

## Research Article

# Digitization of Gray Literature in the Library of the National Research and Innovation Agency

Rosiana Nurwa Indah<sup>1\*</sup>, Aullya Shabillina Napaulin Bona Geddy<sup>2</sup>, Fitri Anggraeni Rusli<sup>1</sup>, Rifqi Zaeni Achmad Syam<sup>1</sup>

<sup>1</sup>Program Studi Ilmu Perpustakaan Universitas Islam Nusantara, Indonesia

<sup>2</sup>Badan Riset dan Inovasi Nasional, Indonesia

**ORCID**

Rosiana Nurwa Indah: <https://orcid.org/0000-0003-4771-8493>

**Abstract.**

The research aims to determine the process of digitizing the gray literature collection carried out by the Bandung Djunjunan National Research and Innovation Agency Library. A descriptive qualitative method is used in this research. Data were collected through observation, interviews, and literature review. There were three informants in this study. Data analysis through data condensation, data presentation, and drawing conclusions. The research results show that the digitization of the gray literature collection was carried out as an effort to preserve and disseminate the information contained in the collection. The stages of digitizing the collection are preparation, digitization process, editing and validation process, as well as the upload process to Repokarya. The gray literature collection that has been digitized is not stored in the library but is handed over to BRIN's BMN (State Property Services) service. The obstacles in implementing digitalization are limited facilities and infrastructure as well as human resources.

**Keywords:** digitalization, gray literature, national research and innovation agency library

## 1. Introduction

Libraries in general are a place that cannot be separated from information media. The essence and function of the library as a storage place for any information media can indeed be said to be something that may be known. A library is an institution/institution where various information media are stored as part of the aim of providing information services and convenience for every individual. The library is an information center that acts as a provider of information services and also implements the management and preservation of information so that it can become a source of knowledge [6].

An information medium contained in a library can include various collections stored there. Each collection has its own value which has gone through a selection process until finally it becomes a collection stored in the library. A library collection is library material

Corresponding Author: Rosiana Nurwa Indah; email: [rosiananurwaindah@uninus.ac.id](mailto:rosiananurwaindah@uninus.ac.id)

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that has been acquired in various forms such as books, research results, reports and other library materials that have use value which will then be managed and stored so that it can be serviced so that it can meet users' information needs [1]. One type of collection that is currently always available in every library is generally gray literature. Gray literature or gray literature is typical literature from an institution published by that institution with the aim of becoming a useful and valuable value and heritage related to that institution [19]. Gray literature usually consists of journals, theses, dissertations, reports, symposiums, proceedings, and other texts related to and published by the institution.

In general, gray literature has its own use value which is something special that is not found in current collections. That's why there are still many libraries that maintain and store gray literature collections even though they are generally in an outdated physical condition. In this case, the library here certainly does not only act as a storage place for gray literature collections. Understanding this, in fact, it is necessary to know more deeply that the library is a documentation center which is not only a storage place but also includes aspects of management of each stored collection. The library is a documentation center that includes both collection and management and services of the collection [5].

Each collection in a library will certainly have its own management in the form of care and preservation, especially for the gray literature collection. This management is particularly evidenced by the existence of a preservation policy in a library. Preservation is an action to preserve every collection in the library so that it can protect the function, purpose and use value of the collection. According to Lasa [13] states that preservation is a method implemented to preserve collections. So, with preservation, the use value and information content of a collection can be maintained and utilized.

Collection preservation activities include various things that can be done to protect and preserve collections. One of the preservation activities that can be carried out on gray literature is through digitizing the collection. Digitalization is a process of transferring printed material media into digital form. Digitalization is a conversion of printed media through scanning so that a result can be displayed digitally [15]. Basically, this digitalization effort is one of the things that is currently adapting to technological developments. With digitalization, gray literature collections can also be presented digitally and can be accessed easily by various parties.

One of the libraries currently carrying out preservation efforts is the Bandung Djunjunan Regional Research and Innovation Agency (BRIN) Library. The existence of library relocation activities that will be carried out also considering the large number of gray

literature collections in the library certainly requires action to save and preserve the collection. In this case, the library is making efforts through digitizing collections to facilitate relocation activities as well as saving and preserving the gray literature collection in the library.

