

IMPLEMENTATION OF DASHBOARD POWER BI FOR DATA VISUALIZATION OF GRADUATES DURING COVID-19 PANDEMIC IN THE FACULTY OF TARBIYAH AND TEACHING SCIENCES IAIN PALOPO

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Abstract--This study presents information regarding the distribution of graduates and the number of students who graduated during the pandemic of Covid-19 at the Faculty of Tarbiyah and Teaching Sciences IAIN Palopo through visualization of data depicted during the Covid-19 pandemic, namely in a vulnerable time in 2020 to early 2022. This visualization is done by distributing graduate data into the Microsoft Power BI application and depicted in the form of a diagram, after that the data is visualized in the form of diagrams and numbers based on the categories that have been collected in the form of an Excel file which is then saved in a CSV file type so that the files obtained lighter than before so that the distribution of data in the form of information for graduates of the Faculty of Tarbiyah and Teaching Sciences at IAIN Palopo can be easily observed by policymakers in making decisions.

Keywords: Data Visualization, Dashboard, Covid-19, Microsoft Power BI

I. INTRODUCTION

Coronavirus Disease-19, known as Covid-19 pandemic, and it has become a health threat all over the world since it has spread throughout the world. The World Health Organization (WHO) considered the spread of the coronavirus as a pandemic on March 2, 2020. According to the data the number

of Covid-19 case in Indonesia year 2022 is as follows; the number of positive case is 6,244,978, the number of cure is 6,037,738, while the number of deaths due to Covid-19 is 157,095 people. The DKI Jakarta occupies the first position with the number of case is 1,330,836, or about 21.4 percent of the total. In comparison, East Kalimantan occupies the lowest position, with the number of case of 207,186 or about 3.3 percent of the total active cases in Indonesia [1]. The existence of a vaccine which is a solution to minimize the spread of the Covid-19 virus is not yet fully effective. According to the data from the Ministry of Health of the Republic of Indonesia; the positive rate is in the range of 9.1 percent, the Case Fatality Rate is 2.52 percent, while the Recovery Rate is 96.7 percent [2]. Several health experts stated that vaccine is not the only one to minimize the spread of Covid-19 but complying with health protocols is other way to minimize the spread of Covid-19, and it is already quite effective in providing a level of protection [3].

The use of technology in analyzing and visualizing data has grown significantly. One of them is by using Microsoft Power Business

Intelligence (BI). Microsoft Power BI is a data visualization application software developed by a large United States company engaged in Information technology, namely Microsoft. Power BI (Business Intelligence) is a cloud-based data analysis, which can be used for data analysis and reporting. Power BI is user-friendly and straightforward. Power BI is mature and robust that BI developers can use in enterprise systems for complex data modeling and merging scenarios [4]. Power BI itself is also widely used by several companies as a tool for financial system analysis and it is used to make decision in a company. Power BI, from Microsoft, is a suite of business analytics tools used to analyze data and share insights in the form of reports and dashboards. User data in various documents – spreadsheets, text files, databases, etc. form can be the input for Power BI. Datasets are formed by transforming the data provided by the users. Once a dataset is ready, reports can be created by adding multiple visualization elements. Visualization elements in Power BI is ranging from showing a single number to a gradient-colored map. These visuals help presenting the data in a way that provides context and insights. Business Intelligence explains concepts and methods to improve quality in business decision-making based on a data-driven system, which has been improving in visualization form. The strength of cloud BI applications is that it is accessible on multiple devices and web browsers, therefore it is indirectly improving organizational performance and enhancing the decision-making process. Working with BI in the cloud is an economical alternative to actual software purchases. The responsibility for IT assets, their installation, and maintenance are borne by the provider.

Power BI is a collection of software services, applications, and connectors that has the ability to work together to turn multiple unrelated data sources into coherent, visually immersive, and has interactive insights. Your data may be in any forms: Excel spreadsheets, Access or SQL Server databases or hybrid repositories, and hybrid data repository sets. Power BI allows you to connect to data sources, view easily and also discover what matters most, and share with whomever or whomever you want [5]. Microsoft Power BI is a

software tool that is very easy to use with several tools that have been provided in it; users can explore several items, either to analyze reports in real-time or also visualize data that is very interesting so that statements are made using databases, excel and spreadsheets. Business Intelligence explains the concepts and methods of how to improve the quality of business decision-making based on data-driven systems decision-making. The tools used are Microsoft Power BI. Microsoft Power BI assists the process of doing analysis, reporting, forecasting, and data visualization into a dashboard display [6]. As with data visualization in general, Power BI can also be used as an engine for decision-making. Microsoft Power BI offers two extensibility frameworks that can be adopted to extend the platform's functionality: "visuals," which can be used in conjunction with native visual representations such as bar charts, lines, and graphs. And circles and "solution templates" that automate data access, processing, and presentation in data for applications running on the Microsoft [7].

