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SECP1513 – TECHNOLOGY INFORMATION SYSTEM
SECTION 02

ASSIGNMENT 4 :
DATA ANALYTICS & VISUALISATION USING MICROSOFT
POWER BI

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Data analytics is a combination of strategies for retrieving contextual information from broad and diversified quantities of data acquired from many sources and of variable sizes. Next, applications based on machine learning algorithms, simulation, and automated systems may be used in its processes and approaches, resulting in Big Data Analytics. Big Data Analytics may assist in handling data accuracy, producing valuable data, managing Big Data on a large scale, and etc. Furthermore, there are four different types of data analytics: descriptive analytics, which describes events over time, predictive analytics, which focuses on events that are expected to happen, diagnostic analytics, which focuses on the cause of the occurrence, and prescriptive analytics, which indicates a course of action. The data analytics process then consisted of four steps: defining the criteria for grouping, collecting, organising, and cleansing the data. As a result, data analytics can lead to a great data analyst, which will improve data quality and benefit both clients and financial institutions. In addition, **data visualisation** is described as a visual representation of data in the form of a chart, diagram, or graph that provides a complete understanding and may be utilised as a reporting tool. To create a proper and clear data visualisation, we must first identify and comprehend the problem and information so that the story's context may be communicated to people successfully. There are seven types of data relationships, including nominal comparison, which compares the quantitative values of subcategories, time series, which tracks changes in the values of a consistent metric over time, such as monthly sales, correlation, which consists of data with two or more variables and can be visualised as a positive or negative correlation, ranking, which compares two or more values, and deviation, which examines how data points relate to each other. We can use a variety of chart types to produce data visualisation, such as bar, pie, line, scatterplot, bubble, and heat map. You can connect to your data, alter it, and visualise it with Microsoft Power BI. Software as a Service can be used to generate and publish reports. As a result, we know that Microsoft Power BI can increase business user productivity by providing real-time access to vital data, and that data visualisation can help by delivering data in the most efficient way possible.

To solve problems with providing the updated real-time data related to vaccine and booster efficiency against Covid-19 cases in any form of report or dashboard. We use Microsoft Power BI as a set of tools and services for the team that alter navigation to make it easier for

users to access material and comprehend the relationships between reports and dashboards. Essentially, our dataset represents the amount of people who have partially, fully vaccinated including unvaccinated administered to all Malaysian citizens, as well as data on cases recovered and new cases recorded.

From there, we were able to come up with various questions to connect it to our dataset, such as :

1. Why do certain types of vaccines require boosters ?
2. Does the vaccine given to the people in Malaysia show its effectiveness by reducing the transmission of covid infection?

