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DIGITALIZATION OF ANCIENT MANUSCRIPTS FROM TUBAN REGENCY AS HISTORICAL SOURCES

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ABSTRACT

Manuscripts are the result of a person's handwriting, which contains various information, including thoughts, community culture, life history, customs in the past, which become a source of historical studies, and so on. Manuscripts in Indonesia are widely scattered throughout the country, including manuscripts in Tuban Regency. Tuban has a solid Islamic history. This is evidenced by the existence of handwritten evidence that contains various ancient manuscript information. Many people need to learn more information about the existence of manuscripts. Until care and preservation are often ignored. This method uses a philological approach focusing on a series of ancient manuscript text studies. Starting at the inventory stage of field study data collection, conservation preservation, digitization, and digital data processing. The manuscript study focuses on the Tuban Regency area by visiting several active institutions such as museums, Islamic boarding schools, and some residents. This study requires a spatial topography to ensure the condition of the manuscripts is realized based on geographical conditions and adjusts to the temperature and light entities. It can be found that some manuscripts need to be revised due to inadequate care. Manuscript preservation efforts have been carried out through various challenges, such as looking at biological, physical, and chemical factors and factors due to human negligence. Involves the challenge of providing the digital world with a place to store information on various kinds of manuscripts.

I. INTRODUCTION

Manuscript, known as *codex* in Latin, manuscript in English, and *handschrift* in Dutch, are cultural heritage items. In Indonesia, these manuscripts come in many different forms. (Djamaris, 2002). Manuscripts are handwritten documents that contain information about people's thoughts, cultures, life stories and customs from the past. They are important historical

sources, along with other non-written cultural remains like temples, mosques and old buildings. Manuscripts are found all over Indonesia, but many are still kept in physical form by people, museums, government offices and private organizations.

Indonesia still has many old handwritten documents, or manuscripts, spread across its many islands. However, the number of manuscripts in each area is different. A large number of Indonesian manuscripts are now in other countries, especially in the Netherlands. During the Dutch colonial period, the Dutch East India Company (VOC) collected and stole these manuscripts for their own purposes. Many of the stolen manuscripts were about Islamic civilization had its origins in the Middle East (Saraswati, 2011).

The Netherlands, when they ruled Indonesia, were very interested in the old handwritten books, or manuscripts, written by Indonesian people. They used these manuscripts to learn about Indonesian customs, traditions and history before they arrived in the 16th century. These manuscripts are kept in places like Amsterdam, Leiden, Delft and Rotterdam. The British also have some Indonesian manuscripts, but not as many as the Dutch. The Dutch have a larger collection because they ruled Indonesia for a longer time (Saraswati, 2011).

As a cultural heritage, special attention is needed to preserve, conserve and study the values contained in old manuscripts. These efforts aim to protect our cultural treasures and create a rich intellectual resource that includes history, language, literature and philosophy. We can use this resource to guide our behavior and our relationships with others and our country. Tuban is one place in Indonesia with many of these old manuscripts. Because Tuban is located on the coast and has a harbor, it was an important place for traders. This makes it likely that these traders also spread the Islamic religion. Therefore, it is no surprising that a lot of Manuscripts can be found in Tuban (Anita, 2014, p. 250). Many of the old handwritten books, or manuscripts, found in Tuban are about Islam. This is because Tuban has many Islamic schools, or pesantren, and because famous Islamic teachers like Sunan Bonang and Asmaraqandi taught there. Most of these manuscripts are written in Pegon script. In fact, Tuban has one of the oldest books written in Pegon. This book was written by Sunan Bonang and is called "Wukuf Sunan Bonang". It was written in the 16th century using a mix of old Javanese and Arabic. This book is actually "Ihya Ulumuddin" by Imam al-ghazzali (Said, 2016, p. 204).

From the manuscript about Sunan Bonang's life, we can see that Tuban was a very important place for the spread of Islam in Indonesia. Sunan Bonang, one of the Nine Saints, was known for teaching Islam in a way that was easy for Javanese people to understand. He used songs, poems and other local traditions to teach about Islam. The manuscript shows that Tuban was a place where people could learn about religion, philosophy and Javanese culture. It was a place where people from different backgrounds could study together peacefully. This book about Sunan Bonang's life is very important because it helps us understand how Islam became part of Javanese culture without changing it too much. The main goal of this manuscript is to explain

Islamic teachings and to show us how religious and non-religious education have developed over time.

The discovery of a manuscript written by Sunan Bonang shows that there are many other important old manuscripts in Tuban that need to be studied. These manuscripts should be protected and preserved because they contain a lot of information about the culture of Tuban people in the past. One way to preserve these manuscripts is by digitizing them. This means making a digital copy of the manuscript. By doing this, it will be easier for anyone to access and study these manuscripts.

II. METHODS

In this research, we used the philological method. This method is the best way to study old manuscripts and check if they are real. There are a few steps in philological research. The first step is to collect information about the manuscripts. We can do this by studying catalogs of manuscripts and by visiting places where the manuscripts are kept (Djamaris, 2002, p. 10). The steps of philology methods are in the following:

The first step in philological research is to find and collect information about the manuscripts. Researchers will go to different places, like people's home in Tuban, where these old manuscripts are kept. Once they find the manuscripts, they will examine them carefully to see what condition they are in. They will then describe the manuscripts and, if needed, they will copy, translate and analyze them. Finally, they will make a digital copy of the manuscript to preserve it for the future.

The second step is to take care of the manuscripts that we found. We will check each manuscript and decide which ones need to be fixed first. This includes cleaning them. We will also teach the owners of the manuscripts how to take care of them in the traditional way.

The third step is to make a digital copy of the manuscripts. This is like taking a picture of the manuscript, but using a computer. By doing this, we can save the information in the manuscript for a long time. This is a common way for people who study old books to preserve them in the digital age.

In the fourth step, we will change the digital images into PDF files. Then, we will use a special program called a "flipping book" to make the digital manuscript look like a real book. Finally, we will save the digital manuscript in a special database at IAINU Tuban so that researchers can use it. To fully understand and accurately describe a manuscript, several steps must be taken. These steps are as follows:

1. Manuscripts Identification

Manuscript identification is the first step in the process of describing a manuscript. On this step, a manuscript will be examined from physical, textual and authorial perspective to determine its origin (Fatoni, 2021).

2. Physical Condition

The physical condition of an ancient manuscript must also be considered during the description process. This includes the type of material used (such as leather, leaves or paper), paper type, watermark, thickness (number of pages, blank pages, written pages and illustrated pages), size, binding and cover.

3. Manuscript Classification

Manuscript classification is necessary to compare one manuscript to another, providing a clear overview of the content and highlighting differences. It is essential for researchers to verify the authenticity of a manuscript and to compare the writing styles of different manuscripts.

4. Cultural and Historical Context

When analyzing manuscripts, it is essential to consider the historical and cultural context in which they were written. Additionally, the arguments presented in the manuscript and the supporting evidence should be identified. Manuscripts are currently facing a significant threat of extinction due to various factors such as climate change, theft and damage from insects and rodents. Moreover, public neglect of these historical artifacts as a result of a lack of understanding of their importance has contributed to their deterioration. Therefore, research on manuscripts is crucial to preserve this valuable historical data.

III. RESULT AND DISCUSSION

1. General Overview of Tuban

Tuban is a city in East Java with many nicknames. Its often called the “City of Saints” because it was once a center for the spread of Islam. People also call it the “Tuak City” because Tuban is famous for producing tuak, a traditional alcoholic drink made from palm sap. With 38 districts and over 1 million people, Tuban is one the largest regencies in East Java (Anonim, 2024).



Picture 1: Administrative Map of Tuban District

Source: <https://tubankab.go.id/page/geografi>

This city is an old city located on the norther coast (pantura) of Java Island, approximately 103 km from Surabaya, the capital of East Java. Astronomically, Tuban City is located at 111.30'-112.35' Eas Longitude (BT) and 6.40'-7.18' South Latitude (LS) with a land area of 1.839.94 km² and a sea area of 22.608 km². The coastline is approximately 65 km long. Administratively, Tuban City is part of the province of East Java and geographically borders several regions including: (Anonim, 2024a)

- a. On the north: Javanese sea
- b. On the south: Bojonegoro district
- c. On the east: Lamongan district
- d. On the west: Blora and Rembang district

Tuban is also surrounded by several bodies of water. To the north, there is the Java Sea. The Bengawan Solo river flows to the south, while the Lohgung River flows to the east and the Sarang River to the west. The central part of Tuban consists of the northern coastal area and the Bengawan Solo River. The city's elevation ranges from 0 meters above sea level along the Pantura road to 500 meters above sea level in the Grabagan district (Penyusun, 2013, pp. 9–10).

