"Preserving Nigeria's Cinematic Heritage: Logical Processes to the Digital Restoration of Adamu Halilu's *Shaihu Umar*"

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Abstract

This study investigates the logical processes involved in the digital restoration of Adamu Halilu's iconic film, Shaihu Umar. It explores how decisions made during the digital restoration process impact the outcome and its alignment with the preservation goals of the project. The primary aim is to assess the strategic role and impact of these processes in achieving high-quality audiovisual content while ensuring the film's longevity and cultural relevance.

Digital restoration plays a crucial role in mitigating damage from repeated projections, extending the lifespan of cinematic catalogs, and expanding access to historically significant films. For Shaihu Umar, the study examines the interplay between analogue film restoration principles and digital restoration techniques, guided by Archival Theory and Restoration Ethics. It specifically evaluates whether standard practices in digital film restoration were effective in preserving the film's original picture quality, color fidelity, and sound clarity.

Using a mixed-method research approach, the study relied on secondary data collection, with insights from focused group discussions to achieve its objectives. Findings indicate a strong correlation between effective analogue restoration techniques and the success of digital restoration processes. The restoration of Shaihu Umar adhered to established ethical principles, ensuring the retention of its original aesthetic and technical qualities.

The study concludes that the film restoration project of Shaihu Umar, requires unique and well-defined goals to ensure the achievement of project objectives. Recommendations emphasize

the need for standard storage facility to safeguard cultural heritage and advocate for comprehensive training programs on digitisation and restoration techniques.

Keywords: *Film Decay, Digital restoration, Nigerian films, cultural heritage, Shaihu Umar, audiovisual preservation, film archiving.*

Introduction

Nigerian cinema, popularly referred to as "Nollywood," has its roots in the mid-20th century, evolving from colonial film practices into one of the largest and most dynamic film industries in the world. According to Adesanya, the foundation of Nigerian cinema was laid with the production of films by filmmakers like Ola Balogun and Hubert Ogunde in the 1970s, who used cinema to narrate indigenous stories and address cultural and political issues (14).

One of the earliest and most significant productions is Adamu Halilu's *Shaihu Umar* (1976), an adaptation of Alhaji Abubakar Tafawa Balewa's novel. The film stands as a testament to the intersection of literature, history, and cinema in portraying Nigeria's cultural heritage and social realities. Other notable works from this era include *Ajani Ogun* and *Kongi's Harvest*, which reflected traditional and contemporary narratives while engaging with postcolonial discourses.

The advent of affordable digital technology in the 1990s transformed Nigerian cinema into what is now known as Nollywood. This shift democratized filmmaking, enabling creators to produce films quickly and cost-effectively. According to Haynes, Nollywood ranks as the second-largest film industry globally by volume, producing thousands of films annually that reach audiences across Africa and the diaspora (5).

Preserving Nigeria's cinematic heritage, especially films like *Shaihu Umar*, is essential for safeguarding the nation's cultural identity. Digital restoration efforts not only prevent the loss of historically significant works but also enhance their accessibility for education, research, and entertainment. These efforts reaffirm the role of Nigerian cinema as a vital medium for storytelling and cultural preservation in a rapidly globalizing world.

The preservation of cultural heritage through cinema has long been a challenge, particularly in regions with limited archival infrastructure. For decades, the *Shaihu Umar* was presumed lost until 2016, when fragments of its reels were rediscovered at the Nigerian Film Corporation (NFC) in Lagos and later completed with elements found at the National Film, Video and Sound Archive (NFVSA), Jos.

The rediscovery of *Shaihu Umar* marked a pivotal moment for Nigeria's audiovisual heritage, spurring collaborative efforts between the NFC and international institutions, such as the Arsenal Institute for Film and Video Art, Berlin. This collaboration not only enabled the digital restoration of the film but also laid the groundwork for specialized academic programs, including the master's degree in Film Culture and Archival Studies at the University of Jos and National Film Institute, Jos.

Digital restoration, now a critical tool in archival practices, played a transformative role in salvaging *Shaihu Umar*. By employing cutting-edge techniques such as digitization, image stabilization, and color correction, the restoration process addressed the challenges posed by physical degradation, including scratches, mold, and chemical deterioration.

This article delves into the logical processes involved in the digital restoration of *Shaihu Umar*, exploring the technical and ethical considerations, the significance of its cultural narrative, and its implications for the future of film preservation in Nigeria underscoring the importance of

preserving cinematic heritage as a means of safeguarding history and identity for future generations.

