

Digitization of newspaper for space shaping and ensuring user facility in Dhaka University Library, Bangladesh

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Abstract

Purpose: The digitization and automation functions of newspaper will have an enormous influence on library and information institutions. The purpose of the study is to explore the digitization process of printed newspaper preserved in Dhaka University library.

Methodology: The observational method based on reassessment of the related literature was used in the study. Authors' experiences as well as their managerial and observational involvement in digitization process of printed newspapers is reflected in the study.

Findings: Digital scanners were employed to digitize the newspaper collection, making online accessible scanned editions of printed issues from 1900 to 2022. DocuDex software is used to convert papers, and a sizable, sophisticated scanner is being used to scan newspapers into digital form in Dhaka University Library. Every month, on average, 100–200 scholars use digitized newspapers. A scanner with a camera is used to scan the papers. The scanner operates at a speed of 700 pages per hour (Manually). Apart from scanning newspapers, currently, M.Phil theses, PhD theses, books, and articles are being scanned with this machine.

Research implications: The premeditated approach used in this study can serve the library practitioners to develop a successful transition from traditional systems to a technology based one.

Originality/value: The study is one of the first attempts to trace the implications of newspaper automation in any university libraries of Bangladesh.

Keywords: Digitization, print media, archive newspaper, space shaping, University Library, Bangladesh.

1. Introduction

Newspaper has a great impact on society and its members. Libraries throughout the world and university libraries in particular, are becoming more digitally aware (Jagboro et al., 2012). In response to the worldwide interchange of information and for widespread outreach, hundreds of libraries and related organizations have begun programs to digitize their collections. As almost every area of news collection, production, reporting, and dissemination has undergone significant changes as a result of the digital revolution, the digitization and automation functions of newspaper will have an enormous influence in library and information institutions. They provide a valuable record of the social, political, economic, and cultural issues of the time while also reflecting the daily activities and situations of our ancestors. This is reflected not only in the written content but also in the pictures and advertisements. Because of these factors, newspapers are frequently employed in research libraries to aid in historical investigation (Holley, 2009). In order to preserve historical collections, archives and national libraries all over the world have started digitization projects in recent years. These initiatives allow remote access for a wider range of potential consumers owing to the Internet (Hebert et al., 2014). Digital conservation and archiving of printed newspapers in an information institution is a stimulating assignment as well as a worthwhile opportunity (Kesavan, 2014). These should be microfilmed, then digitized with optical character recognition, identified, and imported into databases. The manufacturing environment must be quick and automated (Bremer-Laamanen, 2006). Researchers have always had a variety of issues in accessing and using historical newspapers effectively. Even the most dedicated researcher faces obstacles because of the dearth of indexes to newspapers, particularly provincial newspapers and those published in the eighteenth and nineteenth centuries (Jones, 2020). However, Dhaka University Library, located in Bangladesh, has taken a significant step towards modernization by digitizing its daily newspaper collection. This initiative aims to shape the library's space more efficiently and ensure convenience and accessibility for its users. By transitioning from physical newspapers to their digital counterparts, the library can overcome various challenges and offer a range of benefits to its patrons.

The purpose of this study is to explore the digitization process of print media preserved in the university library. In the age of rapid technological advancements, libraries are adapting to the digital revolution to provide enhanced services to their users. This article provides an overview of the Bangladeshi newspapers' digitization process in Dhaka University Library for shaping the space and ensuring more facilities of library user. Newspapers have a great impact on society and its members.

2. Literature review

Digital preservation is the process of keeping digital data in digital form so that the information they contain will be usable, durable, and intellectually sound (Nwanapayi, 2016). Numerous studies on newspaper digitalization have been conducted globally.