Tuban has three aspects of natural conditions as follows:

a. Soil Topography

Most of Tuban's land is dry and infertile. About 5% of the soil is made of limestone, and 34% is made of river sediment. There are also igneous and sedimentary rocks in the districts of Widang, Plumpang, Singgahan, Senori, Bangilan, Parengan, Kenduran and Jatigoro (Setyono, 2014).

According to Anonim (2024a), Tuban's topography can be classified into three elevation zones:

- 1) Lowland areas that are 0 to 15 meters above sea level.
- 2) Hills that are 26 to 100 meters above sea level.
- 3) The mountainous areas, which are more than 100 meters above sea level, can be found in Montong and Grabagan districts.

b. Cimate/Weather

Tuban has a tropical climate. It rains a lot, especially in the north coast where it rains 1400 mm per year for about 69 days. In the Bengawan solo area, it rains even more, about 1600 mm per year for 91 days. Because Tuban is on the north coast, it's usually hot, between 22°C and 33°C. the rainy season is from October to April and the dry season is from May to October. During the dry season, it's very dry with less than 100 mm of rain. (Penyusun, 2021, pp. 76–78).

The area is divided into two parts based on how wet or dry it is. The very dry part is much bigger covering about 97.73% of the total land. The wet part is much smaller, erringing only about 5.7 %.

c. River Flow

Most of the rivers in this area flow to the south and empty into the Bengawan Solo River. These rivers can be found in areas such as Kadangan, Pundungan, Bugel, Kening, Temulus, Kereng, Geneng, Gulakar and Ampel. Additionally, there are rivers that originate from springs in hilly or mountainous regions, including the Klero, Lohgung, Beji, Gayungan, Menengan, Prumpuung, Bagoran, Kesambi and Sarang rivers.

Among the many rivers in Tuban, the areas around in Kereng, Bugel and Keping Rivers are particularly fertile, and they are near the flow that empties into the Bengawan Solo River. As a result, many people have settled in these areas, making them centers fro trade, shipping and the spread of goods and people between different regions.

In the past, Tuban was a strategic area as a trade route in the history of the Nusantara archipelago. During the spread of Islam on the Island of Java, Tuban's strategic position as a trade route led to its development as a major port connecting the Nusantara with foreign traders from Gujarat, Arabia, China and various Southeast Asian countries (Himmah, 2020, pp. 4–6).

The spread of Islam in the northern part of Java was also centered in Tuban, with the presence of Walisongo figures there, one of whom was Sunan Bonang. His tomb, located in the center of Tuban city, a historical trace of the spread of Islam in this city. Sunan Bonang, a prominent walisongo figure, is believed to be the main figure in the spread of Islam in Java. Until today, his tomb remains a popular pilgrimage site.

Through the roles of these wali (Islamic saints), Islam was able to develop in Tuban society and influence their way of life. Many things changed, such as local traditions that contradicted Islamic teachings. However, these traditions were actually created by the wali as a way to spread Islam by adapting it to the existing culture. These traditions are still preserved today (Syam, 2005, p. 70).



Picture 2: Courtyard of the Ancient Mosque in the Sunang Bonang Tomb Complex
Source: https://www.tripadvisor.co.id/LocationPhotoDirectLink-g7377542-d3219034-i289943264-Sunan_Bonang_Tomb-Tuban_East_Java_Java.html

Besides being the gateway for the spread of Islam in the northern part of Java, the port of Tuban also became the entry point for various foreign cultures, making Tuban a center for cultural diffusion. This is evident in the presence of various worship places for different religions, such as the grand mosque near the Tuban square, representing Islam, a church representing Christianity and a temple representing Confucianism (Chinese).

The spread of Islam in Tuban was facilitated by scholar who used manuscripts as a teaching tool. These scholars often established pesantren, Islamic boarding schools, where students could seek knowledge. Pesantren have played a crucial role in preserving Islamic knowledge through these handwritten manuscripts, which cover a wide range of Islamic disciplines.

Beside being kept in Islamic boarding schools, some manuscripts are also kept by ordinary people. These people usually get the manuscripts from their ancestors and don't know much about them. They often think that the manuscripts are just old books with some strange words because they can't understand the language.

Through digitalization programs, it is hoped that people, especially those in Islamic boarding schools, can gain a better understanding of the importance of existing manuscripts. Additionally, it is hoped that these manuscripts can be revitalized and preserved for future generations.

2. Tuban's Pesantren Manuscripts

Manuscripts and pesantren are two inseparable entities. Historically, the emergence of pesantren coincided with the arrival of preachers who spread the teachings of Islam. Over time, as Islamization progressed, Muslim communities formed. According to Dewi Evi Anita, pesantren were the origins of numerous manuscripts containing Islamic teachings in Southeast Asia, particularly in Tuban (Anita, 2014, p. 247). Located on the northern coast, Tuban was a frequent stopover for preachers who were also merchants. Archaeological evidence, such as the tomb of Sunang Bonang and the discovery of ancient Islamic learning, often referred to as the 'Land of the Wali' (Said, 2016, p. 204).

The title 'Bumi Wali' (Land of the Saints) given to Tuban is not merely a title but is supported by the discovery of numerous tombs of Islamic saints in the region. Some of these include the tombs of Sunan Bonang, Syekh Ibrahim Asmoroqandi, Sunan Bejagung, Mbah Jabbar, Mbah Punju; (jatigoro) and Makam Ploso (Senori) (Himmah, 2020, pp. 33–40). Given the presence of these tombs of Islamic preachers in Tuban, it is not surprising that numerous ancient manuscripts can be found in the area, many of which are carefully preserved in old pesantren. Tuban's pesantren manuscripts represent a rich cultural heritage, reflecting centuries of Islamic educational traditions in the region. Located in East Java, Tuban is renowned as one of Indonesia's centers of pesantren education. These manuscripts cover a wide range of topics, from religious teachings to history and social practices associated with pesantren life (Mustaqim, 2016, pp. 45–60).

Tuban pesantren's manuscripts are often written in Arabic and Javanese, reflecting the common use of these two languages in Islamic education. The script predominantly uses Arabic script, it is known as Pegon script (Sujiyanto, 2019). The manuscripts are typically well-organized into chapters, making it easy for readers to understand the content and context of the teachings. The content of these manuscripts is diverse, with many focusing on fiqh (Islamic law), tasawwuf (Sufism) and akhlaq (ethics). Additionally, there are manuscripts that discuss the history of pesantren, biographies of Islamic scholars and Islamic literature (Hasyim, 2017). This demonstrates the significant role of pesantren as educational institutions that not only teach religious knowledge but also shape the character and morality of their students.

3. Tuban's History

The name Tuban originated from a freshwater spring found approximately 10 meters from the coastline. Uniquely, despite being close to the sea, the water source remained fresh. Due to this phenomenon, the water source was named 'metu banyu' (meaning 'emerging water'), and subsequently, the place was named Tuban (Saifudin, 2016, p. 5). Before being named Tuban, this place was called Kambang Putih. This name was derived from the appearance of Tuban's land when viewed from the sea, resembling a floating white stone (Soeparno, 1983). The Chinese people referred to Tuban as Duban or Chumin.

