**Power BI Assignment 1**

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**Ans 1 Business Intellligence**

BI(Business Intelligence) is a set of processes, architectures, and technologies that convert raw data into meaningful information that drives profitable business actions.

It is a suite of software and services to transform data into actionable intelligence and knowledge.

BI tools perform data analysis and create reports, summaries, dashboards, maps, graphs, and charts to provide users with detailed intelligence about the nature of the business.

* BI systems help businesses to identify market trends and spot business problems that need to be addressed.
* BI technology can be used by Data analyst, IT people, business users and head of the company.
* BI system helps organization to improve visibility, productivity and fix accountability.

How business intelligence works

Here are the steps:

**Step 1**) Raw Data from corporate databases is extracted. The data could be spread across multiple systems heterogeneous systems.

**Step 2)** The data is cleaned and transformed into the data warehouse. The table can be linked, and data cubes are formed.

**Step 3)** Using BI system the user can ask quires, request ad-hoc reports or conduct any other analysis.

**Ans 2**

Microsoft Power BI is one such popular BI tool that is the leader in its field, for its economical model and extensive analytics capabilities. It’s proven to enable significant cost savings and increased productivity, with a number of high-profile international companies using the software.

1. Simple and accessible insights

You don’t have to be a data scientist to start using Power BI for data analysis or understand how it presents information. The tool makes reading and presenting visual reports as simple or as detailed as you want it

The graphical interface for building dashboards is drag-and-drop, so you can organise data with a few clicks and customise how it is presented further by downloading free add-ons from Microsoft and third-party apps.

Beginners and experts can use Power BI desktop for quick explanations of increases or decreases in your data charts by right-clicking at data point and selecting the analyse button. This delivers automated smart analysis on your selected data using machine learning algorithms.

2. Unify large datasets into one dashboard

 Power BI can quickly create simplified visualisations of your most business-critical data that anyone can read and understand at a glance using official free add-ons.

## 3 Past trends, current performance, future predicting

Power BI is one such tool that provides great predictive analytics and forecasting features to explore reliable future outcomes.

4 Powerful tools in power bi

* + **Visualization(Microsoft has opened up the visualization SDK in Power BI. It has a huge library for custom visualization. Use this functionality, the users can customize the UI as per their need.)**

##### **Data Shaping(Power BI offers a tool called Query Editor which is very flexible and powerful with tons of features. The most important aspect is that it is self-documenting. It also offers you an opportunity to go deeper inside the DAX language.)**

##### **Data Modeling(Any BI solution is strong if the BI model is well-developed. Power BI comes with very efficient data modeling options based on their experience of SQL database and Cube technology.)**

Business intelligence applications like Power BI empower you to analyse your data and keep your company efficient, and provides you the tools necessary for better strategic analysis of how you can consolidate your data streams, improve accessibility and gain smarter insights.

**Ans 3 Descriptive Analytics**

Descriptive analytics is a commonly used form of data analysis whereby historical data is collected, organised and then presented in a way that is easily understood. Descriptive analytics is focused only on what has already happened in a business and, unlike other methods of analysis, it is not used to draw inferences or predictions from its findings.

Generally, the most simplistic form of data analytics, descriptive analytics uses simple maths and statistical tools, such as arithmetic, averages and per cent changes, rather than the complex calculations necessary for predictive and prescriptive analytics. Visual tools such as line graphs and pie and bar charts are used to present findings

Descriptive analytics is frequently used in the day-to-day operations of an organisation. Company reports – such as those on inventory, workflow, sales and revenue – are all examples of descriptive analytics that provide a historical review of an organisation’s operations. Data collected by these kinds of reports can be easily aggregated and used to create snapshots of an organisation’s operations.

Some examples of how descriptive analytics can be used include the following:

* Summarising past events such as sales and operations data or marketing campaigns
* Social media usage and engagement data such as Instagram or Facebook likes
* Reporting general trends
* Collating survey results

**Ans 4 Predictive Analytics**

While descriptive analytics focuses on historical data, predictive analytics, as its name implies, is focused on predicting and understanding what could happen in the future. Analysing past data patterns and trends by looking at historical data and customer insights can predict what might happen going forward and, in doing so, inform many aspects of a business, including setting realistic goals, effective planning, managing performance expectations and avoiding risks.

