E-Resource Management Model in Indonesian Libraries: A Case Study on BRIN Library

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Notes	ABSTRACT
  	The National Research and Innovation Agency of Indonesia (BRIN) is aware of the changes in the information/reference-seeking behavior of BRIN researchers, where many refer to electronic journals as references for their scientific work. Therefore, BRIN has implemented a new policy in procuring its library collections, namely by no longer carrying out procurement in printed form but rather digital/electronic. This research aims to determine the readiness of the BRIN library in e-resource services so that it can be used as material for evaluation and improvement of the BRIN library. This research method uses a qualitative approach with a case study type. Data collection was carried out using semi-structured interviews, observation, and documentation. Data analysis uses the Strauss and Corbin analysis models, starting from open coding, axial coding, and selective coding. Triangulation of sources and techniques is used to maintain the validity of the data provided. The results of this research can be used as a reference and framework model that can be applied in libraries to manage their e-resources well. Future research can test whether this model can effectively manage e-resources. **Keywords:** E-resources; electronic resource management; special library

1. INTRODUCTION

Libraries are experiencing major changes in collections development and services such as acquiring e-resources. It is caused by technological developments and digital format changes

(Bentil et al. 2020). The increasing number of publishers and vendors offering electronic resources (e-resources) also support trend libraries (Verminski et al., 2017).

The libraries need to be adapted to manage and provide e-resources that are relevant to the user. They are a challenge for e-resources management. Several studies reveal that in developing countries, academic libraries struggle to manage e-resources. There are many challenges and obstacles experienced by libraries in managing e-resources. For example, limited budget, human resources, and infrastructure (Pandey, 2018; Verminski et al. 2017). Furthermore, with the emergence of new technology, libraries are required to be able to create a global window to access information quickly without consuming time.

Therefore, one of the efforts made by libraries so that e-resources are managed efficiently and effectively is by following standard procedures by complying with the stages in the ER life cycle framework. However, in practice libraries do not follow the ER life cycle stages perfectly. It can be found at several libraries in Ghana.

E-Resource Management Systems (ERMS) have a vital role in libraries. Having a system/application will make it easier for librarians to manage e-resources. ERMS has long been available both paid and free (open source). ERMS facilitates the acquisition and licensing of electronic resources. Its function is to simplify the acquisition process by allowing administrators to track licenses, subscription terms, and costs. This centralization minimizes duplicate purchases and optimizes budget allocation.

Additionally, ERMS helps maintain a well-organized repository of electronic resources. This system allows librarians and administrators to categorize resources, assign metadata, and manage access rights. This setting increases the discoverability of material, making it easier for users to find relevant information quickly. Through integration with cataloging systems, ERMS ensures that e-resources are seamlessly integrated into the library's existing infrastructure. ERMS is an important tool for institutions that manage electronic resources, such as Koha, CORAL, and FOLIO.

Determining the "best" ERMS depends on a variety of factors, including the library's specific needs, preferences, and requirements. Each system has its strengths and features. It is recommended to evaluate each system based on criteria such as user interface, integration capabilities, scalability, customer support, and cost. Moreover, it is also worth reading reviews from users who have utilized this system to gain insight into their experiences. Ultimately, the best choice will depend on how well a particular ERMS aligns with each library's unique needs and priorities.

In Indonesia, academic and special libraries that subscribe to e-resources have experienced an increase, including The National Research and Innovation Agency (BRIN). BRIN has adopted a policy to only procure collections in the form of e-resources by looking at trends in internet use among researchers. The researcher uses BRIN as a research object to carry out in-depth research on e-resource management practices. The study aim can be used as a reference and framework model that can be applied in libraries to manage e-resources.

2. METHODS

The study used a qualitative approach with a case study. A qualitative approach examines the condition of natural objects, namely the researcher as the key instrument, inductive data analysis, and the results emphasize meaning (Sugiyono, 2017).