Based on this background, in this case the researcher is interested in knowing how preservation actions in the form of digitization are carried out by a library, especially for gray literature collections. The Bandung Region National Research and Innovation Agency (BRIN) Library as a special library under an institution is also an interesting thing in making this effort. Therefore, researchers here are trying to examine in more depth how digitization is a form of effort to preserve the gray literature collection at the National Research and Innovation Agency (BRIN) Library in the Bandung Djunjuran area.

There are several previous studies that first studied the topic to be researched, namely as follows. The first research was by [10] with the title “Preservation of Gray Literature Collections in Disaster Preparedness in Higher Education”. In this article, the preservation of the gray literature collection is explained, including several activities, namely the preservation, preservation and repair stages. Actions from these activities include the process of digitizing collections, eradicating collection-destroying animals, binding collections, restoring damaged pages, and maintaining the library environment.

The second research with the title “Efforts to Digitize Local Content Collections at the Pekalongan City Regional Library and Archives Office” [20]. Based on the results of this research, it is known that digitalization is one of the preservation measures and efforts to preserve use values, information and heritage. Digitalization is at least carried out through preparation and implementation stages. In the preparation stage, namely by preparing supporting devices, such as hardware and software. The next stage is the implementation stage by scanning, editing, flipping books, and updating.

The third research with the title “Digitalization of Local Content Collections in Higher Education Libraries” [18]. Digitization activities in this case are an effort and form of preservation in the library. The collection digitization process is carried out through several stages, namely pre-digitization, digitization, and post-digitization. The pre-digitization stages include document collection, dismantling of document binding, and software installation. Next, the digitization stage involves scanning, editing and uploading. Finally, at the post-digitization stage, namely re-binding and storing printed collections.

The results of this research contain the same goals of digitization as an effort to preserve existing collections in libraries. In the results of this research, generally the

TABLE 1: List of Informants.

No	Inisial	Jenis Kelamin	Jabatan
1	ASN	P	Pustakawan
2	DWAN	L	PIC
3	RSP	P	Internship

Source: Writer, 2023

digitalization process shows almost the same process. Some other similarities are that collections in the form of gray literature and local content are both collections published by an institution and related to that institution. What will differentiate this research is that the research was carried out in a special library, namely the National Research and Innovation Agency (BRIN) Bandung Djunjuran Area Library.

## 2. Methods

The method used in this research is a case study method with a qualitative approach. The case study method is a method aimed at studying an activity and situation based on the urgency and support of the situation [9]. Meanwhile, according to Stake [11], the aim of a case study is to explain the characteristics of a phenomenon and research object. Meanwhile, a qualitative approach is used so that you can research more deeply and participate actively in the research. A qualitative approach will make researchers participate interactively in the research process [9]. Qualitative will also provide an understanding of the researcher's knowledge which will be perceived from interactive results and interpretations in research [8].

This research was carried out in May 2023 at the Bandung Area Library of the National Research and Innovation Agency (BRIN). The data collection techniques used were through observation, interviews and literature study. The data analysis technique used was using the Miles, Huberman, & Saldana model [12], namely data condensation, data presentation, and drawing conclusions. The informants taken were several parties who currently manage the BRIN library, namely as follows.

## 3. Results and Discussion

The National Research and Innovation Agency (BRIN) is a non-ministerial state institution that functions as a national research, development and study institution that is directly responsible to the president. The National Research and Innovation Agency (BRIN) itself

was formed in 2021 by combining several research and study institutions, including the Institute for Science and Information (LIPI), the National Institute of Aeronautics and Space (LAPAN), the National Nuclear Energy Agency (BATAN), and Agency for the Assessment and Application of Technology (BPPT). These institutions, which have now been merged into BRIN, certainly have their own research tasks and functions, each of which cannot be separated from the existence of a library.

The Bandung Djunjuran Region National Research and Innovation Agency (BRIN) Library is one of the multi-units under the auspices of the Directorate of Repositories, Multimedia and Scientific Publishing at the National Research and Innovation Agency. This library is one of the multi-unit work units of the BRIN Library in other Bandung areas, namely the Cisitu and Tamansari areas. This library was previously a library under the National Aeronautics and Space Agency (LAPAN) as the location of the library was previously the LAPAN area of Bandung City and is now the BRIN Bandung Djunjuran area. In particular, this library carries out functions and duties to be able to serve in facilitating and providing information supporting research and assessment of the BRIN community as well as the duties and functions of the National Research and Innovation Agency itself.