Predictive analytics is based on probabilities. Using a variety of techniques – such as data mining, statistical modelling (mathematical relationships between variables to predict outcomes) and machine learning algorithms (classification, regression and clustering techniques) – predictive analytics attempts to forecast possible future outcomes and the likelihood of those events. To make predictions, machine learning algorithms, for example, take existing data and attempt to fill in the missing data with the best possible guesses.

Since predictive analytics can tell a business what could happen in the future, this methodology empowers executives and managers to take a more proactive, data-driven approach to business strategy and decision making. Businesses can use predictive analytics for anything from forecasting customer behaviour and purchasing patterns to identifying sales trends. Predictions can also help forecast such things as supply chain, operations and inventory demands.

examples of industries in which predictive analysis can be used,include the following:

* **E-commerce** – predicting customer preferences and recommending products to customers based on past purchases and search history
* **Sales** – predicting the likelihood that customers will purchase another product or leave the store
* **Human resources** – detecting if employees are thinking of quitting and then persuading them to stay
* **IT security** – identifying possible security breaches that require further investigation
* **Healthcare** – predicting staff and resource needs

**Ans 5 Prescriptive Analytics**

If descriptive analytics tells you what has happened and predictive analytics tells you what could happen, then prescriptive analytics tells you what should be done. This methodology is the third, final and most advanced stage in the business analysis process and the one that calls businesses to action, helping executives, managers and operational employees make the best possible decisions based on the data available to them.

Prescriptive analytics takes what has been learned through descriptive and predictive analysis and goes a step further by recommending the best possible courses of action for a business. This is the most complex stage of the business analytics process, requiring much more specialised analytics knowledge to perform, and for this reason it is rarely used in day-to-day business operations

Prescriptive analytics anticipates what, when and, importantly, why something might happen. After considering the possible implications of each decision option, recommendations can then be made in regard to which decisions will best take advantage of future opportunities or mitigate future risks.

Examples of [prescriptive analysis application](https://www.sisense.com/glossary/prescriptive-analytics/), include the following:

* **Oil and manufacturing** – tracking fluctuating prices
* **Manufacturing** – improving equipment management, maintenance, price modelling, production and storage
* **Healthcare**– improving patient care and healthcare administration by evaluating things such as rates of readmission and the cost-effectiveness of procedures
* **Insurance** – assessing risk in regard to pricing and premium information for clients
* **Pharmaceutical research** – identifying the best testing and patient groups for clinical trials.

**Ans 6 Real life questions that power BI can solve**

1 Airport Authority Performance dashboard: The aviation industry saw huge growth in the number of passengers traveling around the world. Right now, there are more than 5,000 airplanes up in the sky around the world taking passengers or cargo to various destinations. However, maintaining these flights requires a lot of planning and real-time decision-making capabilities.

This is where tools like Power BI come into play; airport authorities use Power BI dashboards to track the number of planes taking off and landing at the airport. Power BI also helps airport authorities to set alerts if something goes wrong.

2 Excessive Time Spent Preparing For Presentations

Whether it’s for a meeting with potential investors, sharing the latest figures with your shareholders, or leading an internal meeting with your colleagues, presentation preparation can be tedious. On top of collecting all of the data you want to share, the information has to then be put into a visually appealing presentation. If you want to include charts, graphs, and images, presentations can take a significant amount of time to produce. In addition to that, by the time the presentation is complete, the data will already be outdated.

Power BI can quickly and easily create visual representations of your data and provide stunning and accurate presentations for your meetings. Using Power BI’s automated reporting tools can save hours of preparation

3 A hotel owner uses BI analytical applications to gather statistical information regarding average occupancy and room rate. It helps to find aggregate revenue generated per room.

It also collects statistics on market share and data from customer surveys from each hotel to decides its competitive position in various markets.

By analyzing these trends year by year, month by month and day by day helps management to offer discounts on room rentals.

4 A bank gives branch managers access to BI applications. It helps branch manager to determine who are the most profitable customers and which customers they should work on.

The use of BI tools frees information technology staff from the task of generating analytical reports for the departments. It also gives department personnel access to a richer data source.

5 Covid Analysis dashboard: As we all know, Covid-19 had a devastating impact on the entire human civilization. The sudden outbreak in all countries forced global leaders to take drastic measures in order to prevent the virus from infecting the larger population.

The Covid Analysis dashboard uses a heat map with a bunch of tables to show the number of Covid-19 cases around the world. It is a great project and makes you aware of the current situation.

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