Case studies (single case) are selected to explore real-life, contemporary bounded systems (cases), through detailed and in-depth data collection involving multiple sources of information, and reporting case descriptions and case themes (Creswell, 2015). Data collection was conducted by online interviews and documentation. Online interviews are structured, semi-structured, or unstructured interviews. Interviews are conducted in real-

time/synchronously (via video, webcam, web conferencing, live chat, instant messaging) or asynchronously (via email, video recording, microblog, wiki/discussion column) (Dawson, 2020). Researchers have chosen semi-structured interviews using guidelines that contain outlines of the problems to be asked. One person as a key informant was chosen with purposive sampling.

Documentation takes the form of collecting public documents (newspapers, papers, and office reports) or private documents (diaries, diaries, letters, e-mails) (Creswell, 2016). Documentation is carried out by collecting documents regarding policies, procedure manuals, and photos of activities carried out by the BRIN Library and its divisions. BRIN Website for E-resources that can be accessed privately or only members was captured to support research data.

Strauss & Corbin's (1990) coding stages were used for data analysis. 1) Open coding, interactions/actions/activities regarding e-resource management in the BRIN library are grouped to be categorized and subcategorized. 2) Axial coding, a coding paradigm is carried out for conditions, context and strategies, consequences, and sub-categories related to a category. 3) Selective coding is the process of uniting categories into core categories and explaining them explicitly through detailed descriptions.

According to the coding process, several themes emerge during open coding (see Table 1.). The coding will be poured into the result and finding analysis (open and axial coding). It contains interpreted interview results and linked theory. The Selective coding will be presented in the discussion.

Table 1. Emerging themes that emerge in the coding process

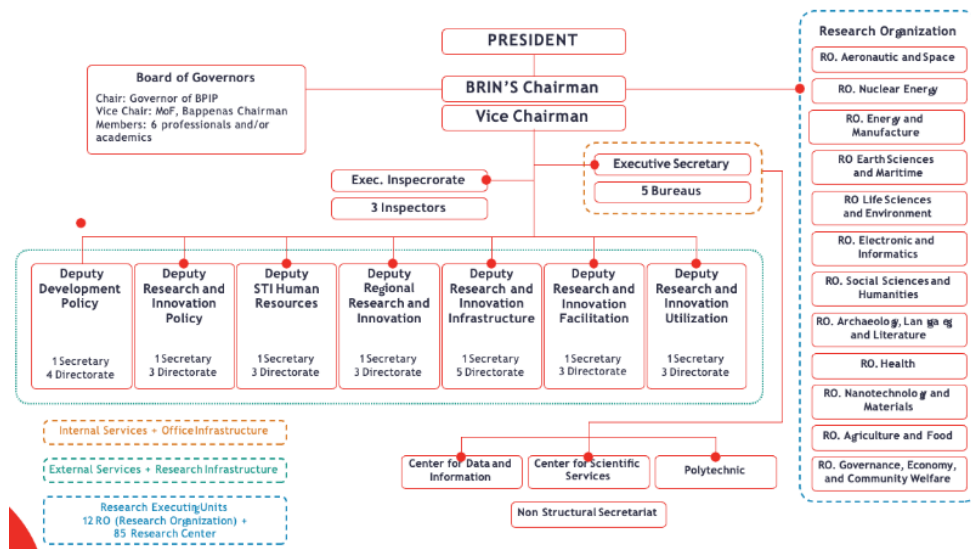| Theme	Subtheme
E-Resources	Type e-resources
	Example of e-resources
	Method for e-resources access
E-resources management	Usability analysis for e-resources
	Acquisition of e-resources
	Providing access of e-resources
	Promoting e-resources

Source: Data processed (2023)

3. RESULTS AND DISCUSSION

Profile of BRIN

The National Research and Innovation Agency (BRIN) is a non-ministerial government institution that is under and responsible to the President of Indonesia. This institution was first established by President Joko Widodo through Presidential Regulation (Perpres) Number 74 of 2019 which is attached to the Ministry of Research and Technology (Kemenristek). On April 28, 2021, through Presidential Regulation Number 33 of 2021, BRIN was separated from the Ministry of Research and Technology and stood independently under the president.