In carrying out its duties in providing information services, the National Research and Innovation Agency (BRIN) Library certainly has a vision that is needed to achieve the target of satisfaction from the library services provided. Before that, a library certainly had risks that could threaten any aspect of the information available in a collection. That's why libraries carry out a preservation process and various collection preservation efforts. In this case, the National Research and Innovation Agency (BRIN) Bandung Djunjuran Library is providing digitization efforts for its gray literature collection.

Gray literature is a collection that is generally published by an institution/institution as a collection that can be utilized by that institution [16]. Gray literature contains research results that are officially published in the publications of an institution or research institution. Based on research results, the National Research and Innovation Agency (BRIN) Library has a collection of research results from researchers in the form of books, anthologies, proceedings and journals. The information contained in the gray literature collection is the result of research related to astronomy, the ionosphere, geomagnetism, observatories, electromagnetics and outer space which includes studies of the sun, stars, planets and the solar system. The aim of preserving the gray literature collection is to create dissemination of knowledge, especially knowledge of research results from BRIN Area researchers. Apart from that, it also aims to save the information contents of the collection from damage [2]. This is because collection preservation is an effort

to save materials or objects from damage. This is in accordance with the following informant's statement:

*"The aim of this digitalization program is to disseminate knowledge from research results. So it can be used as a reference for conducting other research. "Moreover, currently BRIN researchers and employees can work anywhere or Work From Anywhere (WFA), so this digitalization means that information can be accessed anywhere and at any time," (ASN/P/Librarian).*

Based on the statement above, it can be seen that the digitalization of this collection is not only intended as an effort to preserve the knowledge stored in the collection, but also to support the WFA work system implemented at BRIN. This means that knowledge dissemination activities can still be carried out without users having to come to the BRIN library. The dissemination of this knowledge also makes a major contribution in building new knowledge through the synthesis of the available gray literature collections. This is because Gray literature has very useful benefits in providing a means of scientific communication and fulfilling the information needs of readers [3]. Apart from that, the digitalization program also aims to provide knowledge to the public through libraries because this is in accordance with BRIN's role as an institution that develops knowledge and has information assets.

*"... the public as well as academics and researchers in other places, they need to know that BRIN has information assets... Moreover, the public can see, BRIN, yes, BRIN's work is big. So, we from the library side need to help, support to disseminate the information we have," (DWAN/L/PIC).*

This statement can give the perception that here the BRIN library specifically shows the role they want to provide to the wider community. Maintaining BRIN's existence also brings BRIN's name as one of the institutions that can provide aspects of information services through digitalization activities. This digitization program is also one of the achievements of the BRIN RMPI Directorate which oversees all libraries in the BRIN area. The new achievements and focus with digitalization can be said to be something that can have its own positive impact. The digitalization policy that has been going on since last year also has the benefit that there are already many collections that have been digitized and can be serviced. As of May this year, in the Djunjunan area alone hundreds had been digitized.

*"Perhaps at the beginning of May, there were around 114 proceedings and 773 articles," (DWAN/L/PIC).*

The preservation policy through digitalization is also an adaptive form of BRIN libraries to be able to keep up with developments in the current era which has entered the

digital era. This is what makes librarians and related parties have a vision of providing digital collections to suit the needs and obtain satisfaction from library users. This is in accordance with the following informant's statement:

*"Now the term is the digital era, yes, there are digital libraries. Well, the term we also want to not only have a physical collection, but we also want to have a digital collection. Physically, it can only be accessed in one place, in the library, in one location. "But if, for example, the collection is in soft file or digital form that can be accessed anywhere, we will have a varied collection," (ASN/P/Librarian).*

The era of digitalization is indeed one of the most significant influences on various fields. Information and communication technology is one of the supporting factors which is driving digitalization. The ease of access created by this is a major influence on libraries. Through this technology, the demand for libraries to be able to keep up with technological developments is necessary. Flexibility and efficiency in being able to access collections anywhere and at any time are also important considerations so that collections can be accessed and presented easily. So it could be said that consideration of space and time is also a supporting aspect. This is also in accordance with the statement [14] which states that digitalization is a process of utilizing technology that produces new value and opportunities. Apart from that, according to [17] the use of Information and Communication Technology will make it easier for human resources in libraries, namely librarians, to carry out their duties and speed up their services.

