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BIG DATA AND ITS BENEFITS AT MUHAMMADIYAH UNIVERSITY OF SOUTH TAPANULI

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Abstract
Information is now a valuable asset that changes the pattern of life in carrying out activities. After the existence of information technology, many impacts have been felt, one of which is the method of obtaining information from large data sets. Large data sets are known as "big data". Libraries use big data to store, organize and analyze information. The use of big data has a significant impact in the library world, especially in terms of advancing and developing the library. This encourages librarians to learn how to process, analyze, and present data to support knowledge formation. This article aims to provide an overview of Big Data and its benefits in the library of Universitas Muhammadiyah Tapanuli Selatan. This research method uses a qualitative descriptive method with a descriptive research type and literature study. It is hoped that this article can provide insight for libraries to utilize the potential of Big Data. By utilizing big data, the UMTS library can analyze user needs more precisely, so that it can provide collections and services that are more in line with student interests and needs. In addition, the use of big data also enables continuous evaluation of library performance, for further improvement and development in the future

Keywords: *Big Data, Library, Universitas Muhammadiyah Tapanuli Selatan.*

INTRODUCTION

Technology is now an important element in all aspects of human life. The advancement of information technology in line with the development of science is the main foundation in all fields. The main focus of utilizing information technology is to simplify the data management process such as data management in libraries. Libraries are increasingly innovating by utilizing information technology to maximize services to library members. Libraries, as information centers must adapt and accommodate the growth of data, resources, and provide data.

The utilization of information technology in the library domain involves the management of huge amounts of data, such as member, visit, collection, and circulation information. When the volume of data is huge, the variety is varied, and the changes are rapid, the situation can be broken down into big data. (Dewi, 2020). Experts say that big data plays an important role in the progress of libraries. Golub and Hansson (2017) stated that research related to big data in libraries offers great opportunities for academics to improve libraries, especially in meeting the need for more open access to information for the community. There is still much research that can be explored. The application of big data in libraries helps understand library usage patterns so that the services provided can be more appropriate. The

big data era challenges libraries to provide data and information for better service development. (Anna & Mannan, 2020).

Big Data technology realizes handling massive data, connecting proprietary data, uncovering patterns in real-time, predicting outcomes, and applying dynamic risk assessment. Librarians and libraries agree to work with big data because libraries historically have been stewards of records and advocates of changing times, including big data. In the complex environment of educational libraries, Big Data technologies and statistics yield potential new insights from previously unmanageable data, akin to looking for a "needle in a haystack". Librarians must grasp the opportunities and challenges of this big data, and use that knowledge to guide users to choose appropriate tools. (Al-Barashdi & Al-Karousi, 2019).

One of the major innovations brought about by Big Data in libraries is the transformation of the way information is managed. The use of Big Data allows libraries to make more informed decisions based on in-depth analysis of book borrowing patterns, reader preferences, and frequent reads. This allows libraries to provide more personalized services, curate more relevant collections, and plan programs and events that better match users' interests.

The issue of big data in libraries has been widely discussed. Since the widespread use of Big Data technology in Indonesia around 2013. Some research on big data is research by Athanasia Octaviani Puspita Dewi entitled "Big Data in Libraries by Utilizing Data Mining" (Athanasia, 2020). The second research conducted by Nove entitled "Utilization of Big Data at the Air Langga University Library" (Nova, 2020). The third research conducted by Khusnul and Husniyati entitled managing library big data with data mining techniques (Khusnul, 2020). In this study, it discusses big data and its benefits at the South Tapanuli Muhammadiyah University library.

Given the enormous benefits that advances in Big Data technologies can bring, particularly in the context of libraries, it is important to look at the extent to which these technologies have been used by some libraries and highlight the challenges that arise in their implementation. The level of adoption of Big Data technologies within an institution can be reflected by the various functions that have been integrated within its IT infrastructure, enabling the execution of tasks related to mobile, social and analytical applications of Big Data.