The Presidential Decree states that BRIN is a government institution that carries out research, development, study, and implementation, as well as integrated inventions and innovations. Moreover, the duties and functions of ministry/institution work units that carry out research, development, and application of science and technology are also integrated into BRIN. Therefore, all Indonesian national research agencies such as the Indonesian Institute of Sciences (LIPI), the Agency for the Assessment and Application of Technology (BPPT), the

National Nuclear Energy Agency (BATAN), and the National Institute of Aeronautics and Space (LAPAN) were then integrated into BRIN.

A total of 3621 transitional human resource researchers from ministries and institutions have officially joined BRIN. BRIN's human resources are spread across BRIN offices in several cities throughout Indonesia. This situation shows the challenge of fulfilling the same right to access information to BRIN human resources throughout Indonesia.
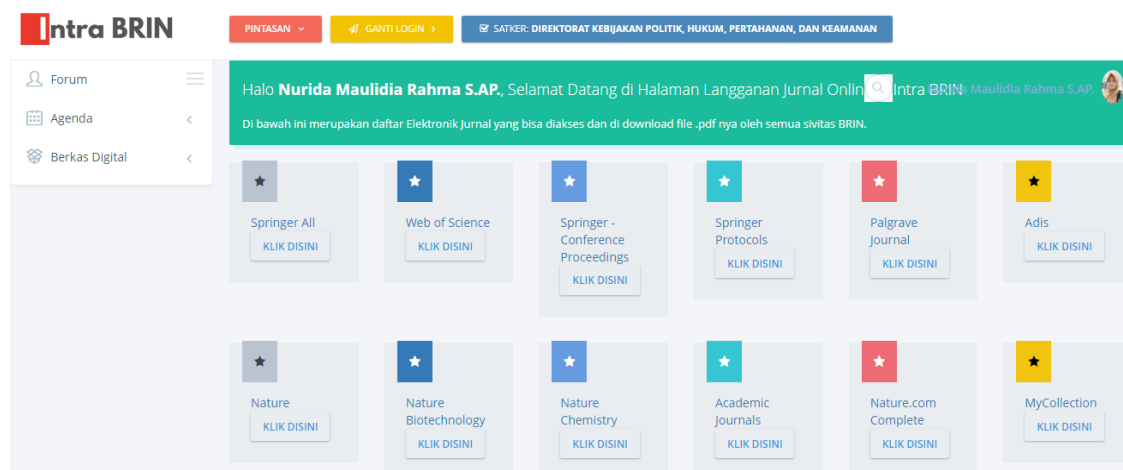

Figure 1. BRIN Organization Structure (Source: BRIN, 2023)

E-Resources on BRIN Library

BRIN has e-resources that are managed and developed for BRIN researchers. BRIN's e-resources are divided into two categories, namely internal and external e-resources. Internal e-resources cover Repositori Ilmiah Nasional (RIN), SLIMS catalog, and books published by BRIN Publisher. Meanwhile, external e-resources are databases subscribed by BRIN such as Elsevier, IEEE, Emerald, ACS, ASMEE, Scopus, dan Proquest. Internal e-resources comprise digital library, Online Public Access Catalog (OPAC). External e-resources such as e-journals, e-books, full-text (aggregated) databases, indexing and abstracting databases (Johnson et al., 2012; Mutula & Ojedokun, 2008 in Shidi & Uganneya, 2014).

BRIN researchers can access external e-resources (e-resources) via BRIN single sign-on (SSO) on the BRIN site page https://sso.brin.go.id/. SSO will lead to the dashboard intra.brin.go.id. Researchers can select and click online journals. There are various e-resources subscribed to by BRIN (See Figure 2). Online journal access can be done when working from home and working from the office. E-resources make it easier for users because they can be accessed remotely (remote access), anywhere, and at any time with an internet connection and can be accessed together (multiple access) (Pramudyo, 2023).