Riyajuddin (2010) discussed the growth of newspapers in India and the importance of organizing and preserving newspaper resources in libraries. The author recommended modern methods of preservation for newspaper libraries in Andhra Pradesh. The National Library of Finland (NLF) has made several initiatives to provide wider access to digitized Finnish newspapers, benefiting both the general public and researchers (Rautiainen, 2015). (Rahman & Islam, 2020) aimed to build a model for Digital Content Management (DCM) in agricultural university libraries in Bangladesh, focusing on identifying necessary tools and techniques for DCM and addressing the problems and prospects of DCM for enhancing resource sharing among agricultural universities in Bangladesh. (Rahman, 2020) discussed the concept of digital library systems and institutional repositories, highlighting their purposes and features in Bangladesh. It explores the challenges faced by leading libraries in setting up these systems and the initiatives taken to overcome them.

Ifijeh et al. (2015) examined the importance of newspapers to research, education and economic development for Nigeria and advocates the needs to preserve newspapers. They discussed the critical preservation issues related to newspapers. They also recommended that academic libraries in Nigeria should adopt the digitization model for newspaper preservation. Onu (2005) found that newspaper information satisfied readers' needs for education, recreation, research, sport, and culture. Newspaper usage in academic libraries in Nigeria was as high as 77%. Newspapers are crucial components of a library collection in Nigeria that should be preserved for current and future use. Kesavan (2014) presented a case study of digital preservation projects the India Group has undertaken. In addition to skimming over the characteristics of the archival collection, the study clearly laid out the specifics of its various digital preservation activities, highlighting the print media resources that were digitally preserved, characteristics of the digital archival contents, digital archiving processes, access facilities, usage of digital archives, challenges in digital archiving, opportunities and benefits of digitization, etc. Ringel (2021) examined the New York Times as an archive object using three archiving projects. He looked at the conventional 'morgue' of actual newspaper clippings and photographs, the Times' collaboration with Google Cloud to digitize its photo collection, and the Times Machine interactive digital archive, which makes scanned editions of printed issues from 1851 to 2002 available online. Ifijeh et al. (2015) evaluated the value of newspapers for analysis, education, and economic growth and argued that they should be preserved. The writers evaluated the binding preservation technique and spoke about important newspaper preservation difficulties. They advised academic libraries to use the digitization paradigm for preserving newspapers. According to Ugah (2009), University libraries should start developing strategies for the preservation and improvement of access to newspapers by using skilled manpower for suitable planning, microfilming, digitizing, abstracting, and indexing. Sangeeta (2006) studied how easy it would be to access information with the digitization of newspapers. The study talks about how crucial newspaper digitization is to offer efficient library

services. A few national libraries that successfully embark up newspaper digitalization projects are also highlighted in the study. A study of newspaper digitization in the Netherlands was carried out by (Walravens, 2008). The Netherlands' national library launched the Data Bank Digital Daily Newspaper initiative at the end of 2006. Eight million pages, from the first newspaper published in 1618 through the twentieth-century newspaper, will be included in the Data Bank of Digital Daily Newspaper. The study outlined the KB's initiative to establish a network of about forty other Dutch cultural heritage organizations engaged in local newspaper digitization, with the goal of exploring opportunities for collaboration, standardizing the technical approach to digitization, and creating a national portal with access to all historical newspapers that have been digitally preserved.

3. Objectives

The main objective of this study is to explore the digitization process of printed newspaper preserved in the university library. Specifically:

- To highlight the tools used in the digitization process of newspaper.
- To showcase the impact of digitization on library spaces and user experiences.

4. Research methodology

The study utilizes an observational method, which implies that the researchers observed and analyzed the subject of the study in its natural context. The research is based on a thorough review of existing literature relevant to the topic. This involves studying previously published works, research papers, and scholarly articles related to the digitization process of printed newspapers. The authors of the study have practical experience in the digitization process of printed newspapers. Their firsthand involvement in the development of digitization processes adds a valuable perspective to the research. The study includes a description of the authors' experiences in developing the digitization process. This could encompass their roles, challenges faced, and insights gained during their practical involvement. The study also includes interviews with 5 Library and Information Science (LIS) professionals who were actively engaged in the digitization process of Dhaka University Library (DUL) during the specified period (June 2022 to January 2023). These interviews provided firsthand accounts, perspectives, and insights from professionals directly involved in the field.