This research provides an in-depth insight into big data and its utilization in the library of Universitas Muhammadiyah Tapanuli Selatan and is expected to provide information about Big Data in Indonesia, especially in the context of its use in libraries, towards wider utilization. The utilization of information technology in the library field is expected to improve library services, both in quality and quantity. The purpose of this research is to add insight, especially librarians, regarding the utilization of big data in libraries. This research has an impact on service development at the Muhammadiyah University of South Tapanuli library.

RESEARCH METHOD

Descriptive qualitative research method with observation, interview and documentation stages. There are two types of research, namely descriptive and literature study. This type of research is descriptive, namely research that describes information data based on facts obtained in the field (Gunawan, 2013) and this type of research is a literature study based on previous literature. There are two sources of data in this research, namely primary sources and secondary sources. Primary data sources are data sources that directly provide data to data collectors while secondary data sources are sources that do not directly provide data to data

collectors, for example through other people or through documents. Primary sources such as observations and interviews. Secondary sources such as journal articles, books and websites (Sugiyono, 2018). Informants in this study came from primary data, namely librarians of Universitas Muhammadiyah Tapanuli Selatan in the library service section in the library who usually manage data-based services.

The data analysis used in this research is to use descriptive analysis, the purpose of this analysis is to describe factually accurate and systematic, regarding the facts and relationships between the phenomena to be studied. In this study using data analysis, namely data reduction, data display and conclusions (Sugiyono, 2013). The analysis is carried out after the data required in this study are collected. Data obtained regarding big data in the library.

RESULT AND DISCUSSION

Triggers for The Development of Big Data

According to Hilbert and Lopez (2011) there are three main things that trigger the development of Big Data technology:

1) The rapid increase in data storage capacity.
2) The rapid increase in the capabilities of data processing machines. Along with the rapid development of hardware technology, the computing capacity of computer machines/devices has also increased very sharply.
3) Abundant data availability. Companies from various sectors in the United States have at least 100 terabytes of data. In fact, many of these companies have more than 1 petabyte of data (Maryanto, 2017).

Big data is a concept that includes systems that are able to collect trillions of information from a variety of billions of different sources, and then identify useful patterns in that information (Irhamni, 2015). It includes ensemble data that continues to grow every day in very large volumes, when processed, generating information as well as knowledge. The information generated from big data analysis can vary greatly depending on the processing technique or mining method. Big Data is a phenomenon that arises because of the breadth of information flows that continue to flow.

There are five characteristics of big data, namely Volume (size), velocity (speed), Variety (variation), value (value), and veracity (Truth) (Awan and Sargodha, 2017). Recording book lending data in libraries can be considered big data because it meets three main criteria: volume, speed, and diversity. The very diverse and large data in the library can be processed to produce useful information for managers in decision-making to improve the quality of library services (Khotimah, 2020).

Data managers in libraries must be able to sort and choose which data is called big data, then determine what kind of processing techniques for the big data they have, so that later they can decide on policies or provide policy input related to the results of data mining processing from the big data produced. Proper big data processing can provide new information to increase the value of data stored in library databases.

Along with the development of Big Data technology in Indonesia since around 2010, issues surrounding the use of this technology in various sectors, including libraries, are increasingly becoming the main discussion. The presence of Big Data has encouraged the private sector to optimize this technology to grow their businesses. In the context of libraries, major challenges arise in terms of organizational structure as well as internal data that includes

electronic and print collections. One of the main focuses is to update the librarian role with specific skills that are appropriate for this change (Endaryono, 2021).

Benefits of Big Data in UMTS Library

As an information center, it is clearly important for libraries to have data storage tools that can be used to provide better services to users. Libraries, which play a role as a place to store and access information, of course, need adequate data storage facilities in order to provide excellent library services for their users. Given its function as a data and knowledge center, the existence of information storage devices in libraries is very necessary to support the provision of higher quality library services to library service users.