Figure 2. Dashboard of E-resources BRIN (Source: Documentation results, 2023)

E-Resource Management in BRIN Library

Management of BRIN e-resources involves various divisions at BRIN. Those involved in management include the Executive Secretary, Science and Technology Area (KST) BJ Habibie in Serpong, the Directorate of Repositories, Multimedia and Scientific Publishing (RMPI Directorate), and Center for data and information (Pusdatin).

1. The Executive Secretary is responsible for acquiring e-resources.
2. RMPI Directorate is responsible for managing and developing internal e-resources.
3. KST BJ Habibie is responsible for analyzing the e-resource's usability, starting with use, monitoring, and evaluation, providing recommendations for e-resources that should be subscribed to, and performing promotions to researchers.
4. Pusdatin is responsible for developing systems that support access and management of e-resources.

All divisions are involved in implementing BRIN e-resources management. The e-resource management process is as follows.

Analysis of the Usability of E-Resources

The analysis was performed by the KST BJ Habibie Division. The division compares usage data obtained from each vendor, for instance, Scopus or Elsevier Group. Each database provider has its own statistics. The data will be processed using the R statistical application and the Tableau visualization application.

Usage data was analyzed using bibliometric methods and survey methods. The survey method is carried out by distributing questionnaires and open questions periodically to BRIN researchers. The questionnaire results also showed that there was one journal that was not used. "Indeed, there are interesting things, there are also journals that, as long as they are subscribed, no one can access, you know (Interview with Dewi on 20 October 2023)".

Regarding the practice of analyzing data use, the informant said:

"We look for the Scopus ID for researchers. We analyze their thousands of reference data. What do many of their reference sources actually use? Does it match what BRIN subscribes to? Is there any connection with the e-resources subscribed by BRIN? That's new there. It will take the form of a recommendation so it is hoped that BRIN will subscribe to the next e-journals in the future. E-resources will be based on recommendations from analysis results from library friends," (Interview with Dewi on 20 October 2023).

Librarian search for the Scopus ID of BRIN researchers. Then analyze the reference sources that are frequently used, and whether they are following the e-resources subscribed to by BRIN. The results of the analysis are used to provide recommendations for journals that will be subscribed to next.

Acquisition of E-resources

The acquisition was implemented in 2021 when BRIN was born. The acquisition is carried out by the BRIN Executive Secretary. The acquisition considers recommendations from the usability analysis of BJ Habibie's KST division. Procurement is carried out by purchasing a database package (premium-platinum package) from the vendor. This package usually contains a list of several journals. Some journal providers provide trial databases, usually accessible for one month.

By the informant's statement as follows.

"This package includes this journal, so you can't choose that, bro.., sometimes what you subscribe to may not be needed or hasn't been socialized enough. But some weren't used at that time. "That's why, for example, if we don't subscribe to that one even though it's a package, we can't do that or we can't," (Interview with Dewi on 20 October 2023).

The e-resources package subscribed to is in the form of a journal package. So if the division proposes one journal database, this is not possible. The solution is to subscribe to a more complete package.

Furthermore, regarding budget provision, there is already a priority regarding the use of e-resources compared to physical collections. This is following the informant's explanation, stated.

"The digital library is a library collection, not a physical collection that is digitized or something. We don't have a physical collection anymore, we have a slim database. Well, we don't have a policy to transfer media to all library collections. That's why the budget has been increased by e-resources. So, it's a bit different from other times. For us, it's like focusing on buying journals online. But not physically because the collection also be reduced. The physical collection has been reduced a lot," (Interview with Dewi on October 20, 2023).

BRIN is starting to prioritize digital collections over print. This trend is nothing new, Lo et al. (2017) said that university libraries in Hong Kong have started a trend to focus on developing e-resource collections.

Providing Access of E-resources

Providing access performed by Pusdatin. Pusdatin provides access to e-resources via the site intra.brin.go.id (online journal). They are designed so that e-resources can be accessed remotely and multiple access. This is following the informant's explanation, as follows.