5. Newspaper digitization

The process of transforming historical newspapers from analog to digital form is known as newspaper digitization. The procedure has seen tremendous modification in the previous few years as funds, scanning technology, and software have permitted (Robinson, 2010). Old newspapers are most frequently found on paper and microfilm, respectively. In order to create text files containing the newspaper content, OCR software is often used to analyze digitized images of newspaper pages. The digitization

of newspapers is an exception to the general rule of digitization (“Newspaper Digitization,” 2023). Basically, the content of old newspapers can be digitized in a few different ways. One method is using a basic home scanner. The newspaper will need to be scanned in portions if it is full-size. The newspaper has a propensity to crumble, and flakes will distort the scan, thus making sure to brush the glass coated off each time before scanning (CMCCONNELL, 2015).

The goals for newspaper digitization are to encourage more users to have access to information; To digitize old newspaper issues in order to preserve and safeguard the nation's cultural and historical heritage, which serves as the foundation for history; Offering a user-friendly interface for searching among the many newspaper titles and accessing the news information; To compile resources on a variety of research and education-related subjects; To have full or partial online access to the content of many newspapers.

6. Technical requirement for Newspaper Digitization (ND)

The following technical points need to be considered in securing full public availability for the newspaper texts: Systematically preparing the original newspapers for scanning or microfilming; High-quality newspaper microfilming; High-quality microfilm or originals scanning; Assurance of the scanned images quality; Scanned images with high-quality Optical Character Recognition (OCR); Some method of zone or segmentation of newspaper pages; Use of software to index individual articles according to subject words; Using software to make it possible to sift through all of the texts; The use of software to house the data and provide Internet access for consumers; Preserving the data for usage in the future.

7. Digitization of Newspaper in Dhaka University Library

By converting physical newspapers into digital formats, Dhaka University Library can free up valuable space within its premises. This liberated space can be utilized for additional resources, study areas, or collaborative zones, providing users with a more vibrant and diverse library experience. Digitization ensures the preservation of delicate and historically significant newspapers. With advanced archival techniques, the library can safeguard these valuable resources for future generations without compromising their quality. Proper digital preservation practices can help overcome the challenges posed by physical degradation, ensuring the longevity of these essential historical records.

7.1 Name of the digitized old newspapers

There are 28 old newspapers are being digitized: Ajker Kakojo, Azad, Azadi, Banglabazar Patrika, Bangladesh Gonohatta, Banglar Bani, Daily Millat, Dainik Bangla, Dainik Barta, Dainik Janata, Dainik Paigam, Dainik Pakistan, Dainik Sangram, Dawn, Gono Kantho, Holiday, Ittehad, Jahane Nau, Morning News, Muktibani, Najat, New York Times,

Pakistan Observer, Purbadesh, Satta Kotha, Sonar Bangla, The Bangladesh Times, and Zamana.

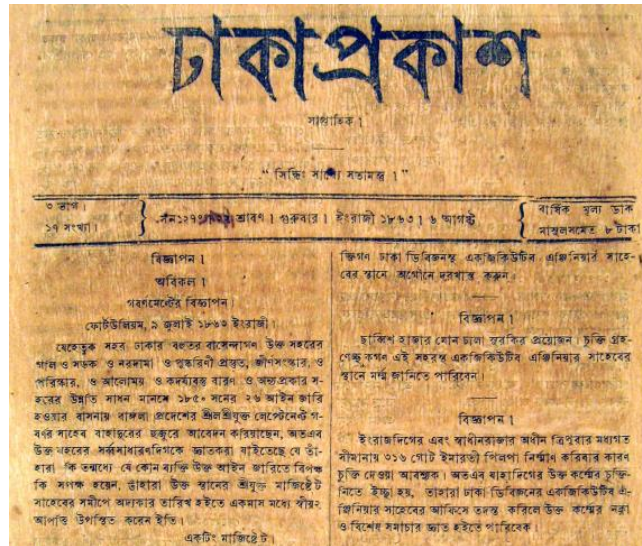


Figure 1: Digitization of old newspaper (Dhaka Prokash, August 3, 1863)