The concept of big data that has been explained in the theoretical foundation includes three main characteristics, namely volume, velocity, and variety. Data can be categorized as big data if it is very large, created in a fast time, and has diversity. One example of big data in libraries is borrowing data, where the number of borrowers every day is very large. Volume explains why this borrowing data can be called large, while velocity indicates that it is created quickly. Meanwhile, variety is seen in the diversity of information in the borrowing data, such as the borrower's name, member number, and details about the borrowed collection (for example, book title, year of publication, author, and place of publication), which reflects the third characteristic, namely variety.

Activities in the library when seen from the first visitor entering the library are the recording of visitor data, but if the visitor wants to become a member of the library, then member data is made by adding personal data to the member data storage. After becoming a member, if the user wants to borrow books, the data is stored in the borrowing data. In accordance with the rules, if borrowing, the user must return the book or collection. The process of returning the collection is also recorded in the book return data. In addition to this circulation process, there is also a collection procurement process that can certainly produce a lot of data. Data that can be classified as big data can usually be processed to produce certain information, this information can be used by the library to take an action that can benefit the library

In general, big data is usually applied to digital libraries. In the library of the University of Muhammadiyah Tapanuli Selatan (UMTS), a digital library has existed since 2020 in collaboration with PT. Six Indonesian Kubuku but the development has not existed until now. UMTS digital library digital collections can be accessed through the windows version, the android version under the name UMTS e-library library. The UMTS Library already has a digital library supported by big data technology, although its development is still limited.

One of the benefits of big data is an automatic recommendation system to provide library collection recommendations to users based on borrowing history data, preferences, and search patterns. With data mining and machine learning techniques, the system can learn user patterns and provide personalized recommendations.

Big data processing is carried out using data mining techniques. Data mining is a technique that can generate new information, based on the grouping of data selected by the manager (Khatimah, 2020). The selection of the appropriate mining technique group also needs to be considered in managing big data. Through data mining techniques, the UMTS library can find out the characteristics of borrowers, for example, book lending transaction data in the even semester of 2022/2023, there are thousands of transactions that can be processed using an algorithm, one of which is algoritma a priori used to obtain association rule. Data mining Framework It is used to find the relationship between the borrowed book data in the book

lending transaction. So that the UMTS library manager gets information to decide what steps will be taken in promoting and developing the library.

The existence of big data in the UMTS Library makes it easier tomake library decisions with more careful and data-based analysis, such as what book collections must be added to the UMTS library. The presence of Big Data in libraries is not just a change in technology, but also represents a paradigm shift in the way UMTS libraries provide services, interact with users, and utilize information to improve library quality. By utilizing big data, UMTS libraries can analyze user needs more precisely, so that they can provide collections and services that are more in line with students' interests and needs. In addition, the use of big data also allows for the evaluation of library performance on an ongoing basis, for further improvement and development in the future.

Seeing the benefits of big data in the UMTS library is influential in library development, the application of big data in libraries must be optimized. In the application of big data, there are challenges faced by librarians in the era of big data, namely challenges from the outside and challenges from within. Challenges from the outside are challenges that come from people who are experts in information and communication technology (ICT), as we know ICT experts are indeed very dominant in today's big data era. But in fact, what ICT employees do is the work of a librarian but assisted by mastery of "tools" or strong data analysis tools and skills. Therefore, librarians of the University of Muhammadiyah Tapanuli Selatan need to improve their competence in the field of information technology and data analysis in order to be able to optimize the application of big data in the library of the University of Muhammadiyah Tapanuli Selatan.

CONCLUSION

The presence of Big Data in the library is not just a change in technology, but also represents a paradigm shift in the way UMTS libraries provide services, interact with users and utilize information to improve the quality of the library. By utilizing big data, UMTS libraries can analyze user needs more precisely, so that they can provide collections and services that are more in line with students' interests and needs. In addition, the use of big data also allows for the evaluation of library performance on an ongoing basis, for further improvement and development in the future.

SUGGESTION

Librarians and IT staff need to improve their competence in the field of information technology, especially regarding big data, considering the benefits of big data are very beneficial in the scope of libraries

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