"Yes, so there are several access methods, which are determined by the journal and the Pusdatin. We can access the office first, and log in at the office using BRIN Wifi. Then when WFH they can access the house like that. Start from the office first or register using BRIN email from anywhere you can do that," (Interview with Dewi on October 20, 2023).

The obstacle faced in provisioning is database synchronization. The synchronization of subscribed e-resources does not match what is displayed on the intrabrin website (intra.brin.go.id). For instance, several databases are no longer subscribed to, but the journal shortcut/icon is still on the intrabrin website. Moreover, several new journals have been subscribed to, but have not been updated.

The integration of subscribed online journals is not compatible with the Intra BRIN homepage, this is according to the informant's explanation as follows.

> *"Intrabrin, yes, there is an e-journal, but it turns out it hasn't been updated by them and we don't know where it should go. Most requests to and requests to the Pusdatin too. It's like it's procedural again, you know. So communication is a bit difficult. In fact, it's the system because yesterday we conveyed it to the director. Yes, Mr Director at RMPI, this is a problem for us because when we socialized it to these users. So the problem is that when you click on Intrabrin it turns out that it hasn't been subscribed or it turns out that someone has subscribed but it's not yet on the Intrabrin dashboard, like that. "That's a communication problem," (Interview with Dewi on 20 October 2023).*

Promotion of E-resources

Promotion performed by every library owned by BRIN including KST BJ Habibie division. The promotion takes the form of socialization and training which is held in a scheduled and unscheduled manner. Unscheduled means that it is under the requests of each BRIN division. For instance, the Nuclear Energy Research Organization requests for their socialization. Their division will create a team to organize e-resources training.

Scheduled activities are carried out every year which aim to refresh researchers on how to access and search databases subscribed to by BRIN. Trainers come from their division, with material provided for 1-2 hours. This is following what was conveyed by the informant, he explained.

> *"Usually we first disseminate information to researchers regularly or sometimes the research center asks us to attend. So there are two, sometimes we pick up the ball, and sometimes they ask to. In Serpong, we do this regularly for up to a year, maybe several times. We went around because we happened to be in the same place. So, even though the location is far away, it is still in one place at KST BJ Habibie. So sometimes we look at the research center's agenda, when we can come or what will be done. "For instance, the nuclear energy research organization invited librarians to share resources and bibliometric analysis," (Interview with Dewi on 20 October 2023).*

Providing material is not limited to the use of e-resources, as well as bibliometric services to researchers. This becomes one package, namely e-resource services and BRIN bibliometric analysis.

The e-resources managed by BRIN are divided into internal and external e-resources. Internal e-resources include institutional repositories (digital libraries), online public access catalogs (OPAC), and online publishing. Meanwhile, external resources include online databases (e-books, e-journals, full-text databases, indexing and abstracting databases) subscribed to by BRIN. E-resources can be accessed offline via the internet (remote and multiple access).
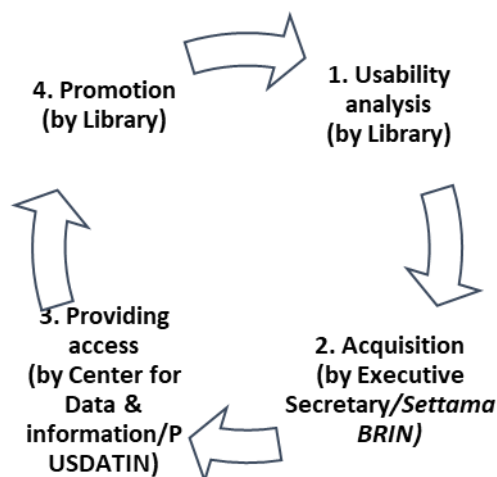
The involvement of all parties (librarians) and stakeholders in BRIN (Executive Secretary/secretary, and Pusdatin) will facilitate e-resources management. It is reflected in BRIN's e-resources management process which has set the respective boundaries and main tasks and functions for management. At least the library needs to have a team containing the following members.

a. The e-resources division is tasked with procuring e-resources including finding the right vendor.

b. The development, management and service division, is tasked with managing, developing and conducting usability analysis, as well as providing e-resources

c. The information technology division develops systems that support e-resources such as providing access to e-resources, designing a single portal search system, or creating a landing page that contains a database link that the library subscribes to.

