

From Italy to the UAE: A Multidisciplinary Approach to Studying Islamic and Arabic Manuscripts on European Papers

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Abstract – The research enhancing the use of digital technology, imaging techniques in studying, documenting, archiving, digitizing, and preserving manuscripts collection. The evaluation and improvement for the study of manuscripts by integrating both classical methods of codicological research and advanced digital technologies, introducing new approaches to collection preservation and examination.

The manuscripts contained significant watermarks giving more information about different European papermills especially Italian papermills and addressing the challenge of writing Islamic texts on European paper containing watermarks in the shape of Christian symbols; this was important because cultural heritage often serves as a bridge for dialogue. The research explores the changes in manuscript paper design and the role of Arabic and Islamic culture in the changes in the manufacture of European papers. The study approach on RAK manuscript texts and papers encompasses not only the physical attributes of the manuscripts but also their socio-cultural significance. The results offer examination of paper characterization, manufacturing techniques, and previous interventions. This evidence deduces what might be considered the most significant characteristics of Italian papers. The developed non-destructive characterization methodology applied to Islamic and Arabic manuscripts expands the database with the material properties of papers of known age and provenance and thus better understands geographic and temporal distributions of papermaking practices in Italy. the importance of manuscripts as significant sources for rediscovering and analyzing the Muslim written cultural heritage.

I. INTRODUCTION

Conservation and preservation are an innovative, fast-developing field based on research. Conservation needs to be reflective practitioners; and keep up to date with recent

developments and new ways of thinking. To facilitate the entire museum's needs including curatorial requests for authentication or for detailed materials analysis. In these three cases we try to find what we need to know about the collection, what information do we need to provide about collection to find significance of objects and providing community engagement and education. How we can expand our understanding of the history, of both its physical and social attributes with providing a sustainable preservation Practices.

Preservation of collection can make our museum unique; collection is an important recourse of valuable information they provide and interactions among people and environment collection gives visitors better understanding of cultural heritage of the region, through Their potential value, as reference materials, or as objects aesthetic or educational importance.

The aim of our research is to present a new way of thinking about conservation of museum collection, thinking more about the collection biography. Despite the objects is the main concern of museum conservators but sometimes the related materials to objects can add more significant value to objects. The research presents a study of object's life through the materials used within, Analyze the social lives of objects (Object 'biographies'), to understand what stage in an object's life we are studying, recording, representing and conserving.

Research Objective

The aim of the study was researching the origins and history of artifacts to understand their significance, including how and when they were created, used, and acquired. Cultural Context and Investigating the cultural and societal contexts in which artifacts were produced and used, including their roles in daily life, ceremony, and trade.

The research presented in detail the practices and methodology applied at the national museum of Ras Al Khaimah applying advanced conservation techniques, and integrating technological innovations, to ensure that the

collections are preserved, well-documented, and effectively used to educate and inspire future generations.

The research moves from traditional histories of collections that tend to concentrate on individual collections to undertake the first analysis of the Museum collection by looking across time, place, and material. The museum's collections reflect peoples' civilizations, enhance patriotism, and play a vital role in serving culture and heritage. In addition, they monitor and document the history of nations and traditions of peoples through their archaeological and cultural collection evidence. They also provide an image of the cultural momentum and indicate how far the society is aware of the importance of historical documentation. From this perspective, museum visitors could be acknowledged with the cultures and civilizations of nations through their antiquity collections.

BOOKS AND MANUSCRIPTS

The book and manuscript research included several necessary measures to preserve and restore these valuable treasures. The project assessed the condition of the manuscripts and books, documenting their physical condition, historical significance and any existing damage. Digitisation enhances accessibility and preserves content before conservation treatment is applied. High-resolution images were captured to create a digital copy of each piece, ready to be made available online. Text-to-speech, an audio version of the text, made the content accessible to people with visual impairments or reading difficulties, ensuring everyone can access and benefit from our written culture. Additionally, transcribing manuscripts in a standardised format improves legibility.