Human life in Tuban has been ongoing for a long time, even since prehistoric times. Prehistoric humans preferred to live in caves located in rocky, karst regions because these places were ideal for building settlements in the prehistoric era. Many caves have been found in Tuban, according to a survey conducted by the National Archaeological Research Center in 1989. This research also indicates that human life has been present in Tuban for a long time, as evidenced by the numerous caves that were used as settlements by prehistoric humans located in various places. The first location where prehistoric human caves were found is in Semanding. There are many caves in this area, including Gua Akbar, Gua Gedhe, Gua Butul, Gua Pawon, Gua Sumur, Gua Gragas, Gua Pnggung, Gua Peteng, Gua Gembul, Gua Bagong,

and Gua Cilik. In the second location, Montong, about four caves have been found: Gua Lawa, Gua Terus, Gua Suruh, and Gua Clangap. The next location is in Palang, where Gua Suci is located, and in Plumpang, there is Gua Song Prahuh. The last locations are Gua Regel and Gua Gedhe (Ernawan, 2001).

Each cave found in Tuban contains remnants of prehistoric life, indicating that these caves were once inhabited by prehistoric humans in the Tuban area. For example, in Gua Terus, there have been discoveries of prehistoric artifacts such as large bronze drums, bronze axes, bronze spears, and the remains of ancient animals (Urokhim, Sumardi, & Wahyudhi, 2023). In Gua Song Prahuh, there is an ancient boat that has been inhabited by prehistoric humans since around 7000 BC. Additionally, there have been discoveries of pottery, suggesting that this cave was not only used as a temporary shelter but also as a burial site, dating back to the time when people started farming and engaging in metalworking. The prehistoric findings in Tuban, particularly in the districts of Semanding, Montong, Plumpang, and Rengel, have played a significant role in the lives of ancient humans. Their survival was supported by the surrounding resources, such as the sea and land, as evidenced by the presence of seashells found inside the caves (Triwunjani, 2001).

Around the 11th century, during the Hindu-Buddhist period, Tuban had become a major trading center in Java. It had been a commercial city since the 11th century, and during the Airlangga Kingdom, Tuban even became an international trading center. At that time, the Airlangga Kingdom had trading ports in Hujung Galuh and Kambang Putih. The Airlangga Kingdom's port in Mojokerto served as a place for trading goods that were sent to other islands, and before returning to their respective destinations, the ships were loaded with agricultural products. The second port was located around the Tuban area (including the current Tuban area). An inscription issued by the Airlangga Kingdom mentioned that foreign traders from North and South India, Cambodia, Ceylon, and Champa had been trading in the Tuban port (Sedyawati, Manus, & Supratikno, 1997).

In 1292, a Chinese-Mongol army invaded East Java and landed on the shores of Tuban. This event became one of the factors in the formation of the Majapahit Kingdom (Abdullah, 2015, pp. 35–38). The kingdom had high hopes for the development of the city of Tuban, and the port was used by the Majapahit Kingdom as a means to achieve both political and economic success. Tuban's port experienced rapid development in the 13th century, during the Majapahit Kingdom, when it became a central meeting place for traders from various regions and countries. Additionally, Tuban was used as a place to export goods from various countries. Majapahit became one of the wealthiest empires, and it is a fact that during that time, the Majapahit Kingdom experienced a golden age. Even Chinese traders acknowledged the wealth of the Majapahit Kingdom. During this period, Tuban was under the leadership of Adipati Ranggalawe. The port of Tuban had already existed since the Hindu-Buddhist period and had become a famous international port (Ningrum, 2018).

The weak influence of Islam on the coast of Tuban was one aspect of the spread of Islam in the Nusantara archipelago. The spread of Islam in Tuban was inseparable from the role of the Wali Songo, who spread Islam in Java. The spread of Islam began around the coastal areas of Tuban because many tombs of key figures in the spread of Islam were found in these coastal areas. In the 11th century, Tuban became the busiest city, visited by many traders and preachers who spread Islam throughout the islands. Some of the figures who spread Islam in Tuban were Syekh Ibrahim Asmoroqondi, Sunan Bonang, and Syekh Abdullah Asy'ari, often known as Sunan Bejagung.

The journey of Syekh Ibrahim Asmoroqondi began when his father, Syekh Jumadil Kubro, who was preaching in Asia at that time, asked him to go to Asia, specifically to Champa. Syekh Ibrahim Asmoroqondi went to Champa and married a Cham woman, and they had two children named Raden Ali Rahmatullah and Raden Ali Murtadlo. From this coastal area, Syekh Ibrahim Asmoroqondi began his preaching, using the same coastal preaching method employed by the Wali Songo in Indonesia to spread Islam. From these coastal areas, Islamic teachings began to penetrate inland areas. This strategy had long been used by Syekh Ibrahim Asmoroqondi, who preached from coastal areas and then established settlements. Syekh Ibrahim Asmoroqondi taught about a strong *tariqa* and *pesantren*, and he also emphasized the saying "RUU lisan": "What is said must be proven by action." However, Syekh Ibrahim Asmoroqondi did not live long, as he fell ill and died while his preaching journey in Tuban had been ongoing for 15 years, from 1410 to 1425 AD. He was then buried in the village of Gesikharjo, Palang, Tuban (Anwar & Afriyanto, 2022).

Besides Syekh Ibrahim Asmoroqondi, Sunan Bonang was also one of the spreaders of Islam in Tuban, as evidenced by the existence of Sunan Bonang's tomb in Tuban (Warsini, 2022). The presence of Islam in Tuban was very well received, thanks to the role of Sunan Bonang as one of the Wali Songo who used a cultural approach in his preaching. The Kalpataru relic, which is associated with Sunan Bonang, is a symbol of interfaith harmony at that time. This Kalpataru has ornaments with four steps, indicating Islam's openness to local religions and pre-Islamic beliefs. Sunan Bonang's preaching approach emphasized the harmony between Islam and local culture. For example, in building architecture, there are symbols that represent various beliefs. Mosques symbolize Muslims, while temples and *candi* symbolize other religions that existed before. This reflects the values of tolerance and harmony that were upheld by the people of Tuban in the 15th to 16th centuries. The cultural approach implemented by Sunan Bonang was very effective because it did not force change, but rather introduced Islam gently through traditions that were familiar to the people of Tuban. This made Islam accepted well and became part of their daily lives, making Tuban a diverse yet harmonious region.

During the Dutch colonial period in the 20th century, the Dutch colonial government implemented policies that determined the hierarchy and function of regions on the island of Java, including the division and role of ports. These policies had a significant impact on the economic development of the regions, including Tuban. At that time, the port of Tuban experienced a significant decline in its role. One of the reasons was the increasingly shallow condition of the port, making it no longer suitable for large ships. In addition, Tuban's past history as an important port had faded with colonial policies that prioritized ports in other areas for major economic activities. As a result, Tuban only served as a port for small-scale community activities and did not play a role in large-scale trade (Hartono & Handinoto, 2005).

Around the early 1900s, the Tuban region achieved prosperity through the development of a homogeneous society. The people of Tuban at that time experienced rapid growth in various aspects of life, including economics, social, and culture. The homogeneous social condition, where people shared similar customs and cultures, supported the creation of strong cooperation and stability among them. This prosperity was not only supported by the trade sector in the port but also by agriculture, crafts, and local trade. These factors kept the economy of the people of Tuban alive and growing (Ningrum, 2018).

After the end of the colonial period, the economy of Tuban began to improve with the establishment of various industries and factories in the area. The development of the industrial sector, including the Semen Indonesia cement factory and the mining and lime industries, marked the beginning of a major change in the economic and social structure of the

community. Previously, most of the people of Tuban depended on fishing as their livelihood. However, with the establishment of many factories, people began to shift from fishing to industrial jobs. This shift created changes in rural life, with more and more people moving to factory jobs which offered greater income stability than fishing. This progress had a significant impact on Tuban's economic structure, strengthening the local industrial sector, and creating new jobs for the surrounding community. These changes not only improved the standard of living for most people in Tuban but also changed their social patterns, where dependence on marine resources shifted to the industrial sector (Styawan, 2020).

4. Tuban's Manuscripts Condition

a. Manuscripts Kept in the Museum

Manuscripts in museums are often priceless treasures that hold knowledge, history, and culture from the past. The condition of manuscripts stored in museums is greatly influenced by various factors, including conservation methods, storage, and maintenance practices implemented by these institutions.

One of the main factors that affect the condition of manuscripts in a museum is the conservation and preservation efforts undertaken by experts. Manuscript conservation is a complex process that requires in-depth knowledge of materials, techniques, and environmental conditions that can affect such documents. Conservators work carefully to ensure that manuscripts remain in good condition and are protected from further damage.