Decayed Film and Restoration Process

Film decay is a natural process where film materials deteriorate over time due to chemical, environmental, and handling factors. This decay poses a significant threat to preserving cinematic heritage, particularly in regions like Nigeria, where archival resources and restoration facilities may be limited. Film restoration is the process of reversing or mitigating this decay to preserve historical and cultural artifacts for future generations.

Authorities, scholars, and researchers in the field of audiovisual archiving, including Hediger Vinzenz, Giovanna Fossati, Jörg Houpert, and Egbert Koppe, have emphasized the urgent need to rescue decaying films (Plate 1) stored on the shelves of archive vaults worldwide. Their collective work underscores the importance of preserving these films as invaluable cultural artifacts that safeguard histories, narratives, and artistic achievements within the global space. This call to action reflects a shared commitment to ensuring that the fragile medium of film remains accessible to future generations, serving as a vital link to our shared heritage.

Plate 1: Decayed acetate film showing high level of deterioration
Source: NFVSA, Jos.

Greco added that most nitrate-based films were not preserved and with time, their original camera negatives and prints disintegrated into dust or powder. Many of them were burned in studio or vault fires or recycled for their silver content. According to Henrique and José (11), Film preservation has been practiced since the 1930s, until 1980 when UNESCO acknowledged "moving images" as a significant component of the global cultural heritage. The restoration of audiovisual materials is completely new in terms of techniques. A ‘charter on film restoration’ endorsed by FIAF in 2011 asserted that restoration differs in other fields, where a tradition is

already established. This typically imply work on an original artefact and the film restoration implies duplication and/or reconstruction.

Edmondson states that critical observation revealed that the issue of restoration is not as simple its sounds, the process usually involves work on an original artefact and duplication. But what is certainly true is that the restoration of moving images and sound recordings is distinguished from most other cultural restoration practices apart from print media (e.g. the publication of facsimile editions of historically significant manuscripts or editions), in that access to the result does not involve direct contact with the original artefact: the output is always a duplicate or surrogate (10). However, the ability to make duplicates from a single film element is a fundamental technological principle that is essential to the survival of cinema as a cultural and economic viability. A significant proportion of the work in film restoration involves recreating the original phases.

Hart states that due to the fragility of film stock, proper preservation of film usually involves storing the original camera negatives (if they have survived) and prints in climate-controlled facilities (Plate 2). Most films were not stored in this manner, which resulted in the widespread decay of film stocks. The problem of film decay is not limited to films made on cellulose nitrate, but film industry researchers and specialists have found that colour films are also deteriorating at an increasingly rapid rate (20).

Digital Film Preservation and Approaches

The recognition of digitisation as a preservation strategy for films and audiovisual materials is gaining more momentum globally. However, it is a relatively new concept within the cultural heritage community, which has generally viewed digitisation activities as a form of copying for easier and broader access. Epistemologically, "preservation is an umbrella term under which most librarians and archivists cluster all the policies and options for action, including conservation treatments of different formats of information materials" (Kalusopa and Zulu, 29).

The needs and requirements for digital preservation have been incorporated into the overall program planning and the purpose of preservation is to ensure the protection of information of enduring value for access by present and future generations. In the views of Routhier "digitisation has become one of the standard forms of preservation for libraries, archives and information centers. This process (digitisation) is allowing preservationists to ensure information contained within fragile, organic materials will still be viewable to future generations" (4).

Plate 2: Controlled Acetate Film Vault
Source: NFVSA, Jos.

Digital preservation strategies are methods for keeping stored digital objects permanently accessible for long-term re-use. Arora Jagdish observed that, implementing a digital preservation strategy is a crucial part of managing the risk associated with rapid hardware and software obsolescence and strategy is a general framework that provides guidance for actions to be taken and, which at the same time, is shaped by the actions being taken (23).

ANALOGUE TO DIGITAL RESTORATION

According to Byrne et al., the toolset available to film restorers was generally limited to what could be achieved through photochemical means prior to the development of digital technology (27). Film materials could be physically cleaned to remove dirt, and the appearance of scratches could be reduced using wet-gate duplication. Colour could also be adjusted through grading (timing), and the Desmet Method could be used to approximate the tints and tones of silent- era films. If new elements, such as titles, had to be recreated, they were photographed, printed, and physically inserted into the new negative or print. For all practical purposes it was not possible to manipulate the pictorial elements within individual frames. The usual culmination of photochemical film restoration project was a new film negative and new film positive created from that negative.