The existence of this digitization program is also a solution to the problem of lack of space and the uncertain location of the library to store the gray literature collection which is increasing as a result of the policy of merging various research and information institutions. This is in accordance with the following informant's statement:

*"Maybe it's also because in Bandung we definitively don't have a definite location to store physical collections, that's why we like setting this place, we save space, especially since our physical library needs a large place and space. "That's why, by digitizing it, the spaces that were initially needed as physical spaces for collections will later be reduced a lot or even no longer needed..." (DWAN/L/PIC).*

Furthermore, it is known that preservation efforts through collection digitization are carried out only on gray literature or local content collections. This raises a question about the reasons for this factor. Meanwhile, we can first examine that gray literature, which is a collection published by the institution itself, is certainly the easiest answer to perceive. This is none other than because this will not cause problems related to copyright. Moreover, collection digitization activities in libraries are a collection



preservation process by changing the collection format or information media in the library into electronic form [4].

*“For me, copyright is the most important thing, because not all books can be digitized and then shared. However, if it is local content, the term is definitely safe,” (ASN/P/Librarian).*

*“...this is copyright, because there is an opinion that says that if we digitize outside of that institution we have to get permission from the author. “Even though it’s still being debated, some allow it, some don’t, but it’s still debated among libraries to digitize complete collections that don’t belong to us,” (DWAN/L/PIC).*

Based on the statements above, we can see that copyright issues are also the main reason. Even though it is still a matter of debate and there are those who allow it, copyright itself is a sensitive issue. This is a consideration for focusing on gray literature collections in digitalization activities. Apart from that, in terms of the time available, it is also not possible to add other collections outside of gray literature to be digitized. This is in accordance with the following informant’s statement:

*“...apart from gray literature, it will definitely take more time, now we are just doing gray literature with the help of our street vendor friends and it won’t be finished in a year,” (DWAN/L/PIC).*

There are various considerations in implementing the digitization of collections in the BRIN Library in accordance with Surachman’s statement [4], which states that, in implementing digitization, several considerations need to be formulated, namely the strength of the collection, the uniqueness of the collection, the priority of the user community, and the capabilities of employees. This is because not all collections are easy to digitize. Apart from that, collection digitization activities take a long time so patience and teamwork are needed. This shows that digitizing collections, which is part of collection preservation activities, has a social function. According to Martoadmojo [7], social function, namely moral actions that encourage librarians to collaborate in preserving collections.

In carrying out the digitization process, there are several implementation stages that are carried out to be able to digitize the collection. In general, the digitalization stage carried out is the preparation stage. At this stage, the collection to be digitized is selected and reviewed again to ensure that the collection is included in the gray literature collection and to prepare the tools that will be used in the digitization activity. The second stage is the digitalization implementation stage. At this stage, the process of scanning the collection is carried out which will be digitized using a scanner. The third stage is the editing and validation stage. At this stage, the editing and validation



process is carried out from the digitization results that have been carried out to obtain maximum results which are then saved on Google Drive. The fourth stage is inputting and uploading the results of the digitalization of the collection to the BRIN repository. Repokarya is BRIN's Karya Repository which functions to store various digital collections at BRIN which can be accessed at <https://karya.brin.go.id/>.

