Implementation of Business Intelligence in Data and Information for Student Admission Process in Mulia University

Dedy Mirwansyah*, Riyayatsyah, Dewi Wulan Sari

Department of Information System, Mulia University Samarinda, Indonesia

*Corresponding author e-mail: dedy.m@universitasmulia.ac.id

Abstract. Mulia University is a private university that carries the slogan “Global Technopreneur Campus” with a total of 1631 students per August 2019. Mulia University has two campuses for learning support. The first one is Balikpapan Main Campus, and the other one is Samarinda Campus. The data to be used in this research is a prototype. Then, will be analyzed by Business Intelligent. Business intelligence is a series of processes to get information easily from large and complex data. In this research has been conducted two stages of analysis, which is data collection techniques and data analysis techniques on prospective student data. The application that is used in this research is Microsoft Power Business Intelligent. By using Microsoft Power Business Intelligent, it is expected to simplify the management of student admission reports, as well as decision making and to determine future strategies. The results of this research are data visualization information reports about student admission.

1. Introduction

The development of education and information technology has made the competition for private-based business activists increasingly tight. Information technology is also one aspect that makes educational institutions have a competitive advantage[1]. Mulia University is a private College that carries slogan the “Global Technopreneur Campus” with the Number of students currently 1631 students. The Amount of Student was formed from the Main Campus of Balikpapan 1226 students, and from Samarinda Campus 405 students. The information generated from data and technology is an essential factor for the development of a university.

Every new academic year, Mulia University opened registration for new student admission, and the students come from a variety of high school / vocational school and also from different regions. The Mulia University information can be reached from various information sources such as websites, social media, brochures, banners, MGM (Member Get Member) and other information. The speed of data processing and information retrieval that will be used for decision making at a university helps the university able to cope with and avoid events that can result in less than a maximum of new student admission.

Business intelligence (BI) is a series of activities to understand the business situation by conducting various types of analysis on data held by organizations as well as external data from third parties to help determine strategies, tactical business decisions, and operations and take the necessary actions to improve business performance[2]. The importance of using Business Intelligence (BI) for a university is in the process of information sources about the new student admission. For example, the origin of prospective students and the amount of data prospective new students make a university able to conduct data processing very well so that it can produce an information and appropriate decision making, including the result of data and information from a varied sources and process it into decision making, speed up operations and take the necessary actions to create a better and focused market.

The university that be the object of this research is Mulia University, where the university annually opens admission for new student with a target of 900 to 1200 students. If the goal of Mulia University is achieved, it can be imagined that the amount of data and information processed by the
student admissions committee will be considerable. The data used is prototype based on the type of information source, and how to register at Mulia University, this data consists of MGM (Member Get Member), Website, Airlangga Vocational School graduate, Brochures, Banners, and Social Media and other sources.

2. Theoretical Review
Business Intelligence (BI) is a set of theories, methodologies, processes, architecture, and technology that transform raw data into meaningful and useful information for business purposes[3][4]. Business Intelligence explains a concept and method for how to improve the quality of business decision making based on data-based systems. BI is a decision support system based on data. Business Intelligence is a way to collect, store, organize, re-form, summarize data and provide information. Either in the form of data on the company's internal business activities, as well as data on the company's external business activities including business activities of competitors that are easily accessed and analyzed for various management activities. The information generated is one of the essential assets that are very valuable for the survival of an organization/business, security and integration of the country, public or consumer trust, so it must be maintained following the accuracy, completeness, and combination of information. Information can be presented in various formats, such as text, images, audio, and video. Management information must be relevant in negotiations with the credibility and struggle of many people's lives. The purpose of managing data is to protect the confidentiality, integration, and preservation of that information [5], to apply Business Intelligence in this study using the Microsoft Power Business Intelligence application.

Microsoft Power BI can visualize data that you have entered or data that has been connected by a third system. You can also control and monitor your data easily. Microsoft Power BI carries 3 work concepts that will greatly assist you in analyzing data such as Dashboard, Report, and Datasets. Datasets are assembled data that has been imported or connected to Power BI. Then, Report is one or more pages of visualization. Reports can be in the form of charts or graphs. And the last one, the Dashboard itself, Dashboard is an integration display, that displays a set of reports from a set of datasets. The dashboard provides data information, analysis, and provides an overview in the form of single dashboard visualization [6].

Data Visualization is a technique of presenting data visually through graphs, charts, maps so that the display is interesting but still informative. Data visualization is seen in many fields of science as modern visual communication. The main purpose of data visualization is to communicate information clearly and efficiently to users through the selected information graphs, such as tables and graphs [7]. Data visualization is a way (perhaps a solution) to communicate abstract data, to aid in data understanding by leveraging human visual system[8][9].

3. Method
There are two stages in this research, namely:

3.1. Data Collection Techniques
The method used in this data collection is the study of documents as a based for making prototypes. Document study is a data collection method that requires documents directly related to research that can be used for data analysis. The materials that be used in this research are prototype data of Mulia University prospective students, sources of student admission information, regional origin, school origin, age, gender, occupation, number of who have re-registered and have not re-registered, and a description of selected study programs, based on from MGM (Member Get Member), Website, Airlangga Vocational School Alumni, Brochures, Banners and Social Media and other sources.

3.2. Data Analysis Techniques
After the data is collected and prototyped, then the data is ready to be analyzed. When analyzing the data, we use the Microsoft Power BI application, which later the raw data that we enter will be directly analyzed to produce a visualization of student admission data so that it will help in determining decisions and strategies in capturing new students.
4. Results and Discussion

4.1 Data
The data processed in this research formed in the form of a list of prospective students, sources of information, regional origin, school origin, age, gender, occupation, the number of those who re-registered and had not re-registered, and the description of the chosen study program. In this study, the data used is a prototype.

4.2 Data Processing
Data is processed using Microsoft Power Business Intelligent, with the following steps:

a. Input/read data to be processed, the data must be in Excel data.
b. To start the data processing, datasets are imported or connected to Power BI.
c. Select the desired visualization to make a report in the form of data visualization, then the integration display dashboard that displays a set of reports from a set of datasets. The dashboard provides data information, analysis, and provides an overview in the form of single dashboard visualization.

The results of this data process will be in the form of visual data, from the visual data it can be seen all information on the new student admission of Mulia University.

Excel data processing that has been connected to Power BI in the form of datasets

![Figure 1. Results from import datasets](image-url)
The Mulia University student admission information dashboard is a collection of visual data reports containing information on the number of prospective students, sources of student admission information, origin, school origin, age, gender, activity or occupation, number of accepted and rejected, and selected study program information.

Figure 2. Information Dashboard for Mulia University Student Recipients

Display information if only requires student admission information sourced on the website.

Figure 3. Source Information Display
Information display of prospective students is based on the regional origin, which is in Figure 4 is the PPU region highlighted so that information about prospective students from PPU can be known in one view.

![Figure 4. Information based on regional origin](image)

Display the registration status of prospective students, information if they have not pre-registered

![Figure 5. Registration status information](image)
5. Conclusion
Based on the overall results of the research that has been done, it is concluded that the system that has been produced from this research shows that the use of BI technology is not only for companies but also supports in the educational field, especially for the strategy of students admission. Visualization of information through graphics is more interactive and exciting so that it will be easier to read data, otherwise the print out results (Hardcopy) will be documentation for management. The information generated from the system is not only for policy-making tools, but also can be used as consideration for decision-makers.

Mulia University can find out the source of information for the majority of prospective students, and the committee can easily display data in real-time to policyholders. With better data and information, it is expected that decision making will be better [10].

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