Many limitations of photochemical restoration vanished with the advent of digital imaging and digital manipulation technology. Not only can film materials now be digitally duplicated and edited, but it is also a simple matter to manipulate the image content within individual frames. Modern digital restoration tools are incredibly powerful, they allow archivists to bring films back to life, removing decades of damage and decay. Yet, these same tools also pose a serious risk, if used carelessly or with a commercial rather than historical focus, they can strip away the original character and authenticity of a film, altering how it is remembered and interpreted by future generations. While archives are the caretakers of the past, they also shape the future. As our analogue materials migrate into the digital realm, it becomes increasingly likely that these digital versions are the only ones that the future to generations will know. It is our responsibility to not only preserve the "content" of a film but also to preserve its nature. Every decision taken during the analogue-to-digital transformation, whether it is documented or not, will endure as perhaps the only accessible version of the film. Non-specialized audiences cannot be expected to understand the difference between categorizations such as "restoration" and "derivative work".

According to the FIAF restoration ethics, every film restoration project is unique. The type, quality, and era of the original materials (analog films) vary, as do the goals that the projects hope to achieve. In some instances, it may be reasonable to employ a certain digital tool or technique where the same technique in a different situation could be completely inappropriate (6 - 12). These rules, ethical guidelines and red lines were strictly adhered to during the digital restoration of *Shaihu Umar*.

Presentation of *Shaihu Umar*

The film *Shaihu Umar* was produced in 1976 by the Federal Ministry of Information, Nigeria, and directed by Adamu Halilu. It was digitized in 2019. The story follows Umar, a Hausa scholar, who narrates his life in response to a student's question, recounting a fictionalized biography full of trials and triumphs.

Born in Kagara, Umar loses his father as an infant and moves in with his grandmother. After her passing, he lives with his mother and her second husband, Makau, a loyal aide to the Kagara Chief.

A conspiracy leads to Makau's exile to Zaria, where he endures numerous adventures before settling in Makarfi. Umar's mother attempts to reunite with Makau but decides to visit her ancestral home first, leaving four-year-old Umar in the care of her friend, Amina. Tragically, Umar is kidnapped by a sorcerer but escapes after the sorcerer is killed by a hyena. Rescued by a farmer and his wife, Umar finds temporary safety until slave raiders attack, and he is taken by Gumuzu, a raider from Kano.

Umar's fortunes shift when Abdulkarim, an Arab businessman in Kano, adopts him after recognizing his intelligence and kindness. Under Abdulkarim's care, Umar studies the Quran and becomes a scholar. Meanwhile, his mother's efforts to find him lead to her own capture and eventual sale into slavery in Tripoli. She becomes a servant of a wealthy trader, Ahmad, after being deceived by intermediaries.

Umar ultimately survives a sandstorm on his way back to his homeland. As a traveling scholar, he settles in Rauta, teaching Arabic and earning a reputation as a respected Islamic scholar. His journey from hardship to prominence underscore's themes of resilience, faith, and destiny.

Digitisation Processes

The research adopted a triangulation, or mixed methods approach, combining both quantitative and qualitative methodologies. This approach was particularly effective as it facilitated the exploration and gathering of comprehensive information, encompassing both descriptive insights and numerical data.

A fundamental aspect of the research centered on the project workflow, which is critical to successful film digitisation and restoration efforts (figure 1). As emphasized by Byrne et al., effective workflow planning for a digital project begins with clearly defining its goals and purpose. Key considerations include whether the project aims to create a digital reproduction of a single film element (*Digital Reproduction*), reconstruct and restore a film that exists only in multiple fragmentary sources (*Digital Reconstruction and Restoration*), or address objectives that fall between these extremes. The strategic planning framework highlights the importance of deliberate and goal-oriented workflows in preserving and restoring film heritage.

Project planning was the essential first step before proceeding with a film restoration project and includes the decision of what form, or forms, the final restoration will take once the project is completed. At a minimum, the raw scans of all materials used in the restoration would be preserved in this case DNG files. The restoration was also based on original prints and negatives and then understanding the context, technology, and aesthetics of the original production was essential in achieving an accurate and ethical result. All available elements of *Shaihu Umar* were selected in both 16mm and 35mm.

The first step of the scanning of the films was digital conversion (scanning) of the analogue image media. Since the goal of scanning was to produce the closest possible digital approximation of the photochemical film element, the film elements were scanned at the highest resolution available using 2k film scanner by Edeltraud Kornmanufaktur.