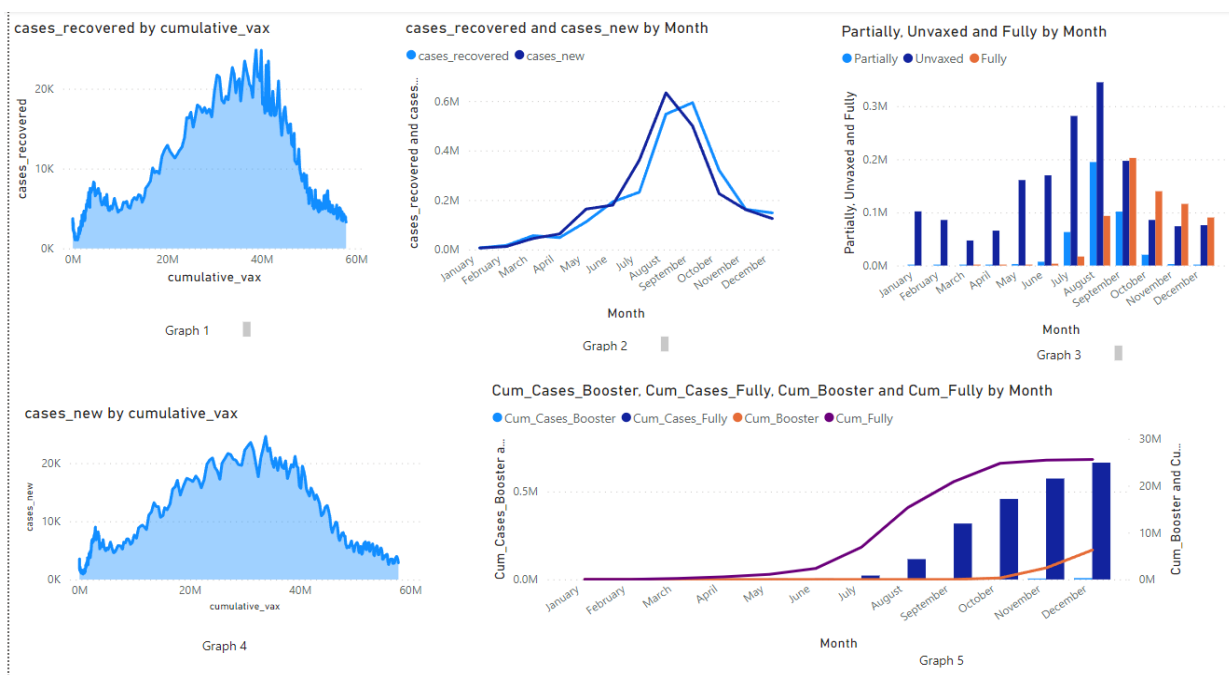


FIGURE 1 : The Data Visualisation of Covid-19 Cases and Vaccine

Firstly, Graph 1 represents Covid-19 cases recovered versus the cumulative number of people who received the vaccination, which indicates a rapid increase followed by a gradual decrease.

Next, in Graph 2, it shows the Covid-19 cases recovered and new cases by month starting from January to December 2021 where the highest cases recovered were found in early October while the highest new cases were discovered in September.

Moreover, Graph 3 consists of the total number of covid cases per month among partially vaccinated, fully vaccinated and unvaccinated people. Unvaccinated people score the highest in August followed by the second highest which is the partially vaccinated people. Additionally, fully vaccinated people increase starting from June to September and decrease significantly until December.

In Graph 4, it demonstrates the number of new Covid-19 cases by cumulative vaccine with the curve growing and then falling rapidly.

Finally, Graph 5 shows the relation between cumulative Covid-19 cases among fully vaccinated people and the total number of fully vaccinated people, with the number of cases increasing steadily throughout 2021 while the total number of fully vaccinated people increases beginning in July and plateaus in the the last two months of the year. The relationship between cumulative Covid-19 cases among booster recipients and the cumulative number of booster recipients can be seen in the same Graph, where it was first administered in October 2021 and is growing at a constant rate, whereas the number of cases among them is relatively low and constant, though increasing slightly every month.

As seen in Graph 1, the number of cases recovered has decreased significantly as the number of new cases of Covid-19 has decreased. Cases recovered the highest when the cumulative vaccine at 40 million. The value decreased significantly for cases recovered when it's past 40 million cumulative vaccines. This is because Covid-19 new cases decrease significantly due to the vaccine having shown its effectiveness. We may also deduce from Graph 5 that certain vaccines require booster shots to protect against viruses as the vaccine's efficiency declines over time. This is because there is still a chance for someone who has been fully vaccinated to be exposed to Covid-19. From the data, we can see from Graph 5, the number of cases of covid-19 infection for fully vaccinated groups increase. As a result of the data, the booster is intended to help people retain their immunity to Covid-19 for a longer period of time. Graph 5 also shows that the number of people who received booster doses began to rise substantially starting in July. As a result from this analysis, we can see that the number of new cases of Covid-19 infection reduces drastically, as shown in Graph 4.

Furthermore, in Graph 3, we can observe that the number of people who have not been vaccinated is the highest in August. Consequently, the Covid-19 new cases also is the highest in August where it makes the people start to realise the impact of vaccine's effectiveness towards

the total number of cases recovered. Due to that, the number of unvaccinated people is declining and remained constant through December. Aside from that, in Graph 2, we can observe that the number of Covid-19 new cases has been steadily decreasing since mid-August, as the total number of vaccines provided to people has increased. As a result, people who have been fully vaccinated are less likely to become infected than those who have not been fully vaccinated in 2021. In addition, these vaccines will lower the risk of illness, including infection without symptoms, and reduce the workload of frontline workers while complying with the Standard Operating Procedure (SOP) consistently in the citizens' daily life.

In conclusion, as indicated in all of the Graphs in Figure 1, we understand the necessity of vaccines and booster doses against covid-19 infection. The graph clearly demonstrates the efficacy of vaccines, as the number of new cases and active cases decrease significantly when the vaccine is introduced. The graph also shows the value of booster shots, as the number of new cases from both unvaccinated and fully vaccinated people has decreased significantly. We can conclude from these graphs that Malaysia has taken the proper steps to deal with Covid-19 cases. This analysis can also assist Malaysia or other countries in determining the best course of action to fight Covid-19 cases.