BRIN's e-resources management practice initiated the "BRIN ERM Model". BRIN ERM Model started from the usability analysis, acquisition, providing access, and promotion of e-resources (See Figure 3). This model was designed according to the themes that emerged in the research.
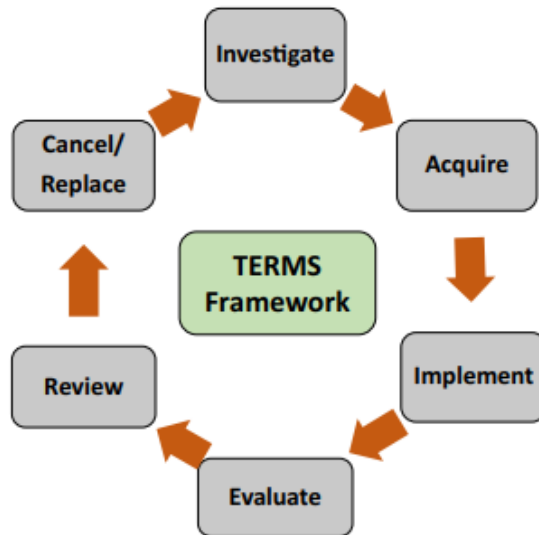
a. Usability analysis aims to see statistics on the use of e-resources used by researchers. The technique for analyzing usability is conducting surveys with questionnaires and open questions. The survey was processed using the R statistical application and the Tableau visualization application. The results are statistics on e-resources that are frequently used by researchers, e-resources that are rarely used by researchers and new e-resources that are used but not subscribed to.

b. Acquisition is performed by considering the results of the usability analysis. Several journal/ebook databases that are not subscribed to can be used as a reference for the e-resource procurement process.

c. Providing access aims to give researchers remote and multiple access to e-resources. In addition, it provides centralized access through one search portal.

d. Promotion is an activity to socialize and train e-resources for researchers. Activities are carried out on a scheduled and unscheduled manner. Scheduled means it is performed once a year to refresh how researchers can access and search subscribed databases. Unscheduled means according to the request of each research group. If assistance is needed, outreach and training activities can be carried out. This activity can be carried out by a librarian with a duration of 1-2 hours providing material and practice.
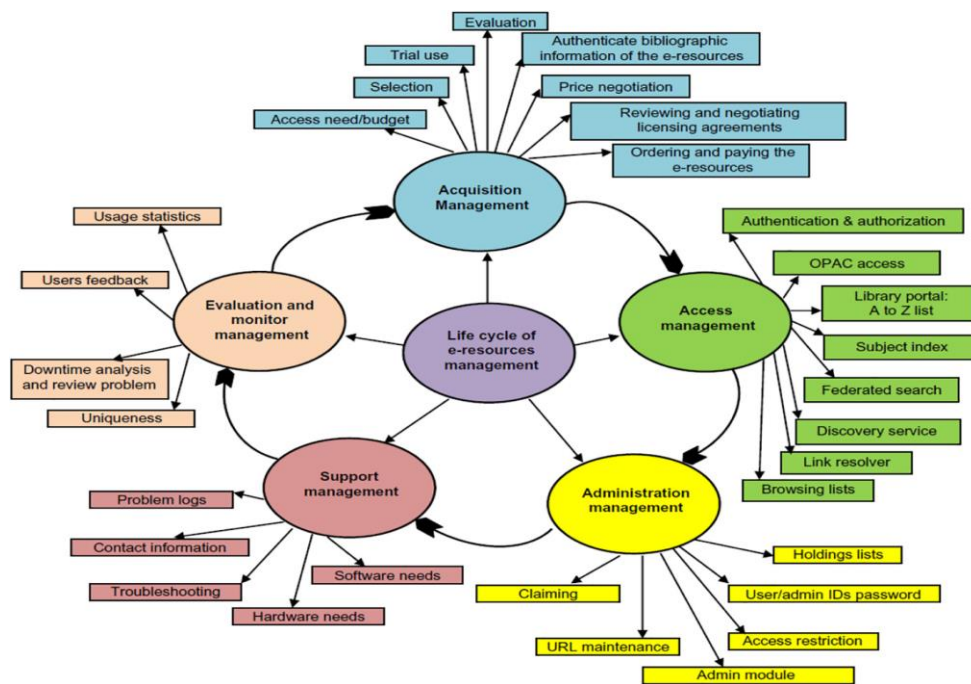

