar system.

Within the framework of the Digital Cultural Heritage Standards: From Silo to Semantic Web, this condition indicates that the illustrations possess a source of cultural information related to the Enricher element, namely the enrichment of meaning through the interpretation of digital objects. The Pawukon visuals can be understood as representations of traditional knowledge systems that address the relationship between humans, time, and the universe. However, this symbolic meaning has not been accommodated in the Khastara metadata and is generally obtained through philological studies. This indicates that the enrichment of visual information remains outside the main system. The Khastara system does not fully meet the ideal standards of the theory used. Metadata still functions at the level of general recognition, not yet providing visual context or cultural meaning to the illustrations. These limitations make the process of interpreting illustrations dependent on sources outside the system, such as philological studies in Perpusnas Press publications containing transliterations and translations. This means that enrichment of meaning is available academically, but not yet directly linked to the digital system.

Research by Wirajaya (2017) confirms that preserving Indonesian manuscripts through digitization requires scientific support to maintain their intellectual and cultural value. This finding is also supported by Hady et al. (2025), who stated that manuscripts function not only as historical documents but also as systems of knowledge and cultural values that are continuously transformed in people's lives. This situation emphasizes the importance of integrating the results of philological studies and metadata systems, so that illustrations do not simply serve as visual representations but can function as cultural information that can be directly accessed and traced.

*Illustration Representation through Khastara Metadata*

The metadata displayed on the Khastara portal contains basic information about Indonesian manuscripts, including title, author, place of origin, language, subject, and physical description. This information serves as a means of identifying collections and providing an

overview of the characteristics of manuscripts in the digital environment (Brandt et al., 2024). The visual information displayed in Khastara does not consistently include illustration details, such as illustration type and specific page location. Consequently, illustrations are not positioned as separate visual entities described in the system.

In managing digital collections, the National Library of Indonesia applies standard metadata such as Resource Description and Access (RDA) for bibliographic descriptions and Machine Readable Cataloging (MARC) as a catalog data encoding format. These standards are designed to ensure consistency and order in describing basic manuscript information. In the context of illustration representation, these standards do not specifically accommodate the need to describe illustrations and illuminations as stand-alone units of visual information (Lorenzini et al., 2021). This finding is reinforced by the following interview results with informants in January 2026.

> *"…Khastara's metadata for illustrations still indicates whether or not an illustration is present." (J)*
> *"Librarians have to open each manuscript one by one to view the illustration." (J)*
> *"The system still operates in a general manner, not specifically for illustrations…" (K)*
> *"The reason there's no specific management for manuscript illustrations yet is because illustrations require more in-depth research…" (J)*
> *"…limited human resources, yes, that's true. So it's not just about competence, but more about the time required for research, which would take longer…" (J)*
> *"…the manuscripts themselves aren't like regular books, so the manuscripts are fragile and difficult to read. Repeated reading will certainly shorten the lifespan of the manuscripts themselves." (D)*
> *"So that's why there hasn't been a specific classification for illustrations yet, so the sections are simple…" (J)*

The findings above indicate that metadata management practices at Khastara have fulfilled the basic function of collection description, especially in the context of manuscript identification and classification. However, when linked to the need to represent illustrations as visual information, this practice remains at a general stage and has not yet reached a level of description that allows illustrations to be independently searched.

Within the framework of Digital Cultural Heritage Standards: From Silo to Semantic Web, this condition is directly related to the Semantic Web element, which emphasizes the importance of metadata connectivity so that digital object information can be recognized as a specific entity within the system. In this study, the aspect of information connectivity, particularly in representing visual elements, remains limited in its implementation. Illustrations lack a metadata structure that allows systems to connect and display specific visual information. This demonstrates that while standards such as RDA and MARC have guaranteed consistent bibliographic descriptions, the level of metadata information does not yet support specific illustration searches. This situation indicates that metadata is capable of presenting collections in a structured manner, but has not yet reached the stage of representing illustrations as elements with their own information access. The ideal standard for Semantic Web elements emphasizes the connectivity of every aspect of information, while in practice, illustrations are still attached to the general description of the manuscript. Consequently, digitized illustrations cannot yet be directly accessed through retrieval systems.

Hendrawati's (2018) research shows that while the manuscript digitization process generally follows technical preservation standards, developing a more specific description system remains a challenge in managing digital collections. Furthermore, Nishanbaev et al.'s (2019) research shows that in digital cultural heritage management, data is often stored in poorly organized and poorly interconnected formats. Therefore, illustration management should not stop at the digitization process; it should also be followed by the development of metadata capable of representing visual information in a more structured manner. This research demonstrates that illustrations need to be placed as an information aspect within metadata, so they can be traced and utilized as part of cultural information within digital systems.