Digital image-restoration techniques were engaged to remove damaged that had occurred to the various film material selected for restoration using digital software tools. The areas that were ethically addressed were characterized as damaged to a print, such as dirt and scratches, that occurred during their distribution, and damage (or subsequent repair) that was imposed during the preservation of the material. What will not be “corrected” or addressed were characteristics that were genuine to the original, such as properties of the original photography (e.g., camera instability or wobble), original negative and print assembly (splice lines), even original production mistakes such as gate hairs in the camera recorded on the negative, as well as other original characteristics of the technology or production processes, such as film grain and film processing/developing marks.

For this project, the most important element of accurate colour grading was to work with reference materials that was provided with objective bases for comparison. The ideal references were exhibition prints dating from the time of the film’s original release, though it was important to understand that no single print from the time of the film's exploitation is necessarily definitive.

The original frame rate of 24 frame rate per second (fps) was maintained expect when the scanned film will be rendered in formats with higher frame rates such as Digital Cinema Package (DCP).

Digital projection or dissemination respected the original aspect ratio, and the original frame rates. The various digital formats that were considered for preservation, projection and exhibition of this project included DNG, TIFF, MP4, MOV, AVI, DPX, EXR, DCP, JPEG2000 and so on depending on the available technology for projection and exhibition.

THE RESTORATION PROCESSES

During the restoration processes of *Shaihu Umar*, the restorer decided that this film should be digitised based on the historical values, cultural and educational importance and due to high level of deterioration of the film elements which had resulted to permanent loss of some scenes (valuable contents). Film base decomposition was judged which necessitated restoration activity and had resulted in the total or partial loss of the original, or closest surviving generation to original element of this film title. The restorer of *Shaihu Umar* used a decomposed best surviving element but in physically better shape as the basis for a restoration master.

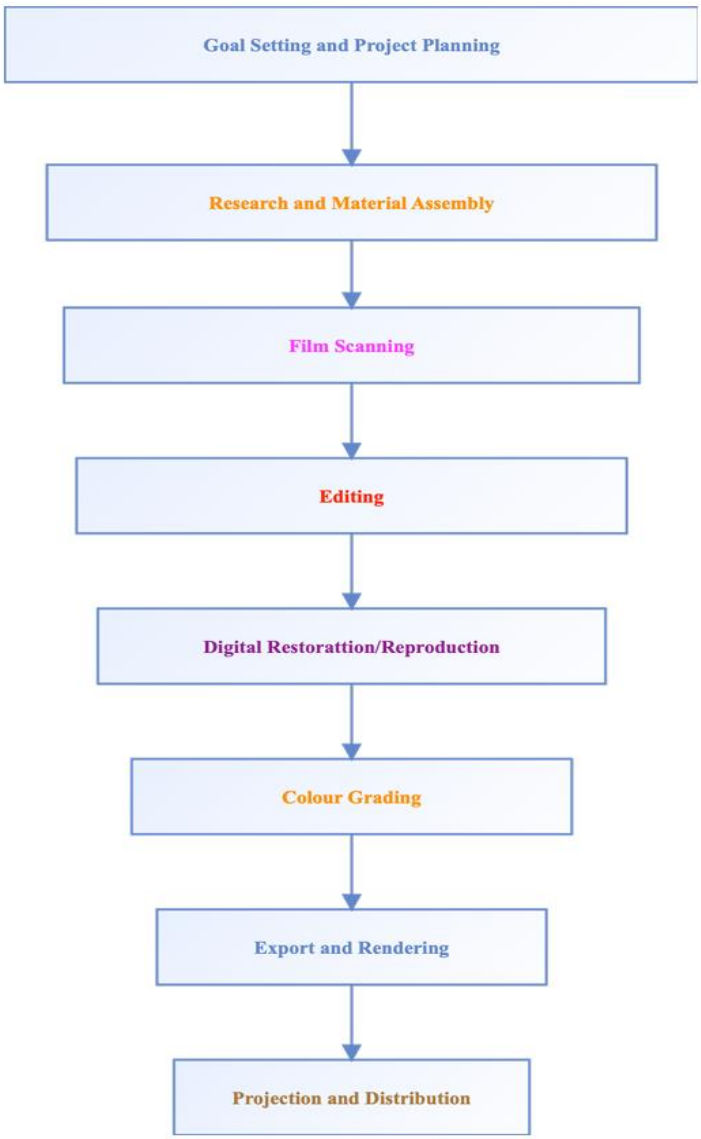

Figure 1: Digital Restoration Workflow
Source: FIAF, designed by Researcher, 2022.

The first step in the digital restoration of *Shaihu Umar* was technical selection which consists of identifying and examining all the extant elements of the film to be restored and it was decided which of the available source material for duplication to form the master element of the restored film. These film elements were selected based on the following factors: the physical and chemical condition of the elements (level of deterioration), as well as the photographic quality (density of the image and loss of details in the 2nd generation- the dupe negative).