The collection consists of 63 manuscripts, books and notebooks from daily life. It includes copies of the Holy Qur'an, Islamic books, manuscripts in jurisprudence and Sunnah books, copies of manuscripts of famous imams and Muslim scholars, and the well-known Arabic language Oceanic Dictionary, which contains handwritten poetry verses recorded and written by Sheikh Sultan bin Salem, the ruler of Ras Al Khaimah from 1921 to 1948. It is a diary of the Emirati people's daily life and sailors' trips. The conservation process applied to the 63 objects began with fumigation and isolation to ensure there were no active infections or live insects. Restoration proceeded with careful cleaning to remove dirt, dust, insect residues and other contaminants; removing previous treatments; lining many manuscripts and book pages; re-binding some books; re-binding some covers; and making good missing parts and insect damage. Restoration methods aimed to preserve as much of the original material as possible and ensure no further deterioration occurred.

Important watermarks have been recorded to give more information about the different European paper mills and

to study the changes in manuscript design and the role of Arab and Islamic culture in the paper industry. The approach to studying the texts and papers of the Ras Al Khaimah manuscripts includes not only the physical features of the manuscripts but also their social and cultural significance for the Emirati people.



Fig. 1 Examples from the manuscript and book collection.

The Arabic and Islamic manuscript and book collections at Ras Al Khaimah National Museum are significant for the direct window they provide into the past, offering a detailed account of the daily life of the Emirati people, social structures, cultural practices and the evolution of Arabic languages and ideas. These collections are repositories of knowledge, preserving literary, religious and everyday texts that have shaped human understanding and progress.



Fig. 2. A page from one of the studied manuscripts.

RESEARCH METHODOLOGY AND INNOVATION

The digitisation strategy started with determining which manuscripts and books were a priority based on their historical significance and manufacture. Digitisation started with manuscripts, according to the central objectives of increasing accessibility, enhancing research opportunities and preserving these sensitive and unique materials.

High-resolution images were captured of each page, and settings were adjusted to achieve the best balance between

image quality and file size. The digitised manuscripts and books were provided with descriptive metadata for each item, including title, author, watermark, codicology (measurements, binding, contents, publication date and period, provenance, etc.) and any relevant historical context, as well as information about the collection that might benefit researchers.

A procedure for data, images and information validation was applied to check the scanned images for accuracy and ensure that metadata is correctly associated with each item. Detailed descriptions, historical context and relevant keywords have enhanced the discoverability of digitised items. The digitised materials are stored on secure and stable systems. A backup strategy has been put in place to prevent data loss, and assessment of the formats and storage methods used is ongoing, migrating content as needed to avoid obsolescence.

There is a significant gap in our knowledge of Islamic papermaking.

Besides digitising, archiving and documenting the manuscripts, the research also aims to survey the evidence for techniques and materials typically used in Islamic papermaking or paper with Islamic texts to identify the most significant characteristics.

Watermarks

Watermarks are designs or patterns incorporated into paper during its production and can be seen when the paper is held up to the light. They are often used to identify the manufacturer, type of paper and the paper provenance or paper mills.

Watermarks, as we understand them, emerged comparatively late in history, around the 13th century in Europe. They were initially used in the paper-making process as a way for manufacturers to identify their products and distinguish them from competitors. Watermarks were created by attaching a design or pattern to the wire mesh used in the paper-making process.

As the paper pulp settled and dried, it would be thinner in the areas with the design, creating a visible pattern when the paper was held up to the light.

Watermarks became particularly important studying old master prints, as they helped identify the authenticity and provenance of artworks on paper.

Bibliographers and historians have also used them to study the production and distribution of paper during different periods.

In the context of manuscripts, the study of watermarks is significant for dating and identifying the source of paper used in later manuscript copies. Still, this practice is more relevant to manuscripts created after the introduction of paper and the use of watermarks rather than ancient manuscripts themselves.

Backlighting was used (light behind the document), tracing the watermark designs with the help of a light sheet

to begin gathering a collection of images to form the basis of our research. We noticed a series of interesting examples of early watermark design and undertook further research, hoping to learn more about the date and provenance of the papers, trade and production patterns involved in the paper industry of the time, and the practice of watermarking paper. There is a wealth of valuable and interesting information to be gained from studying watermarks