The power BI app is an essential component on the user side where to view and access the *dashboard* through multiple apps like Power Apps [8]. Power BI connector is leading an essential role in getting data from databases and other sources using connector apps like database engine, Azure Consumption Insight Connector...etc. [9]. Typical Microsoft Power BI operations are as follows: 1) Get Data from Required Data Sources 2) Analyze data via organizational connectors and gateways 3) Generate Reports via Visuals and Different Filters 4) Publish Reports to the web via Power BI Desktop 5) Edit reports if any changes are needed and make can be shared by publishing options to web to create embed URL 6) Access report data from various Microsoft applications like Power Apps, Mobile Power BI 7) Refresh data using different Organization gateway to update *dashboard* [10]. This paper discusses the process model and visualization of Power BI tools and interactive data visualization techniques for the analysis and design of data visualization of

educational institutions using Microsoft Power BI tools.

II. METHOD

This research was carried out by collecting data from the IAIN Palopo database, which contained the number of graduate of Faculty of Tarbiyah and Teaching Sciences at IAIN Palopo during 2021-2022, where the data consisted of 7 Study Programs. These are Islamic Education Management (MPI), Mathematic Education (MTK), Islamic Religious Education (PAI), Arabic Language Education (PBA), English Language Education (PBI), Madrasah Ibtidaiyya Teacher Education (PGMI), and Early Childhood Islamic Education (PIAUD).

The experimental stage is as follows:

1. Collecting data.
 This stage was carried out by collecting data from students who graduated from the IAIN Palopo database in excel form.
2. Preprocessing data.
 This stage was carried out to remove unnecessary data and improve the data structure so it might be appropriately processed.
3. Data visualization using *Microsoft Power BI*.
 The data visualization stage was carried out after the data was processed through *Microsoft Power BI*, where the data presented output in the form of visualization of informational data history of each study program in the 2021-2022.
4. Data analysis.
 The Analysis Stage was the analysis stage of data visualization in the form of graphs to conclude information on graduates and graduates during Covid-19 on 2020-2022.

III. RESULT AND DISCUSSION

A. Data Collection

Data on the distribution of Faculty Graduates consisting of seven study programs were then collected in the form of an excel file in the format of CSV, which can be seen in Fig. 1.

	A	B	C	D	E
1	NIM	Nama	Jenis Keluar	Tanggal Keluar	Semester Keluar
2	15 0206 0026	REVIYANTI TONI	1	22/09/2020	2020
3	16 0206 0053	Nurhidayah	1	22/09/2020	2020
4	15 0206 0009	HASRIANI	1	22/09/2020	2020
5	15 0206 0008	ANGGUN SETIAWATI	1	22/09/2020	2020
6	16 0206 0074	Hasriyani	1	22/09/2020	2020
7	15 0206 0042	NARMI	1	22/09/2020	2020
8	15 0206 0004	SAHNAWATI	1	22/09/2020	2020
9	16 0206 0030	Nursanti Ramadhani	1	08/02/2021	2020
10	15 0206 0024	ROSNA	1	22/09/2020	2020
11	16 0206 0015	Andi Muslinar	1	05/02/2021	2020
12	15 0206 0037	PUNISA	1	22/09/2020	2020
13	15 0206 0048	NILAN ALAN SARI	1	01/10/2020	2020
14	15 0206 0021	HISBULLAH	1	22/09/2020	2020
15	15 0206 0031	DEWI SARTIKA	1	22/09/2020	2020
16	15 0206 0019	ROSDIANA	1	22/09/2020	2020
17	15 0206 0033	DESI LESTARI	1	22/09/2020	2020
18	15 0206 0032	WIDIARTI	1	22/09/2020	2020
19	15 0206 0001	A. MUH. ADI AGUNG S	1	22/09/2020	2020
20	15 0206 0011	FIFI YUSTIKA	1	22/09/2020	2020
21	15 0206 0036	NISDA	1	22/09/2020	2020

Fig. 1. Display of spreadsheet data distribution of graduates in Faculty of Tarbiyah and Teaching Sciences IAIN Palopo

B. Data Preprocessing

The data on the distribution of graduates from the Faculty of Tarbiyah and Teaching Sciences which was collected into spreadsheet form, did not go through the *data clearing* because the data should be visualized and the spreadsheet format must be changed to CSV format, this is because the data loading process is faster since the data was created in CSV format where the data was smaller than the spreadsheet form.