Figure 2: Digitization of old newspaper (Azad Jan 3, 1972)



Figure 3: The old newspaper the Dawn (Jan 2, 1970)

7.2 Name of the digitized contemporary newspapers

There are 10 contemporary newspapers that are being digitized: The Bangladesh Observer, The Daily Star, Daily Prothom Alo, Daily Inqulab, Daily Ittefaq, Daily Jugantor, Daily Janakanto, Daily Samokal, Daily Sangbad, and Daily Kaler Kontho. Since 2017, the newspapers have been scanned by the ATIZ Book Drive Mark-2 scanner machine.

7.3 Digital scanners

Digital scanners were employed to digitize the newspaper collection, making online accessible scanned editions of printed issues from 1900 to 2022. The scanner is an ATIZ Book Drive Mark-2 with a camera that was made in Thailand. The scanner operates at a speed of 700 pages per hour (Manually). Apart from scanning newspaper, currently, there are 1,234 copies of M.Phil theses, 956 copies of PhD theses, 2,434 copies of books, and 5,700 copies of articles that have been scanned with this machine.



Figure 4: ATIZ Book Drive Mark-2 Scanner

7.4 Digitization software

DocuDex software has been used to convert 5,700 papers, and a sizable, sophisticated scanner is being used to scan newspapers into digital form in Dhaka University Library. Every month, on average, 100–200 scholars use the digitized newspapers. It is evident through staff interviews and document analysis that the digital archive is not an exact replica of printed newspaper when it comes to newspaper archiving procedures in the past and present. There are a sizable number of paper records kept in physical archives that have not been converted to digital format; their loss would be costly for both media academics and historians.

7.5 Digitization process

In an effort to preserve and make historical newspapers easily accessible to researchers, students, and the public, Dhaka University Library embarked on a significant digitization project. Leveraging the cutting-edge technology of the ATIZ Book Drive Mark-2 Scanner, equipped with a high-resolution camera made in Thailand, and supported by the powerful DocuDex software, this project aimed to convert printed newspapers into digital form. The digitization process not only preserved the fragile physical copies, but also made them searchable, thereby enhancing the efficiency of research and historical analysis. Before digitization, the newspapers had to be carefully prepared to ensure optimal results during the scanning process. Fragile and deteriorating newspapers were restored and reinforced with acid-free archival materials to prevent further damage during handling. The ATIZ Book Drive Mark-2 Scanner was set up in a dedicated digitization room at the library. Trained personnel operated the scanner, ensuring the newspapers were handled with utmost care. The ATIZ Book Drive Mark-2's V-shaped cradle allowed for gentle and precise page turning without causing any harm to the originals. The high-resolution camera from Thailand, integrated into the scanner, played a crucial role in capturing clear and detailed images of the newspapers. This ensured that even the smallest font sizes and intricate illustrations were accurately preserved in digital form.

Following the scanning process, the captured images were imported into the DocuDex software. This sophisticated software used Optical Character Recognition (OCR) technology to convert the scanned images into searchable and editable text documents. The OCR engine in DocuDex was capable of recognizing a wide range of languages, including Bengali, making it suitable for the library's needs. After OCR conversion, library staff meticulously reviewed and corrected any errors in the digitized content to maintain accuracy. The software also allowed for image enhancement and other post-processing techniques to improve the overall quality of the digitized newspapers. The digitized newspapers were stored in secure and redundant data storage systems, ensuring their long-term preservation. To enable easy access for researchers and the public, the digital archives were integrated into the library's online catalog and made available through a dedicated portal on the library's website. In order to make a newspaper

digitized, the following digitization processes must take place: the microfilm copy, master and Web image, metadata, page, and article of newspaper, OCR software, and OCR text (Allen, 1999).