The conservation process begins with a detailed examination of each manuscript. Experts examine the paper, ink, and other materials used in the creation of the manuscript to identify the types of damage that may have occurred. Some manuscripts may have been damaged due to exposure to light, humidity, or insect attacks. This damage can cause the text to fade or disappear, and the paper to become brittle and easily torn.

After identifying the damage, repair steps are carried out carefully. One common technique used is deacidification, which aims to remove acid from the paper that can cause further damage. In addition, physical repair processes, such as patching tears and strengthening brittle paper, are also often performed. Conservators use materials that are compatible with the original manuscript and non-destructive techniques to ensure that these repairs do not alter the original character of the manuscript.

Another very important factor in preserving manuscripts in museums is a controlled storage environment. Manuscripts must be stored in stable temperature and humidity conditions to prevent damage caused by environmental changes. Storage rooms are often equipped with advanced temperature and humidity control systems, designed to maintain ideal conditions for manuscripts.

Temperatures that are too high or too low can cause paper to become brittle and ink to fade. High humidity can lead to the growth of mold, while low humidity can cause paper to become dry and brittle. Therefore, maintaining the right balance is very important. Generally, the ideal temperature for storing manuscripts is between 18-20 degrees Celsius, with a relative humidity of around 40-50%.

Besides temperature and humidity, light is also a crucial factor that needs to be considered. Exposure to light, especially ultraviolet (UV) rays, can cause the ink and pigments in manuscripts to fade. Therefore, manuscript storage rooms are often equipped with controlled lighting and UV filters to protect documents from light damage.

Manuscripts in museums are often stored in special boxes or folders designed to protect them from dust, dirt, and physical damage. These storage boxes are made of acid-free materials and have a design that allows for good air circulation, preventing moisture

buildup inside. In addition, each manuscript is usually equipped with an identification tag that lists important information such as the title, author, and date of creation, facilitating cataloging and searching.

Manuscripts are also stored on shelves or in cabinets specially designed to accommodate various document sizes. Some manuscripts may need to be stored horizontally to avoid pressure that can damage the spine or binding. Additionally, vertical storage with proper supports can also be used for smaller or stronger manuscripts.

Manuscript accessibility is another important aspect that needs to be considered. Museums often have strict policies about who can access manuscripts and how they can be used. Researchers or visitors who want to view manuscripts usually have to submit a request in advance and follow strict rules to ensure that the documents remain protected. The use of gloves and special tools, such as reading boards and supports, is often required to prevent physical damage during handling.

To make old handwritten documents (manuscripts) easier to access and protect them from being damaged, many museums are creating digital copies. They do this by scanning the documents at a very high resolution to make perfect digital copies that can be seen online. This not only makes it easier for researchers and the public to learn about the information in these old documents but also helps to preserve them for a long time.

Digital copies of manuscripts can be stored in a secure server and accessed through an online database. With a digital platform, researchers from all over the world can access manuscripts without having to travel to the museum physically. In addition, digitalization also allows for the storage of several backup copies that can be used if the original manuscript is damaged or lost.

It's really important to keep good records of everything we do with these old handwritten documents. This includes any repairs, cleaning, or making digital copies. These records help us keep track of how the documents are doing over time and give future experts information they need. Good records also make it easier for historians and researchers to do their work.

This also happens in the process of saving old handwritten documents (manuscripts) done by Kambang Putih Museum in Tuban. Kambang Putih Museum is a museum that has historical objects inside and is part of the historical value. This museum has several collections of manuscripts, one of which is *serat pandalangan* and *serat sekar macapat*. Both manuscripts are historical relics that are neatly stored in the museum.

Besides keeping and preserving manuscripts, the Tuban museum also plays a curical role in educating the punlic about the historical and cultural value of these manuscripts. Manuscript collections are often held to introduce the public to the wealth of information contained in ancient manuscripts. These manuscripts not only display manuscripts but also provide historical and cultural context that helps visitors understand the importance of these manuscripts.

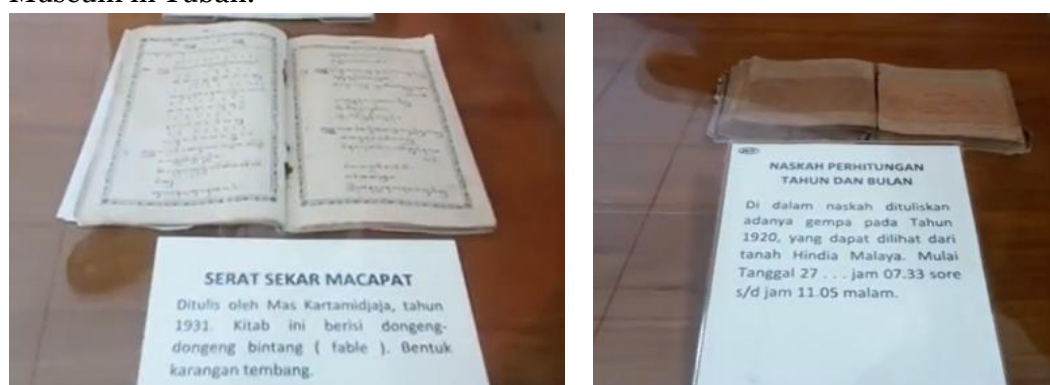
Manuscripts collections are typically accompanied with detailed explanations, including information about the author, the history of its creation and the social context of the place where the manuscript originated. In addition, Manuscript collections in Kembang Putih museum allow visitors to closely examine the manuscripts and read accompanying explanations without touching the original manuscripts.

It is hoped that the displayed collections can educate visitors. This can also be done through special programs such as workshops, seminars, and public lectures. These programs aim to increase public awareness of the importance of preserving manuscripts and to provide knowledge on how to read and understand ancient documents. Through

education, the Tuban Museum can build greater appreciation for the cultural and historical heritage contained in manuscripts.

Collaboration between various parties is very much needed. Cooperation between the government, cultural institutions, universities, and international organizations can bring additional resources and knowledge needed to preserve manuscripts. In addition, active participation from the community is also very important. Public awareness and support can drive preservation efforts and ensure that the cultural heritage housed in the Tuban Museum is preserved for future generations.

Therefore, the condition of manuscripts in a museum is influenced by various factors, including conservation efforts, storage environment, and accessibility. Through the right steps and good cooperation, we can ensure that ancient manuscripts remain protected and accessible to the public. In this way, the cultural and historical heritage contained in these documents can continue to live on and provide valuable insights for future generations. The following are the manuscripts stored in the Kembang Putih Museum in Tuban:



Picture 3: Manuscripts in the Museum

Source: Personal Documentation

b. Manuscripts Kept by the Community

People who generally don't know about manuscripts often don't realize the importance of these old documents. Manuscripts, which are handwritten documents or documents made before mass printing, contain a lot of valuable information about history, culture, and knowledge from the past. However, a lack of knowledge about manuscripts can impact the preservation and use of this cultural heritage. Some people will only store them without regular follow-up, either in terms of preservation or proper care.

In many communities, manuscripts may be stored in less than ideal conditions. Some manuscripts are stored in places where the temperature is not controlled, such as in wooden cabinets or even under beds. High humidity and drastic temperature changes can damage paper and ink, making manuscripts fragile and difficult to read. Mold and insects are also often a serious threat to the physical condition of manuscripts, as they can quickly damage paper.

Some of the reasons for community unawareness about manuscripts stem from limited accessibility and education. Many people lack the ability to read or interpret manuscripts because the languages used are often difficult to understand. These languages differ significantly from everyday communication and typically employ a writing style distinct from modern usage. Therefore, specialized knowledge is often required for comprehension.

When asked about manuscripts, community members often express confusion and a lack of understanding. They often perceive manuscripts as solely relevant to historians and academics, believing they have no direct connection to their own lives. In reality, manuscripts are treasure troves of information that offer valuable insights into their ancestry, traditions, and the values passed down through generations.

The community's lack of unawareness doesn't mean their fault about the manuscripts. Perhaps due to the lack of literacy and unfavorable circumstances let the community members unaware regarding the manuscripts. it is important for us to take the lead in preserving these manuscripts by following the right procedures and methods.