C. Data Visualization

Microsoft Power BI is a tool to process data *mining, forecast analysis*, and so on. Furthermore, everything contained in the CSV file was transformed into a parent table which would be processed as the main table in creating the *dashboard*. It consisted of 7 *dashboards* that were processed in the study:

1. Data from MPI (Islamic Education Management) Study Program graduates.

This data visualization uses a pie chart diagram using different colors where each color represents

the distribution of graduates of the MPI study program. The colors represent the date, month, and year of graduation, and students that completed their studies on September 22 with a total of 42 graduates and they were all female students or approximately 26.75% of the total students in MPI. During September 23, 2020, to October 19, 2020, students that complete the study period only 1 person per week or only 0.64%, as seen in Fig. 2.

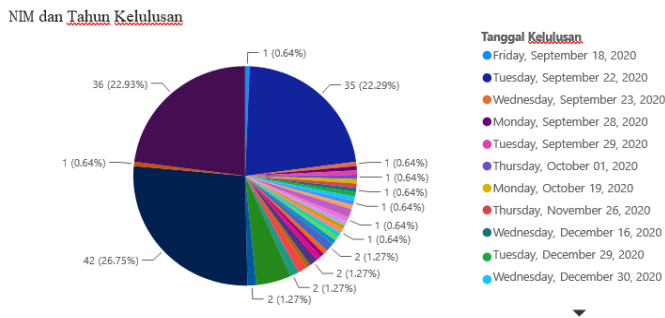


Fig. 2. Pie chart of MPI

2. Data for Mathematics Education Study Program graduates.

This data visualization uses pie chart diagrams using different colors where the colors represent the distribution of graduates from the Mathematics Education study program, where the colors represent the date, month, and year of graduation, and graduates of the Mathematics Education Program Faculty of Tarbiyah and Teaching Sciences. The students that completed their studies on October 5, 2020 were 56 students and all of them were female students or about 32.26% of the total students of the Mathematics Education study program. While students who completed the least period of study were on September 18, 2020, to December 02, 2020, and January 16, 2021, to January 27, 2021, were a total of 6 students and female students or around 3.42% of the total graduates of the Mathematics Education study program. As seen in Fig. 3.

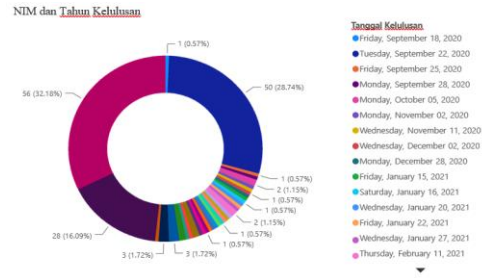


Fig. 3. Pie chart of Mathematics Education Study Program graduates

3. Data for PAI (Islamic Religion Education) Study Program graduates.

This data visualization uses a pie chart diagram using different colors where each color represents the distribution of graduates of the PAI study program, the date, month, and year of graduation and graduates of PAI study program. Students who completed their studies on February 10, 2020, were a total of 70 graduates and female students or around 33.33% of the total number of students of PAI study program. While students who completed the study period on January 21, 2020, February 11 to February 17, 2021 were a total of 4 students and female students or around 1.92% of the total graduates of the PAI study program, as seen Fig. 4.

While students who completed the study period on January 21, 2020, February 11 to February 17, 2021 were a total of 4 students and female students or around 1.92% of the total graduates of the PAI study program, as seen Fig. 4.

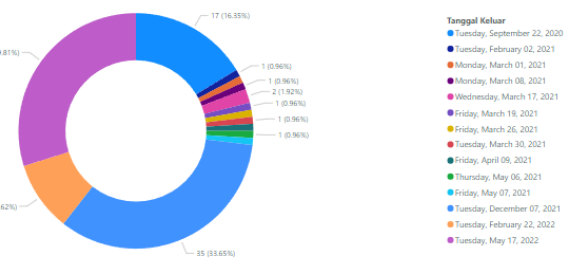


Fig. 4. Pie chart of graduates of the Islamic Education Study Program

4. Data for PBA (Arabic Language Education) Study Program graduates

Visualization of this data uses a pie chart diagram using different colors where the color represents the distribution of graduates of the Arabic Language Education study program, the date, month, and year of graduates and graduates

of PBA study program. Students who completed their studies on February 19, 2021, were a total of 22 graduates and female students or about 30.54% of the total students and students of the PBA study program. Students who completed their study from January 21, 2021, to March 22, 2021, were of 4 students and female students or about 5.56% of the total graduates of the PBA study program. As seen in the image below.

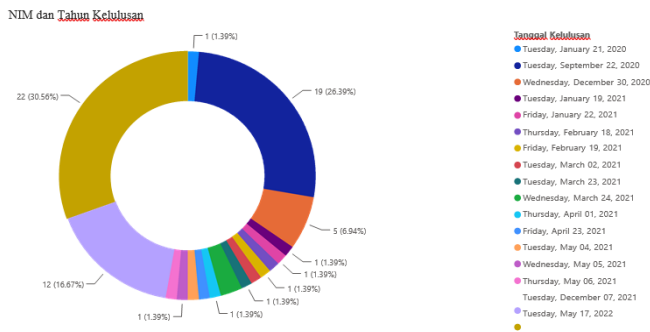


Fig. 5. Pie chart of graduates in Arabic Education

5. Data for graduates of the PBI (English Education) Study Program

Visualization of this data using pie chart diagrams using different colors where the color represents the distribution of graduates of the PBI study program, the date, month, and year of graduates and graduates of PBI study program. Students who completed their studies on November 17, 2020, were a total of 58 students and female graduates or around 24.79% of the total students of PBI study program.