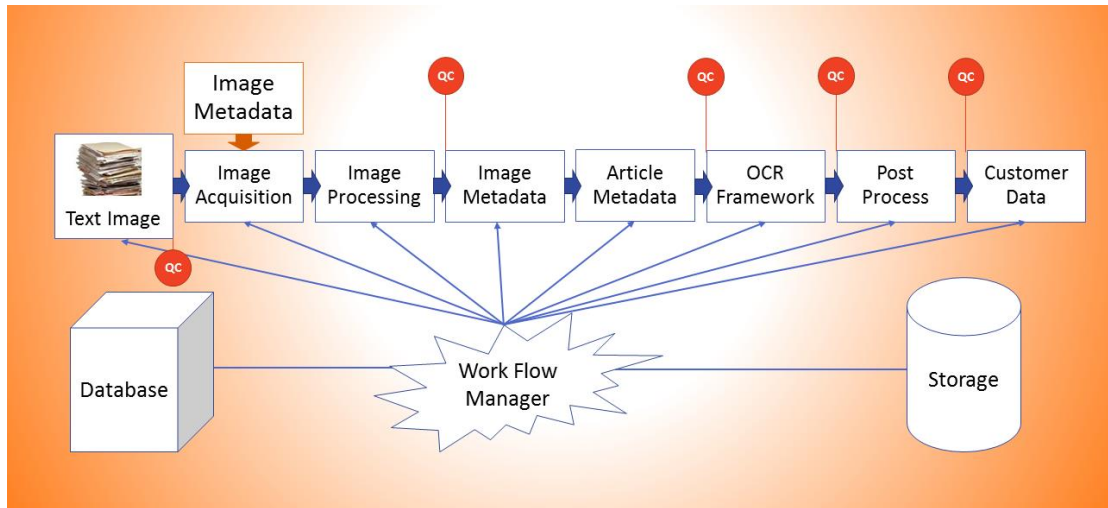


Figure 5. Newspaper scanning process/work flow. (Source: Gosfordmicrographics)

By converting delicate newspapers into digital format, the physical copies were protected from further wear and tear. Scholars and researchers could now access the newspapers remotely, saving time and resources for in-person visits. The OCR-enabled text allowed users to search for specific keywords or topics within the newspapers, enabling efficient research and analysis. Digital archives facilitated easy sharing of historical information among researchers and institutions, promoting collaboration and academic exchange (Ehrmann, Bunout, & Clavert, 2023).

7.6 Impact of digitization of newspaper

In order to ensure the durability of a digital asset, digital preservation is a crucial and important component of digital archiving (Nwanapayi, 2016). Digitizing the daily newspaper collection offers a multitude of advantages, revolutionizing the way users interact with information. The need for newspaper digital archives is being driven by the rise in interest in primary source material, the growing impatience with manual searching, space savings, the necessity to maintain and archive in numerous formats, and the expectations of scholars (James-Gilboe, 2005). Newspapers and journals are being rapidly digitized, making even recent history seem exotic (Nicholson, 2013).

Digital newspapers can be accessed remotely, eliminating the constraints of physical boundaries and operating hours. Users can retrieve newspapers anytime, anywhere, using computers or mobile devices connected to the library's online platform. This

accessibility empowers researchers, students, and scholars, allowing them to explore a vast range of news articles and conduct comprehensive studies with ease. Digitization enables the implementation of powerful search features and indexing capabilities. Users can employ keyword searches, filters, and metadata to locate specific articles, topics, or dates efficiently. This streamlined search process enhances research efficiency and saves valuable time for library users.

Dhaka University Library's digitization initiative contributes to the preservation of Bangladesh's rich cultural heritage. Historical newspapers hold immense value in documenting societal, political, and economic changes over time. By digitizing these newspapers, the library ensures that future generations can explore and learn from the nation's history.