Moreover, these preservation efforts are often restricted by a lack of knowledge and resources. Not everyone has access to modern technology or experts who can teach them the best way to preserve a manuscript. This means that even in people want to help, the result is not always optimal.

But there's hope to change this. Education programs that involve the community in preserving and studying these old writings can help people understand why they're important. For example, schools can take students to old libraries or teach people how to read and understand these manuscripts. This will help students and everyone else appreciate their cultural heritage more (Gandhawangi, 2022).

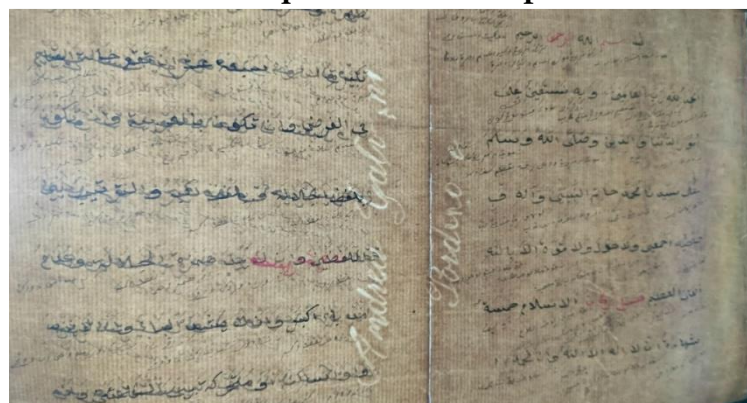
Also, using new technology can help make these old writings more popular. By making digital copies of these manuscripts, people can easily read them online. With easy-to-use websites, people can read and learn about these manuscripts without worrying about damaging the real ones.

It is equally important to involve community leaders and religious figures in raising awareness about manuscripts. They often hold significant influence within their communities and can help disseminate information about the importance of manuscript preservation. With their support, the message about the significance of manuscripts can be more effectively conveyed to the public.

In conclusion, raising public awareness about manuscripts requires a comprehensive and collaborative approach. Through education, technology, and community engagement, we can ensure that ancient manuscripts are valued and preserved as essential components of our cultural heritage. By doing so, the public can appreciate the immense value of these documents, not only as historical records but also as bridges connecting the past to the present.

Through the lens of codicology, a branch of philology, we can identify several catalogued manuscripts

b.1 Fiqh Book Manuscripts



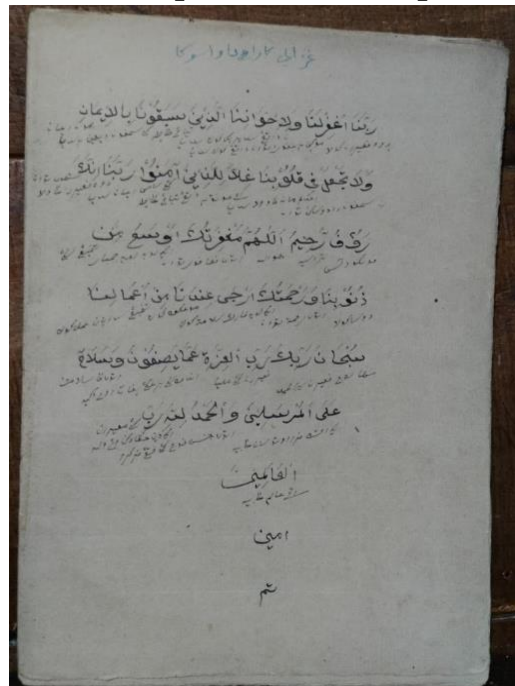
Picture 4: Fiqh Book Manuscript 1
Source: Personal Documentation

The manuscript depicted in Image 4 comes from a community in Tuban, specifically from Karangdowo Hamlet, Sanding Dowo Village, Soko District, Tuban Regency. This manuscript is a Fiqh book titled "*Salam Safinah*". Measuring 0.4 cm in thickness, 23.7 cm in length and 17.7 cm in width. the manuscript is written in Arabic and Pegon in prose form, with black ink and red rubrics.

On the watermark features a crescent moon within a shield with the countermark AG. This feature is in good condition though incomplete due to the missing cover. The manuscript is bound using threads with 46 pages long including 6 empty pages. The paper used is Italian, with 9 thick lines and 8 thin lines per centimeter. The exact year of writing and copying is unknown.

The summary of this manuscript contains the fundamentals of Islamic law, with a particular discussion of purification, prayed and zakat. It offers the core principles of Islamic jurisprudence, primarily adhering to Shafi'i madhab. The content it characterized by concise explanation of various fiqh rulings.

b.2 Fiqh Book Manuscript



Picture 5: Fiqh Book Manuscript

Source: Personal Documentation

The origin manuscript depicted in Image 5 from the same location, titled "*Sulam at-taufiq*". The manuscript was completed on Thursday, Kliwon, according to the Javanese calendar. It measures 0.6 cm in thickness, 23.7 cm in length, and 17.7 cm in width. The paper is ruled with 9 thick lines and 8 thin lines per centimeter.

The manuscript is written on Italian paper with a consistent watermark featuring a crescent moon within a shield. It contains 80 pages in total. The number of lines per page varies: 6 lines for pages 1-20 and 9 lines for pages 20-80. The script is a combination of Arabic and Pegon, written in black and red ink. The manuscript is in relatively good condition, although there are some signs of mold and water damage.

The manuscript primarily discusses issues related to Islamic creed (aqidah), monotheism (tauhid), Islamic jurisprudence (fiqh), and Sufism. It includes discussions on faith, belief, heaven, hell, angels, jinn, and other metaphysical concepts. The manuscript concludes with a supplication for the completion of the manuscript.

c. Islamic Boarding School Manuscripts

Manuscripts in Islamic boarding schools (pesantren) are often invaluable assets that reflect the deep knowledge, traditions, and history of the institution. Pesantren, as traditional Islamic educational institutions in Indonesia, have served as guardians and disseminators of religious knowledge for centuries. The manuscripts housed in pesantren typically cover a wide range of disciplines, including theology, Islamic law, history, literature, and natural sciences.

The condition of manuscripts in Islamic boarding schools (pesantren) varies greatly, depending on the care and effort put in by the school's management. Some schools have realized the importance of preserving manuscripts and have taken steps to protect and care for these documents. However, many schools still face significant challenges in maintaining the condition of their manuscripts.

One of the biggest problems is where the manuscripts are kept. Many Islamic boarding schools are in places that are very humid and have big changes in temperature. This is bad for the old books. When it's too damp, mold can grow and ruin the paper. If it's too hot or too cold, the paper can become very fragile and break easily. In some schools, the books are kept in wooden cabinets or on shelves that don't have any special controls to keep the temperature and humidity just right.

In addition to that, insects like termites and booklice are a big threat to the old books in Islamic boarding schools. These insects can eat the paper and ink, making the writing hard to read. Sometimes, people use chemicals to kill the insects, but they aren't always careful, and the chemicals can damage the books even more.

The manuscripts in Islamic boarding schools are often used as textbooks references by the students and teachers. using these old books all the time can damage them, especially without proper care. Reading and touching manuscript frequently with no proper protection will cause torn, folded or dirty manuscripts. Also, the ink on the manuscripts can fade over time, making the writing hard to see.

There is also a big problem with accessing manuscripts in Islamic boarding schools. Many of these old books are kept by the teachers and not shared with other people, like researchers. This means that the important information in these books is hard for others to learn about. The main reason for this is that there aren't good lists or records of these manuscripts.

To solve these problems, some Islamic boarding schools have started to make digital copies of their old books. This is a new way to keep these books safe. By making digital copies, the schools can let more people see the books, even if the original books can't be easily accessed. This also helps to protect the information in the books from being lost or damaged. The schools are also working with other organizations, like national libraries and universities, to get help with making these digital copies. These organizations provide the tools and training needed.

Old manuscripts are also used as textbooks in some Islamic boarding schools. Using these manuscripts in teaching creates a deep appreciation for their content and historical context. By understanding old manuscripts, students not only learn about religion and culture from the past, but they also learn to appreciate the efforts of past scholars in spreading knowledge and preserving Islamic values. This helps to continue the tradition of Islamic learning in Indonesia.