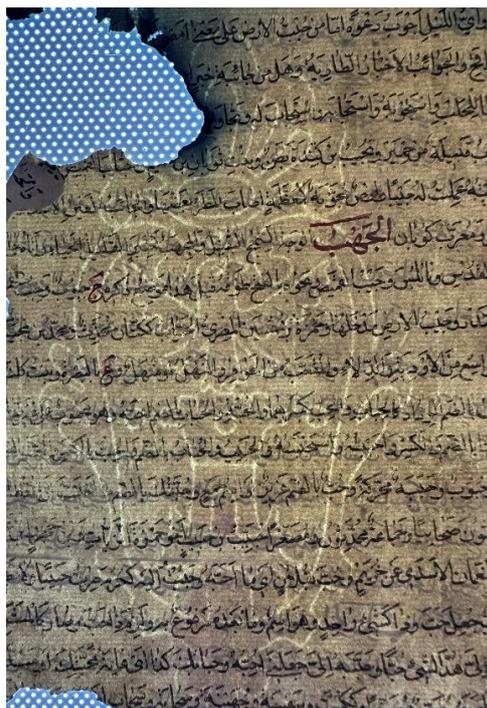


Fig. 3. The crowned bird shield and tower in *Kitāb al-Qāmūs*

More than twenty watermarks were documented and identified in the National Museum of Ras Al Khaimah collection. Based on paper examination and quantitative data, the research supports the idea that paper should be treated as a source and provides tools to determine the production of manuscripts in a defined space and time. This methodology offers new insights into the competition between suppliers and the various markets, particularly concerning the emergence of import-export trading companies.

The paper used in the manuscripts was handmade in various European paper mills. These were identified through a detailed study of the watermarks found on these manuscripts. The identified paper mills include Andrea Galvani, Valentino Galvani-Van Gelder, Giorgio Magnani, Picardo, Smith & Menier and Benedetto Gentile (or Giovanni Berti). Watermarks vary between three crescent moons, the face of the moon inside a shield, a crown-star-crescent, a crown-crescent with two crescents on the side points, three hats with a flower between them,

two P's and a flower between them. Our manuscript collection is one of the most important found in a museum.



Fig. 3. Threecrescent, the moon face in a double-bordered shield, and Crown-star-crescent watermark motif.

A digital facsimile of the watermarks from the pages of the manuscripts was created as a part of the documentation. The visible forms of watermarks are classified chronologically; in 19th-century manuscripts, the visible watermarks are the ‘three crescent moons’ and

‘half-faced moons’.

The ‘crown-star-crescent’ watermark was also found. This watermark was made for the Muslim markets and was widely used in the Chancellery of the Ottoman Empire in the 16th to 18th centuries CE. The most common watermarks in RAK National Museum manuscripts were the ‘three crescent moons’ and ‘half-faced moons’.

For most of the collection’s manuscripts, there is no written information related to the title, author and year of writing. In this case, watermarks can be used to estimate at least the date of composition.

As a part of this research on watermarks in manuscripts, we could note that each paper company produced unique and distinct types and forms of watermarks. Among the watermarks in European papers was the ‘three crescents’, which was well-known then. This watermark was created by an Italian paper company. Italian paper was also traded in the West African region via routes from the Middle East, particularly through Egypt. In the late 18th and 19th centuries, Italian paper was widely used in Egypt, and from there, it was re-exported to other countries in Africa and Arabia. Crown double-contoured circllet and mutually curved prongs watermarks date to 1697-1703, as mentioned before. The possibility should be raised that paper imports from Italy replaced the Islamic paper trade to the Southeast Asian region. Italian paper arrived in Southeast Asia via ‘Islamic’ routes, but paper from the Middle East itself was rarely used in Southeast Asia.