While during September 23, 2020, to November 11, 2020, and November 18, 2020, to December 09, 2020, and on February 23, 2021, the students who completed the study were only a total of 8 students or around 14.4% of the total students of PBI study program. As seen in Fig. 6.

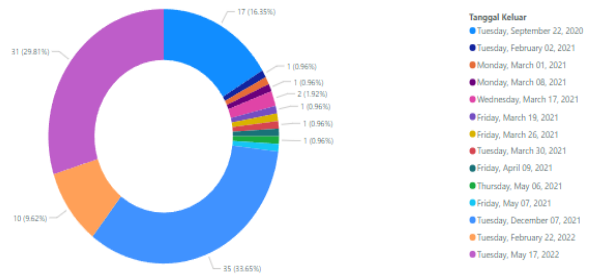


Fig. 6. Pie chart of graduates of English Education Study Program

6. Data for graduates of the PGMI (Education for Madrasah Ibtidaiyya Teachers) Study Program graduates.

Visualization of this data uses a pie chart diagram using different colors where the color represents the distribution of graduates PGMI study program, the date, month, and year of graduates of PGMI study program. Students who completed their studies on December 7, 2022, with a total of 35 students and female graduates or about 23.65% of the total students and students of the PGMI study program. During the period of on February 02, 2021, to March 30, 2021, and May 06, 2021 students that completed their studies were 5 students and female students or about 0.96% of the total graduates PGMI study program. As seen in the Fig. 7.

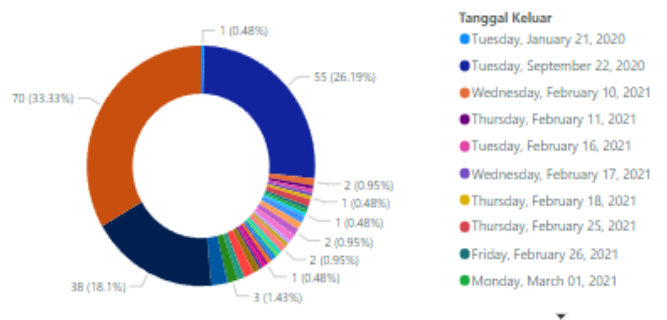


Fig. 7. Pie chart of PGMI Study Program graduates

7. Data from PIAUD (Early Childhood Islamic Education) Study Program graduates.

This data uses a pie chart diagram and uses different colors where the color represents the distribution of graduates of the Early Childhood Islamic Education study program, the graduates'

date, month, and year, and graduates of the PIAUD. Students who completed their studies on May 17, 2022 were 8 students and female students or around 32% of the total students and students of the PIAUD study program. During May 04, 2021, to May 08, 2021, and September 20 to October 28, 2021, there were only 4 students who completed their studies, and all were female students or around 16% of total graduates of PIAUD study program. As shown in Fig. 8.

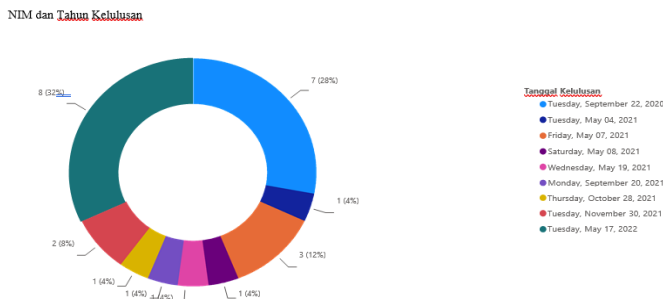


Fig. 8. Pie chart of PIAUD Study Program graduates

IV. CONCLUSION

The use of the Microsoft Power BI dashboard visualization, mapping, and data collection of graduate students and students at the Faculty of Tarbiyah and Teaching sciences of IAIN Palopo during the Covid-19 pandemic can be understood easily by looking at all the information in diagram. The diagrams are depicted using various colors that indicate the shape of the graduate, which is more interesting, making it easier to analyze and to make decisions in increasing the number of graduates at the Faculty of Tarbiyah and Teaching Sciences IAIN Palopo. The distribution of data on students and students who have graduated during the Covid-19 pandemic at the Faculty of Tarbiyah and Teaching Sciences IAIN Palopo in the form of an Excel file does not describe comprehensive data, especially in the marking of NIM and graduation date.

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