Several Islamic boarding schools have taken steps to preserve their old manuscripts. One of the methods they use is to create digital copies of these manuscripts. This was also done at Al-Ittihad An-Nawawi Islamic boarding school in Rengel district, Tuban regency.

On July 20-21, 2024, more than 20 complete manuscripts were digitized. This digitization process was done in collaboration with a team from the National Research and Innovation Agency (BRIN) (Anonim, 2024b).

Preserving old manuscripts in Islamic boarding schools is a difficult but important task. Despite the many challenges they face, these schools remain committed to protecting this intellectual heritage. These efforts show how important the role of Islamic boarding schools is in preserving Islamic culture in Indonesia, and they also show their sincerity in safeguarding Islamic knowledge for future generations.

5. Manuscripts and Histrocity of Tuban

a. Attention Factor

1) The State of Community in Tuban Regarding Preservation

Preservation is an important activity for researchers to care for and protect ancient manuscripts or manuscripts that are scattered in various regions and often found in the wider community. Preservation is also called preservation, which is an effort to maintain and extend the life of a culture such as the remains of ancient manuscripts. Through these preservation efforts, the aim is to enable the next generation to enjoy the legacy of cultural heritage (Pinton, 2023). One way to preserve old books and writings is by making digital copies of them. This is called digitization. By making digital copies, we can protect the original books from getting damaged. Digitization is important because it can help save these old books from being worn out or destroyed. To do this well, we need to work together with the people who own these old books and with experts who know how to preserve them (Smith, 2015).

There are hundreds of ancient manuscripts scattered throughout the Tuban region. These manuscripts have been found in various communities. The fact that these manuscripts are scattered among the people poses a unique challenge in preserving them. This is due to a lack of public awareness and knowledge about the cultural values and importance of ancient manuscripts. In many communities, people view ancient manuscripts as mere heirlooms passed down from their ancestors without realizing their relevance to daily life. This issue becomes very important when people don't realize the values contained within these ancient manuscripts. A lack of sensitivity towards ancient manuscripts can lead to a decline in interest in studying them, resulting in physical damage to the manuscripts. The knowledge of history, culture, literature, and philosophy contained within these ancient manuscripts would then be lost (Unesco, 2003).

Ancient manuscripts play an important role in determining community's identity. If younger generation does not recognize ancient manuscript, they will lose access to their own cultural identity. The knowledge within the manuscripts will be ignored if younger generation cannot appreciate the existence of such manuscripts. Disregard for the existence of ancient manuscripts will lead to a decline in research in history, literature and culture, thus reducing our standing of these manuscripts (Anonim, 2023).

Education about the importance of ancient manuscripts should be carried out among the general public, especially those who own these manuscripts. Involving cultural figures to explain the values contained within these manuscripts can encourage younger generations to learn about them. Community involvement is crucial in preserving ancient manuscripts. Since these manuscripts originate from the community, it's best if they remain within the community. In this case, community

participation is essential to protect and preserve this cultural heritage for future generations (Smith, 2015).

2) The Role of Local Government

The Tuban district government plays a very important and varied role in preserving ancient manuscripts. This is because Tuban is a region with a rich history and has been a center of Islamic civilization and culture in East Java for centuries. Ancient manuscripts in Tuban not only record the history of Islam but also local history, cultural traditions, and the intellectual development passed down by scholars and ancestors. The Tuban district government is committed to protecting and preserving this valuable heritage as part of an effort to protect the cultural identity and history of the local community. The preservation of ancient manuscripts in Tuban is carried out through various programs, ranging from data collection, conservation, and digitization to public education to raise awareness (Disbudpar, 2022b).

The first step taken by the Tuban district government in preserving ancient manuscripts is data collection. Through the Tuban Culture and Tourism Agency, the government has worked with educational institutions, cultural communities, and Islamic boarding schools to identify and catalog manuscripts still existing in the Tuban region. Many ancient manuscripts are stored in Islamic boarding schools, the homes of community leaders, or the descendants of scholars in Tuban. This data collection is crucial to determine the quantity, condition, and storage location of ancient manuscripts, so that the government can later prioritize preservation programs. In this data collection process, the government often involves philologists or manuscript experts to conduct initial studies of these manuscripts so that their contents can be understood and studied. The results of this data collection are expected to become a complete information base on the wealth of ancient manuscripts in Tuban (Setyowati, 2022).

After collecting data, conserving the manuscripts is the next important step in preserving these ancient texts. The Tuban government is working to ensure that ancient manuscripts found in poor physical condition can be repaired or at least stabilized to prevent further damage. This conservation process involves special care such as cleaning the manuscripts from dust and dirt, repairing torn pages, and treating damage caused by humidity. The government also provides training for people involved in preserving the manuscripts so that they understand the correct care methods. In addition, the Tuban district government has established several safer storage centers with temperature and humidity control facilities to protect the manuscripts from environmental exposure that can accelerate damage. This conservation program is very important because the physical condition of ancient manuscripts is often fragile, and without proper treatment, the manuscripts can experience more severe damage and become unreadable (Wibowo, 2022).

In addition to conservation, the Tuban district government is also actively digitizing ancient manuscripts as a more efficient and widely accessible form of modern preservation. Digitization involves scanning ancient manuscripts into digital form so that the contents of the manuscript can be stored in a file that is safer from physical damage. Digitizing these manuscripts also allows the contents to be accessed by the general public, including researchers, students, or academics who want to study the contents of the manuscript without having to physically hold or see the manuscript. Through cooperation with the national library or universities, the Tuban government has facilitated the digitization of several existing ancient manuscripts, and the results

are stored in a digital repository that can be accessed in a limited or public manner, depending on the applicable policy. This digitization process is expected to extend the life of the information contained in ancient manuscripts and protect its contents from the risk of damage (Setyowati, 2022).

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Cooperation with various parties is also key to the success of preserving ancient manuscripts in Tuban. The Tuban district government has partnered with other institutions such as the National Library, National Archives, universities, Islamic boarding schools, and cultural communities to carry out preservation programs. This cooperation covers various aspects, such as technical assistance in conservation and digitization, training for local staff, and funding support for the procurement of necessary equipment and facilities. In addition, collaboration with academics and researchers from universities also helps the government in studying and interpreting the contents of the manuscripts, so that the information contained therein can be better understood and published. The government also works with local communities to increase access to ancient manuscripts, especially for people who have manuscripts at home so that they are motivated to take care of them.

The role of the Tuban district government in preserving ancient manuscripts is also reflected in the budget support provided for various preservation programs. Although the available budget is sometimes limited, the Tuban government tries to allocate funds for manuscript preservation activities, both through the local budget and through cooperation with national or international institutions that care about preserving cultural heritage. These funds are used for various purposes, such as manuscript care, procurement of storage facilities, and the holding of socialization and education activities. With this budget, the Tuban district government can implement preservation programs more optimally (Disbudpar, 2022a).

Overall, the role of the Tuban district government in preserving ancient manuscripts involves various aspects, ranging from data collection, conservation, digitization, socialization, inter-agency cooperation, to budget support. Each of these steps demonstrates the government's commitment to preserving the cultural and historical wealth of Tuban. With these comprehensive efforts, it is hoped that ancient manuscripts, which are part of the cultural identity of the people of Tuban, can be preserved and passed on to future generations. Moreover, the preservation of ancient manuscripts in Tuban is not only an effort to protect old papers but also as a tribute to the ancestors and intellectual traditions that are an important part of the nation's history. These efforts also show that the Tuban district government greatly values and

cares about the intellectual and cultural heritage that is valuable for the future of Indonesia.

3) The Role of Researchers and Academics

Researchers or academics play an important role in preserving ancient manuscripts or texts because of their expertise in understanding, analyzing, and interpreting texts that have high historical, cultural, and scientific value. Academics from various fields, such as philology, history, anthropology, and library science, contribute to preserving ancient manuscripts with diverse approaches. Preserving ancient manuscripts requires not only physical handling but also a deep understanding of their content so that the message contained therein can be understood by the next generation. One of the main contributions of academics is to inventory and catalog manuscripts.¹ With an inventory, the existence of ancient manuscripts can be recorded in detail based on location, owner, language, script, and content or theme. This process involves a lot of observation, analysis, and documentation to ensure that these manuscripts are well-documented and their information can be accessed by other researchers or the public who need it (Herlambang & Pramono, 2022).