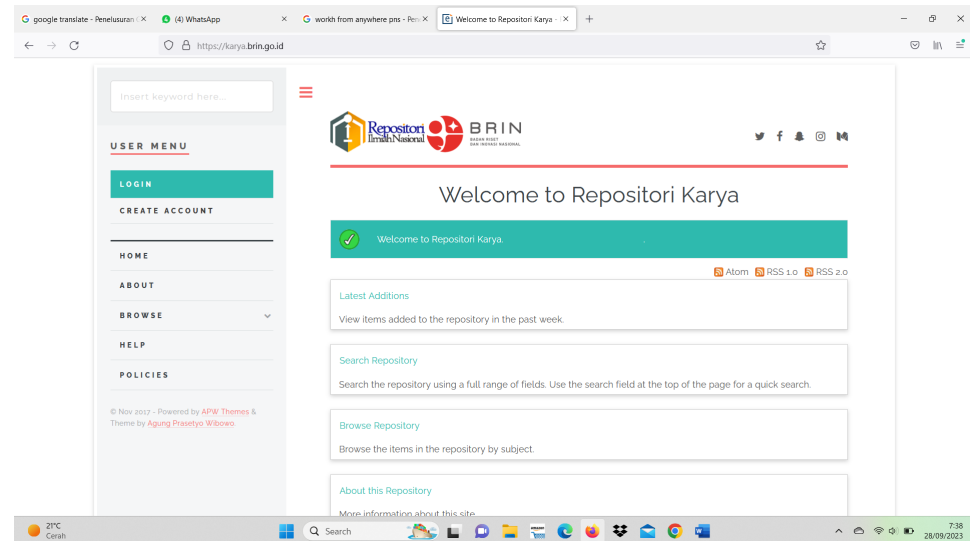


Figure 1: BRIN Repokarya (Source: BRIN, 2023).

After the digitization process takes place, there will be follow-up for each collection that has been digitized. The gray literature collection that has been digitized is not stored in the library but is handed over to BRIN's BMN (State Property Services) service. This is because to realize the aim of the digitalization policy as a solution to space constraints so that the printed collections that will be stored in the library are not collections that are included in the gray literature collection. In addition, all gray literature collections are produced using state money so they need to be returned to the state for further follow-up. This is in accordance with the following informant's statement:

*"We will weed the physical collection, of course we are not directly responsible for the physical collection. We will hand it over to the BMN, State Property Services, they are the ones who will manage it, they are the ones who have to, usually there are special procedures for assets, those are collection assets, those who provide the assets are also gutu, these collection assets will be whatever, we hand it over to BMN. Usually later, if for example there is a BMN number, there will be a deletion process, if for example there is no BMN number, it may be thrown away or handed over. "But, usually there will be a removal process like that by friends at BMN, that's the physical thing," (DWAN/L/PIC).*



**Figure 2:** Digitalization Collection of the BRIN Bandung Djjunjunan Library (Source: Personal Documentation, 2023).

In implementing the digitization of the gray literature collection, several obstacles were also encountered, namely limited facilities and infrastructure as well as human resources. The obstacle to facilities and infrastructure is the lack of representative equipment and space that can support the implementation of collection digitization. In facing these obstacles, librarians utilize existing facilities or use smartphones and modified parts of the library to carry out digitalization activities. The problem with limited human resources is the imbalance between the gray literature collection that will be digitized and the number of librarians available. Moreover, librarians also have other tasks that must be carried out, such as servicing and processing library collections. In overcoming this obstacle, BRIN librarians created an implementation schedule so that all librarians could come together to carry out digitalization activities that required teamwork. Apart from that, the library also collaborates with universities to collaborate on student internships to support the gray literature collection digitization program.

## 4. Conclusion

The digitalization activity of the gray literature collection which has been carried out by the National Research and Innovation Agency (BRIN) Bandung Djjunjunan Library aims to preserve the information in the collection so that it is not lost or damaged. Apart from that, it is also an effort to disseminate knowledge resulting from researchers' research which is BRIN's information asset so that it can be used by the BRIN community who work from anywhere and the wider community. The stages of digitizing the collection are preparation, digitization process, editing and validation process, as well as the upload process to Repokarya. Until now, BRIN's Repokarya continues to undergo improvements so that it can function optimally. The gray literature collection that has been digitized is

not stored in the library but handed over to BRIN's BMN (State Property Services) service. In this digitalization process there are several obstacles, namely limited facilities and infrastructure as well as human resources. However, these various obstacles can be overcome by maximizing existing resources. In this way, digitization activities of gray literature collections can continue to be carried out at the Bandung Djunjunan Area National Research and Innovation Agency (BRIN) Library.

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