Figure 3. BRIN ERM Model (source: data processed, 2023)

E-resources management can follow the e-resources management lifecycle (ER Lifecycle). ER Lifecycle is used to solve inconsistencies in e-resource management practices (Bentil et al, 2020). Popular ER Life Cycles include the Techniques of Electronic Resource Management (TERMS) framework (See Figure 4) and the Life Cycle of ERM systems (Patra ERM Life Cycle) (See Figure 5).

Figure 4. TERMS Framework (source: Emery & Stone (2013a,b) in Bentil et al, 2020)

Figure 5. Patra ERM Life Cycle (source: Patra (2017) in Gul & Bano (2019)

Following Figures 4 and 5, the TERMS Framework and Patra ERM Life Cycle can be compared with the BRIN ERM Model (See Table 2). Comparison of each model element follows the BRIN ERM Model as a source. Patra ERM Life Cycle and TERMS Framework are used as targets.

Table 2. Comparison ERM Model: BRIN ERM Model, Patra ERM Life Cycle, and TERMS Framework

TERMS Framework	BRIN ERM Model	Patra ERM Life Cycle
1. Investigate	1. Usability analysis (Library) 2. Acquisition (Executive Secretary)	5. Evaluation and monitor management
2. Acquire		1. Acquisition management
3. Implementation	3. Providing access (Center for Data & information/PUSDATIN) 4. Promotion (Library)	2. Access management 3. Administration management 4. Support management
4. Evaluate	1. Usability analysis (Library)	5. Evaluation and monitor management
5. Review	-	5. Evaluation and monitor management
6. Cancel/replace	-	1. Acquisition management

Source: Data processed (2023)

BRIN ERM Model that applied in BRIN is similar to the Patra ERM Life Cycle and TERMS Framework. ER Lifecycle differences are possible due to the separation of duties and responsibilities of each division. Furthermore, the BRIN ERM Model that was designed in the study can be adopted by special libraries and universities in Indonesia.

Several obstacles arise in managing e-resources, such as a lack of communication between divisions, causing several problems. For instance, the homepage of an online journal which contains subscribed and unsubscribed database links is not in sync. Researchers may click on links that are no longer subscribed to, and not even be aware of the new database being subscribed to. Libraries need to organize additional resources and time to address these issues.

4. CONCLUSION

The administration of electronic resources (e-resources) at the BRIN has given rise to a novel BRIN Electronic Resource Management (ERM) system model, which holds potential applicability in specialized libraries and academic institutions across Indonesia. The genesis of the BRIN ERM Model emanates from the practical nuances of managing e-resources within the BRIN framework. A comparative analysis among the BRIN ERM Model, the TERM Framework, and the Patra ERM Life Cycle reveals noteworthy congruities in various stages, albeit not universally. The initiation of the BRIN ERM Model encompasses phases encompassing the analysis of e-resource utilization, procurement, provisioning, and promotional activities. To fortify its e-resources management endeavors, BRIN finds it imperative to adopt ERMS Software such as CORAL or FOLIO and to assemble a proficient team dedicated to augmenting e-resources management. Noteworthy is the acknowledgment that the present study is confined by the limited number of informants and unexplored subdomains within the research scope. Future investigations could delve into the viability and efficacy of implementing the BRIN ERMS lifecycle model across diverse library settings in Indonesia.

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