Besides making lists of the manuscripts, researchers also help in taking care of these old books. They teach people who have these books, like religious schools, museums, and libraries, how to properly look after them. These researchers know how to keep the books from getting damaged by things like heat and humidity. They also know how to clean the books carefully and how to handle books that are already falling apart. Scientists who study chemicals and materials can suggest special ways to keep the books from getting old too fast. Sometimes, these researchers even help to fix very damaged books. They do this very carefully so that the books still look the same and say the same things. Researchers are also trying to find new ways to keep these books safe, like using special new materials or technology that can help the books last longer without damaging them (Disbudpar, 2021).

Academics also play a significant role in digitalizing ancient manuscripts. Digitalization becomes one of the modern methods to preserve the content of ancient manuscripts so they can be access without physically having to touch them. Academics involved in the process usually come from the fields of information technology and librarianship. They develop a secure and accessible digital system to store the digital copy of ancient manuscripts. Digitalization process requires special devices, such as high-resolution scanners and storage system that can maintain the quality of images and textbooks. Academic often work with governments, archives and libraries to provide a broader digital access, so the manuscripts can be studied by people and researchers around the world. Digitalization also allows open access for younger generation to study history and traditions without damaging the original manuscripts. Thus, academics play a role in preserving the substance and information of manuscripts to remain available in a long term, even if the physical condition of the manuscripts continue to decline (Rahman & Wibowo, 2021).

Additionally, research on the content of ancient manuscripts is one of the biggest contributions from academics. Academics in the fields of philology, history and language strive to learn the content of ancient manuscripts, analyze the language used and identify the cultural and historical context. Result of this research often becomes the source of new knowledge about social, religious, economic and political life in the past. Many ancient manuscripts contain unique perspective, rarely recorded historical events or rich local knowledge, thus academic studies on the content of ancient

manuscripts can enrich our historical and cultural literature. Academics also strive to translate and transcribe manuscripts so that it can be easily understood by general public and researchers who are not familiar with ancient languages. This process involves in-depth research, including linguistic studies and symbolic interpretation, so the result will be truly accurate and can be used as a reliable reference for further research (Setyawan, 2020).

Academics also play a role in educating the public about the importance of ancient manuscripts. They understand that preserving ancient manuscripts is not only the responsibility of the government or certain institutions, but also involves the active role of the community. Academics often hold seminars, workshops, or training sessions involving the community to raise awareness of the importance of preserving and appreciating ancient manuscripts as part of our cultural heritage. In some cases, academics also work with schools and universities to introduce the preservation of ancient manuscripts to the younger generation. With adequate education, it is hoped that the public can be more concerned and supportive of manuscript preservation efforts, both by taking care of the manuscripts owned by their families and by participating in preservation programs organized by the community (Kusnadi, 2023, pp. 44–58).

Researchers also play a role in publication and dissemination of information about ancient manuscripts. Many research results are published in a form of books, journal article or other scientific works. This publication is not only useful for academics but also provide information for the general public. With publication, people can identify and understand the content and historical context of ancient manuscripts, even those that were previously little known. These publications also serve as valuable documentation for further generation, so they can access the knowledge containing in the manuscripts even if the physical condition of the manuscripts deteriorates over time. In addition, publication also helps to increase interest and support from external parties, such as governments or international organizations, who may want to fund ancient manuscript preservation programs (Suparno, 2022).

Finally, academics often help to build networks of cooperation between institutions to support the preservation of ancient manuscripts. They work with various parties, including governments, private institutions, cultural communities, and international institutions, to create more sustainable preservation programs. This cooperation usually involves the procurement of facilities, the provision of funding, and the provision of conservation training for local personnel. Collaboration with international institutions often brings more advanced technology or conservation methods, which can help in efforts to preserve ancient manuscripts in areas that lack resources. Through strong networks of cooperation, efforts to preserve ancient manuscripts can be carried out more effectively and sustainably (Penyusun, 2023).

Overall, the role of researchers and academics in preserving ancient manuscripts is very important and covers many aspects, from cataloging, conservation, and digitization to research on content and public education. Academics not only help to maintain the physical condition of manuscripts but also ensure that the knowledge and historical value contained within them can be accessed and understood by the wider community. Through collaboration and publication, academics help to ensure that ancient manuscripts remain part of the cultural heritage that can be enjoyed and studied by future generations.

6. A Race with Time

a. Dwindling and Deteriorating

Manuscripts are ancient handwritten texts that hold cultural, historical, and religious value. They are not only a means of communication but also a medium that contains local insights and intellectual heritage that needs to be preserved (Suwardi, 2015). The increasing rarity and damage of ancient manuscripts reflect a serious challenge in preserving cultural heritage and old knowledge. Many old manuscripts, often written on fragile materials like paper and leather, suffer physical damage over time, such as tears, stains, and decay. Poor storage conditions, including high humidity and exposure to light, speed up damage, while pests like insects and fungi add to the threat. Lack of proper care, due to limited resources and knowledge of conservation techniques, leads to many manuscripts being neglected (Nasution, 2014). Therefore, it is important to preserve manuscripts in order to keep the information they contain.

Efforts to preserve manuscripts involve both maintenance and restoration, which are two different things. Maintenance is a routine activity done to keep old manuscripts in good condition, preventing damage or loss. On the other hand, restoration involves caring for and fixing old manuscripts that are already damaged, so that the information they contain remains intact (Annisa, Susantiningrum, & Ninghardjanti, 2024). There are several aspects to consider when discussing the challenges faced by manuscript conservators;

1. Biological factor due to rodents (Rats, Cockroaches, Booklice, Termites).
2. Physical factor due to the sunlight, lamp, dust, temperature and humidity.
3. Chemical factor due to chemical substances, acidity and oxidation.
4. Other factors due to human cause and natural disaster, such as earthquake, flood, blaze and other natural disaster (Nurul Rahmi & Aprida, 2023).

The challenges faced in preserving manuscripts are not just due to internal factors but also external ones. One serious issue is the lack of awareness. This is influenced by several factors, primarily the lack of education and information about the history and cultural value of manuscripts among the public. Many people do not have access to education that discusses the importance of this cultural heritage. The formal education curriculum often does not include material on local history or manuscripts, causing the younger generation to miss out on the opportunity to understand and appreciate this heritage.

Secondly, the greater focus on modern technology and digitalization can shift attention away from preserving physical manuscripts. People are more likely to consider digitally available information as more accessible and relevant, thus ignoring the value of original manuscripts. While digitalization is important, it should not overshadow the need to preserve the physical form of ancient manuscripts. Thirdly, limited resources in institutions responsible for preserving manuscripts, such as libraries and museums, also contribute to the lack of awareness. Without sufficient funding for preservation and education programs, it is difficult to promote the importance of ancient manuscripts (Azra, 2006, p. 55).

The lack of awareness has a serious impact on efforts to preserve ancient manuscripts. These valuable documents are increasingly at risk of damage and loss. When people do not appreciate the value of these manuscripts, they are less likely to try to protect and care for them. This causes many manuscripts to be in poor condition or even lost forever. The lack of awareness can lead to the loss of knowledge and information contained in these manuscripts. Ancient manuscripts often contain oral traditions,

cultural values, and religious practices that are very important for future generations to understand. Losing these manuscripts means losing access to valuable knowledge that can shape a society's cultural identity. Another impact is the hindrance of research and scientific studies. Many ancient manuscripts are important sources for researchers who want to understand history, culture, and the development of thought in society. When these manuscripts are not preserved, research related to history and culture will also be hindered, limiting our understanding of the past (Hasyim, 2017).

To address the challenge of a lack of awareness, various efforts need to be made. Education and training about the importance of ancient manuscripts should be a priority. Schools and educational institutions can integrate material about cultural heritage and manuscripts into their curriculum. Educational programs such as seminars, workshops and exhibitions can help increase public understanding of the value of ancient manuscripts. Social media and digital platforms can be used for awareness campaigns. People today are more active on social media, so using these platforms to spread information about ancient manuscripts can be an effective way. Interesting campaigns can attract the attention of young people and encourage them to appreciate cultural heritage more. Cooperation between the government, educational institutions and civil society organizations is very important. By garnering support from various parties, manuscript preservation programs can be implemented more effectively. Financial support and resources can help institutions to carry out conservation and education about ancient manuscripts (Nasution, 2014).