8. Research limitations/implications

The premeditated approach used in this study can serve the library practitioners in the work of librarianship to develop a successful transition from traditional papers to technology based. The article lacks quantitative data to support the claims and benefits mentioned. The article generalizes the benefits of digitization without acknowledging potential challenges or drawbacks.

Despite the noted limitations of the article, such as the absence of quantitative data to substantiate the benefits and the potential oversimplification of the digitization process, the research on Digitization of Newspaper for Space Shaping still holds significant value because of its contextual relevance, qualitative insights, pioneering efforts, and contribution to knowledge dissemination underscore its value in advancing the discourse and practice of librarianship, particularly in the context of Dhaka University Library and similar institutions.

9. Recommendations

Based on the above discussion, objectives and incorporating interview data, following suggestions are recommended:

9.1 Optimization of digitization tools: The university library periodically assesses and optimizes the tools used in the digitization process. This may involve staying abreast of technological advancements and considering tools that enhance efficiency, accuracy, and preservation quality.

9.2 Training programs for library staff: Dhaka University authority should conduct training programs for library staff involved in the digitization process. Providing ongoing training will enable staff to effectively utilize the digitization tools, ensuring the quality of the digitized content.

9.3 Collaboration with technology experts: Library authority can strengthen collaboration between the library and technology experts to enhance the digitization process. Engaging with experts in technology can provide valuable input on optimizing workflows, troubleshooting technical issues, and ensuring the long-term sustainability of digitized archives.

9.4 User-centric design of digital platforms: Recognizing the impact of digitization on library spaces and user experiences, it is recommended to adopt a user-centric approach in designing digital platforms. Introducing user feedback sessions and conducting usability studies to customize digital interfaces, ensuring they align closely with the specific preferences and expectations of library users for a more tailored and user-friendly experience.

9.5 Accessibility and inclusivity considerations: Attention needs to be paid to accessibility and inclusivity in the digitization process. Interview data highlighted the need to consider diverse user groups. It needs to be ensured that digitized content is accessible to individuals with varying abilities and that the digital platforms accommodate different learning styles and preferences.

9.6 Regular assessment of user experiences: A system for regular assessment of user experiences with digitized newspaper archives should be implemented. Insights from interviews stressed the dynamic nature of user expectations. Feedback mechanisms should be established and surveys or focus groups need to be organized to gather user perspectives and adapt the digitization process based on evolving user needs.

9.7 Preservation strategies for digital collections: Dhaka University authority can develop robust preservation strategies for the digital collections. Protocols need to be established for regular backups, format migration, and monitoring of the digital archives to ensure the continued accessibility and integrity of the digitized newspaper content.

9.8 Integration of multimedia elements: The integration of multimedia elements in the digitization process should be considered. The incorporation of audio, video, or interactive elements need to be explored to enhance the richness of the digitized newspaper archives, providing users with a more immersive experience.

These recommendations aim to address key aspects of the digitization process, drawing insights from both the literature review and the practical experiences shared through interviews with LIS professionals involved in the digitization process of Dhaka University Library.

10. Conclusion

The digitization of the daily newspaper collection at Dhaka University Library is a significant step towards shaping library spaces and ensuring user convenience. This forward-thinking initiative optimizes resource allocation, enhances accessibility, and preserves historical records. By embracing digitization, the library paves the way for a more inclusive, technologically advanced, and user-centric environment, firmly positioning itself at the forefront of the digital transformation in the academic library landscape of Bangladesh. The digitization process of newspapers at Dhaka University Library, made possible by the ATIZ Book Drive Mark-2 Scanner with a Thai-made camera and the powerful DocuDex software, marked a significant milestone in preserving and promoting historical newspapers. By transforming physical copies into digital archives, the library not only safeguarded valuable historical records but also opened up new avenues for research, analysis, and public access to this treasure trove of information.

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