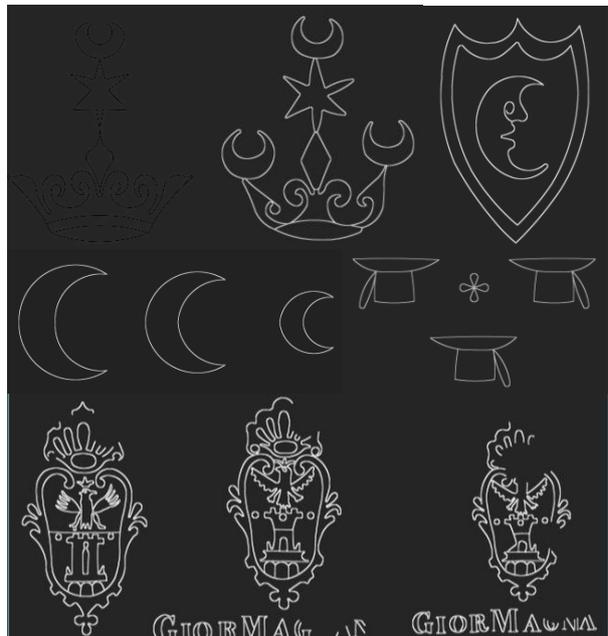


Fig. 3. Digital drawing the moon face in a double-bordered shield, Crown-star-crescent, three hats, Threecrescent and The crowned bird shield and tower; watermark motif.

DISCUSSION

Preservation and conservation involve not only practices to mitigate risks and maintain the integrity of collections but also to disseminate knowledge and facilitate the exchange of ideas, fostering collaborations within the scientific community. To that end, it is crucial to make research findings accessible to serve as an archival record of scientific progress and research developments over time, providing a reference point for future researchers. This discussion explores the importance of preserving and extracting data about heritage collections with limited resources. In the case studies presented, the two daggers allow us to demonstrate the importance of study and documentation in identifying the significant value of collections.

Preserving Ras Al Khaimah's National Museum collection presents a significant challenge. Working in direct contact with the objects and studying the debates and practices of the past while reviewing our own practices revealed that present-day conservation choices integrate decisions for the collection's future sustainability. It was discovered that limited devices and materials, combined with the condition or state of an object and past trends in scientific approach, affect an object's characteristics, even becoming part of it.

Our present-day conservation of the collection is not just about remedial intervention. It is about the application of scientific methodologies and laboratory applications, each with its unique approach. The challenge of discovering new information about the collection and the meticulous sorting of its data can significantly enhance its value. data can significantly enhance its value.

CONCLUSION

An integrated approach is paramount for the safeguarding and continued study of this invaluable cultural repository. The collection, rich in artefacts and historical significance, represents a pivotal aspect of the UAE's heritage and identity.

The National Museum of Ras Al Khaimah's collection offers a profound insight into the region's past, encompassing ancient artefacts, historical documents and cultural artefacts that illustrate the evolution of the emirate and its people. This historical context is crucial for fostering a sense of cultural continuity and pride among local and international audiences.

The preservation of the diverse and extensive collection involves numerous challenges, including environmental factors, material degradation and the need for ongoing maintenance. Addressing these challenges requires a multifaceted strategy incorporating modern conservation techniques, climate control and regular monitoring.

An effective preservation strategy must integrate historical research with conservation practices. This means

employing interdisciplinary methods that involve historians, archaeologists, conservationists and museum professionals. Collaborative efforts ensure that conservation practices are informed by historical context and that the collection's significance is preserved while maintaining its physical integrity.

Digital technologies play a significant role in the collection's study and preservation. Digitising artefacts and historical documents ensures they are accessible for research and public engagement while providing a valuable backup in case of physical damage.

Developing and implementing a comprehensive preservation plan that addresses current and future needs is crucial. This plan should be dynamic, allowing adjustments based on new research, technological advancements and evolving conservation techniques.

In conclusion, the National Museum of Ras Al Khaimah collection is a testament to the rich cultural heritage of the UAE. An integrated approach to its study and preservation ensures the collection's longevity and enhances its value as a resource for future generations. Combining historical scholarship with advanced conservation practices and community engagement can safeguard this irreplaceable collection for continued enjoyment and learning.

FUTURE RESEARCH

To ensure the continued relevance and preservation of the National Museum of Ras Al Khaimah's collection, our future research suggests focusing on materials analysis to research new materials and methods for conservation that can help preserve artefacts. This includes studying different materials' degradation processes, developing more effective treatments, and investigating advanced climate control technologies that can better manage temperature, humidity and light exposure in the museum environment.

Contextual research and applying further research into the historical, cultural, and social contexts of the artefacts can enhance understanding and interpretation. This includes interdisciplinary studies that integrate archaeology, history, and ethnography.

We plan to periodically reevaluate the artefacts in the collection, as new discoveries or technologies can provide fresh insights into their origins and significance.

We aim at the continued development of digital catalogues and databases to improve the accessibility and management of the collection. This includes creating high-resolution digital records and 3D models of artefacts.

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