*Roles in Managing Digital Illustrations of Indonesian Manuscripts*

Managing illustrations of Indonesian manuscripts in a digital environment is a collaborative process involving various parties with complementary roles. At the National Library of Indonesia, this management involves librarians, philologists, and a media translation team in separate but integrated work stages.

Librarians play a role in managing digital ancient manuscript information during the post-media translation stage, particularly in compiling metadata using the Resource Description and Access (RDA) standard and MARC format. This role contributes to the order and consistency of manuscript identity information, including title, author, language, subject, and physical description. However, in the context of illustrations, the resulting descriptions are still limited to general information, such as the presence of illustrations, without encompassing visual descriptions or deeper meanings. This indicates that the metadata function is still oriented towards collection identification, rather than specific visual analysis (Fan et al., 2022).

The media translation team plays a role in the initial stage of digital manuscript management, namely the process of visualizing manuscripts through digitization. This team is responsible for producing complete and accurate digital images. The role of the media translation team is technical and documentary, ensuring that all visual elements of the manuscript are properly recorded as a digital archive. The media translation team does not select meanings or group illustrations, but rather focuses on the visual quality of the digitized results as a basis for further management (Fatmawati, 2022).

Furthermore, philologists play a crucial role in providing context to the manuscript's content, including the relationship between text and illustrations. In manuscript management, philologists serve as scholarly references, helping to understand the cultural background and symbolic meanings contained in the text and visuals. Philologists' contributions generally come in the form of studies, transliterations, or separate scholarly publications, such as those published by the National Library of Indonesia (Perpusnas Press). Deeper understanding of illustrations is often derived from philological sources in different systems, rather than from visual descriptions integrated directly into the digital portal (Zhang, 2022). This is reinforced by the following interview results from January 2026.

> *"...so our job in media translation is to ensure that all pages of the manuscript, including illustrations, are recorded clearly and according to standards." (D)*
> *"The meaning of illustrations is usually explained in philological studies, not in portal descriptions..." (J)*

Based on these findings, it can be seen that illustration management at the National Library of Indonesia has been carried out through a clear and complementary division of roles. Functionally, this practice has met the basic needs of preserving and documenting digital manuscripts, both from a technical and scientific perspective. However, when viewed in the context of representing illustrations as information in digital systems, this practice still shows a separation between functions that is not yet fully integrated.

Within the framework of Digital Cultural Heritage Standards: From Silo to Semantic Web, this condition relates to the Enricher element, which emphasizes the role of various parties in optimizing metadata as part of digital cultural heritage management. Based on the findings of this study, the role of enrichment remains separate from the main digital system. Librarians provide general descriptions through metadata, the media translation team focuses on accurate visual recording, while cultural meaning is more present through separately published philological studies. This situation indicates that existing practices have met the collaborative aspect of manuscript management, but have not yet fully achieved the integration of information enrichment as envisioned in the Enricher element. Illustrations have been documented and interpreted, but they are not yet fully connected within the system. Consequently, users cannot simultaneously access the visual display and its cultural meaning.

Wirajaya's (2017) research confirms that digitization is part of a preservation strategy involving various parties with complementary roles. Collaboration between technical managers and scientific actors is a crucial element in maintaining the sustainability of information and the cultural value of manuscripts. Research conducted by Prasad M S (2021) also confirms that in digital cultural heritage management, the difference between technical explanations and cultural understanding can lead to digital objects being understood only technically without capturing their cultural value. This research shows that the main problem lies not in the division of roles, but in the lack of connection between the work of each role in the digital system. Metadata still functions as description, while cultural interpretations have not been accommodated within it. This condition emphasizes the need to develop metadata that not only records basic information but also contains meaningful context, so that illustrations can be used as more comprehensive visual information.

## CONCLUSION

This research shows that the digitization of Indonesian manuscripts at the National Library of Indonesia has progressed well technically, particularly in producing complete and manageable digital images. However, at the information management level, illustrations are still presented as part of the manuscript and have not been treated as visual information that can be accessed independently in metadata. This situation indicates that digitization has not been fully accompanied by the development of metadata capable of representing visual meaning. Illustrations are well documented, but they do not yet fully support the process of searching and utilizing cultural information in digital systems.

This research confirms that in digital preservation, success lies not only in media transfer but also in the ability of metadata to connect visual forms with their meanings. Therefore, strengthening metadata is crucial so that digital repositories function not only as storage but also as information systems that can be accessed and utilized more widely.

## SUGGESTION

In the future, metadata on the Khastara portal needs to be supplemented with clearer descriptions of illustrations, such as the type of illustration and its location within the manuscript. This will help users find visual information without having to open the entire document.

Furthermore, the results of philological studies, such as translation and translation, can begin to be linked to metadata. This way, illustrations appear not only as images but also as easily understood cultural information. Future research can develop a metadata model specifically for illustrations, which can serve as a reference in the management of cultural heritage-based digital collections.

## THANK YOU-NOTE

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