For *Shaihu Umar*, the original camera negative was in good condition and was prioritised in the selection process and a dupe negative was completely scanned for the restoration process.

In the repair of *Shaihu Umar*, standard procedure for film treatment was adopted and to improve the quality of the digitally captured image, the repairs were done in two categories: repairs that are required for the element to withstand the mechanical strain of being passed through a scanner and repairs of broken perforation and tear (tape repair) plate 3. The process of *Shaihu Umar* were mostly done with 35mm original camera negative (OCN) and dupe negative which were retrieved from NFVSA vaults in Jos. Treatments were done on both 35mm positive reel with soundtrack(rehydration) due to brittleness while one 16mm positive print with soundtrack was dehydrated due to stickiness at L'Immagine ritrovata in Bologna (plate 4)

Plate 3: *Shaihu Umar* film strip showing various damages and colour fading
Source: Arsenal Institute for Film and Video Art, Berlin.

Plate 4: Dehydrating Treatment of *Shaihu Umar*
Source: Arsenal Institute for Film and Video Art, Berlin

All picture elements of *Shaihu Umar* contain slighter as well as heavier scratches, both on the base and emulsion side (plate 5). The whole digital image restoration was done with the software Diamant (HS-Art). This applies to scratches, dirt, signs of chemical deterioration and so on. The most significant issues during scratch reduction were dust, stabilizing the image on perforation, de-flicker, water stains, blue stains (most probably fungus, that could not be treated) and scratches.

Plate 5: Scene from *Shaihu Umar* showing scratches, loss of picture quality, colour fading (before restoration)
Source: Arsenal Institute for Film and Video Art, Berlin

Plate 6: Scene from *Shaihu Umar* showing scratches, loss of picture quality, colour fading (After restoration) Source: NFVSA, Jos.

During colour grading, only one reference element was used for the grading, and it was the only reel among the positive reels that was not chemically and photographically decayed. The dupe negative has a different density level and translates slightly different in the colour tones. It was attempted to balance the difference between the original camera negative and the dupe negative in the colour grading.

During audio restoration of *Shaihu Umar*, the 16mm and 35mm were scanned at L'Immagine ritrovata in Bologna and compared. The 35mm OSTN (original soundtrack negative) was of better quality and used for the sound restoration using Pro Tools software.

Plate 7: Shaihu Umar: A scene from the OCN and Dupe Neg. before restoration
Source: Arsenal Institute for Film and Video Art, Berlin.

Plate 8: After restoration
Source: NFVSA.

The 35mm original camera negative was scanned in 2K+ so that the actual resolution of the final, framed image is 2K. The data saved from the restoration process is raw scan in DNG files which was rendered into the distribution copies of Digital Cinema Package (DCP), External Hard drive, ProRes files and DVD publications.

CONCLUSION

The uncertain future of celluloid film continues to raise significant concerns, especially as physical degradation resulting from mechanical damage, sprocket tears, oil stains, fungal growth, and improper handling compromises both the integrity and longevity of archival film materials. In the context of Nigeria's film heritage, *Shaihu Umar*, a culturally and historically significant work, serves as a compelling case for understanding the role of digital restoration in safeguarding national memory.

This study focused on the logical processes involved in the digital restoration of *Shaihu Umar*, highlighting how carefully articulated restoration goals, guided by archival theory and restoration ethics, ensure the preservation of original picture quality, color fidelity, and sound. As celluloid faces technological obsolescence, digitisation has emerged as a vital intervention that minimizes damage from repeated projection, extends the lifespan of fragile materials, and significantly improves public access to previously inaccessible content.

However, for digitisation and restoration to be effective and sustainable, several measures are essential. First, there must be adequate investment in archival infrastructure, including modern, climate-controlled storage facilities to prevent further decay of films like *Shaihu Umar*. Second, state-of-the-art digital restoration equipment such as sprocketless scanners like Edeltraud by Kornmanufaktur, Berlin should be procured and properly maintained. Equally important is the training and retraining of archival personnel, equipping them with internationally recognized skills in digital preservation, restoration ethics, and access protocols.

In conclusion, the logical processes in digital film restoration are not universal but rather tailored to the unique needs of each film project and to ensure effective preservation of national cinematic heritage, particularly works of historical value like *Shaihu Umar*, it is imperative that restoration goals are clearly defined and ethically guided. The future of Nigeria's film legacy depends on the collective will to invest in preservation, adopt modern restoration techniques, and develop policies that protect these cultural treasures for generations to come.

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