Technology can play a crucial role in raising awareness of the importance of ancient manuscripts. Digitizing manuscripts not only makes them more accessible but can also be an effective educational tool. By providing digital access to ancient texts, people can more easily learn about and understand the content and context of these manuscripts. Additionally, technology can be used to create interactive platforms that allow people to learn more about ancient manuscripts. For example, apps that allow users to view manuscripts in detail and learn about their history and context can attract the interest of younger generations. Therefore, the first step that should be taken is to digitize manuscripts, especially in the Tuban area, to create a natural awareness of the importance of preserving ancient manuscripts for the community. Another important urgency of digitalization is to make manuscripts a reference source for historical research, considering that manuscripts are difficult to access by historians.

b. Digitalization Process

Digitalization is an effort of preserving written texts in a manuscript by altering it into digital form through photography process (Fathurahman & Putten, 2020, p. 3). Manuscript digitalization is also known as the process of altering physical to digital manuscript, so they can be accessed, stored and protected. In digitalization, there are several steps that needs to be done. The process is divided into three stages, namely: Pre-Digitalization, Manuscript Digitalization and Post-Digitalization.

In the pre-digitalization stage of a manuscript, the first important preparation is to ensure the completeness of digitalization equipment, such as cameras, tripods, tables, and other equipment. Then, the selection of a room to be used as the location for the digitalization process is also very important to consider. The digitization practice should be carried out in a room that is not too far from the original storage location of the manuscript. In fact, if there are many manuscripts, it is highly recommended that the digitization process be carried out where the manuscripts are located. Even if the digitization process must be carried out outside the room, when moving the manuscripts,

permission must be obtained from the owner and in accordance with the manuscript moving procedure (Fathurahman & Putten, 2020, p. 13).

After that, philologists on digitalization practice will conduct manuscripts sorting, meaning that not all manuscript can be digitalized. Philologists. A philologist must evaluate the suitability of a manuscript based on its content and physical condition. Several things must be considered during the manuscript selection process, including:

1. Choosing local values;
2. Choosing a significant academic impact;
3. Choosing uniqueness over similarity;
4. Other reasonable considerations.

The next step after sorting the manuscripts is cleaning. The cleaning process is carried out procedurally with great attention to important aspects, such as using special gloves, using special brushes, wiping with citronella oil (if the manuscript is made of lontar palm leaf) (Fathurahman & Putten, 2020, p. 19) and so on.

The second stage is the manuscript digitization process. In this case, DREAMSEA employs the One Shoot/One Page digitization technique. This method involves the photographer capturing a single image of each page with just one shot. Therefore, the number of resulting images directly corresponds to the number of manuscript pages. This principle applies to manuscripts in book format and made of paper. If the manuscript size is too small for the camera lens, the One Shoot/Two Pages technique is used. A consequence of this principle is that the recto-verso folder system is not applicable. However, neither of these principles is applied to non-book manuscripts. There are several important points that photographers must consider during the manuscript digitization process (Fathurahman & Putten, 2020, p. 39):

1. Before taking photos of the entire [manuscript/object], take a sample photo to check the color balance (calibration).
2. Check the framing of the image.
3. Hasil gambar harus proporsional, tidak cekung/ cembung.
4. Jarak QP Card kurang lebih 1 cm dengan manuskrip.
5. Periksa hasil gambar pada tingkat zoom 100%.
6. Periksa fokusnya.
7. Pada "View", pilih "grid lines" untuk memastikan posisi gambar lurus dan siku.
8. Cek kualitas gambar setiap 20 kali pemotretan.

After the digitization process is complete, the next step is image processing. Once the manuscript has been photographed, the photographer must review the digitalized results to minimize wasted time and costs if the review is done after the entire digitization mission is completed. Once the digitalized results are deemed satisfactory, the next step for the photographer is to number the folders and files. The final step for the photographer (philologist) is to add metadata and descriptions. Metadata is information that describes the manuscript, such as the title, author, date of creation, and historical context. Adding complete and accurate metadata is very important for improving accessibility and searchability. This information allows users to find and understand the manuscript better (Rogers, 2016).

Information from the past is recorded in ancient manuscripts that can be found in various regions in different forms, such as lontar, deluang, or animal skin. The discovery of these objects is evidence of the existence of recording techniques in the past that were applied to different materials. Ancient manuscripts or manuscripts have high value for historians. The discovery of manuscripts that discuss past conditions can strengthen the

formation of a nation's identity. Manuscripts have valuable information that is needed by historians and disseminated to the public to learn about the cultural conditions of past societies (Prastiani & Subekti, 2019).

Manuscripts today are static archives that hold historical and artistic value. They are also records of the past, containing accounts of events that have occurred. The value and importance of manuscripts present a new challenge: to preserve and protect them for future generations. Ancient manuscripts or manuscripts are receiving increasing attention due to their age and vulnerability to deterioration. As mentioned above, efforts have been made to preserve these manuscripts. When digitizing ancient manuscripts, careful planning is necessary to ensure their long-term preservation (Khadjah, Perdana, Kirana Sarasvathi, & Winoto, 2021).

The implementation of manuscript digitization should consider various aspects that researchers take into account. It should be carried out by trained staff to operate the digitization equipment. Procedures for carrying out digitization should be used as a reference to ensure that the digitization process runs smoothly and well (Prastiani & Subekti, 2019). The manuscript digitization process is carried out in an effort to preserve the condition of fragile manuscripts with the aim of saving the information of the past contained within them. The city of Tuban has become a target for ancient manuscript digitization because many old and fragile manuscripts have been found there.

Digitizing these manuscripts is very beneficial for preserving them for future generations. This process makes it easier for researchers to access ancient manuscripts. By converting these manuscripts into digital format, they can be accessed anytime, anywhere, reducing the risk of damage caused by frequent physical handling. The primary goal of digitizing these manuscripts is to physically preserve them while making them available to researchers and the public. By preserving these ancient manuscripts, we can safeguard an invaluable cultural heritage for our region. Another benefit is the ease with which people can read and study these ancient manuscripts without worrying about causing damage to the original (Khadjah et al., 2021).

After being digitized, these ancient manuscripts will be uploaded and published online. These digital manuscripts will have interactive features to enhance the learning experience and make it easier for users to use them as research references. Their rarity makes them a valuable resource for historians, serving as primary sources and enriching our understanding of unique local history (Prastiani & Subekti, 2019).

IV. CONCLUSIONS AND SUGGESTIONS

CONCLUSION

This research concludes that ancient manuscripts digitalization is a crucial step in preserving cultural heritage. The digitalization process not only protects manuscripts from physical damage but also makes them more accessible to academics and general public where the information is easily and quickly accessed, expanding the scope of research and academic studies.

Tuban, with a land of 1.839.94 Km² and a sea area of 22.608 km², is a historic regency with rich collection of ancient manuscripts. These manuscripts are usually found in the Tuban area. The physical condition of these manuscripts is a major concern, making preservation and maintenance necessary. Considering factors such as material, size and binding condition, researchers can classify these ancient manuscripts. This classification helps in comparing one manuscript to another, allowing researchers to identify differences and similarities and understand the evolution of writing styles and content over time.

This research shows that conservation and digitalization of ancient manuscripts is necessary in this era of technology. With advanced technology, ancient manuscripts that were previously difficult to access due to its physical condition or inaccessible storage locations can now be studied and preserved for future generation. This effort not only preserve our cultural heritage but also contributes to the advancement of knowledge and history comprehension.

SUGGESTIONS

We acknowledge that there are many shortcomings in this research. Therefore, we welcome all constructive criticism and suggestions as an evaluation for our future work. We hope that this report can provide benefits and positive impacts to the readers. We also hope that similar research will be conducted in the future to obtain more comprehensive results. Thus, people today can learn more about the lives of their ancestors and gain a better understanding of past cultures.

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