

The background is a dark blue gradient. In the corners, there are white line-art illustrations of circuit boards or data paths, with lines extending from the edges towards the center and ending in small circles.

THE IMPORTANCE OF DATA VISUALIZATION IN BUSINESS INTELLIGENCE

CHAPTER 2

DATA VISUALIZATION

- Data visualization is the process of interpreting data and presenting it in a pictorial or graphical format.
- Data visualization helps people understand the significance of data by summarizing and presenting a huge amount of data in a simple and easy-to-understand format in order to communicate the information clearly and effectively.

SHIFTING FROM INPUT TO OUTPUT

- A decision-maker for any business wants to access highly visual business intelligence (BI) tools that can help to make the right decisions quickly.
- Business intelligence has become more mainstream; hence, vendors are beginning to focus on both ends of the pipeline and improve the quality of data input.
- There is also a strong focus on ensuring that the output is well-structured and clearly presented

WHY IS DATA VISUALIZATION IMPORTANT?

- A picture is worth a thousand words, as they say.
- Humans just understand data better through pictures rather than by reading numbers in rows and columns.
- Accordingly, if the data is presented in a graphical format, people are more able to effectively find correlations and raise important questions.

DATA VISUALIZATION HELPS THE BUSINESS TO ACHIEVE NUMEROUS GOALS.

- Converting the business data into interactive graphs for dynamic interpretation to serve the business goals.
- Transforming data into visually appealing, interactive dashboards of various data sources to serve the business with the insights.
- Creating more attractive and informative dashboards of various graphical data representations.
- Making appropriate decisions by drilling into the data and finding the insights.

DATA VISUALIZATION HELPS THE BUSINESS TO ACHIEVE NUMEROUS GOALS.

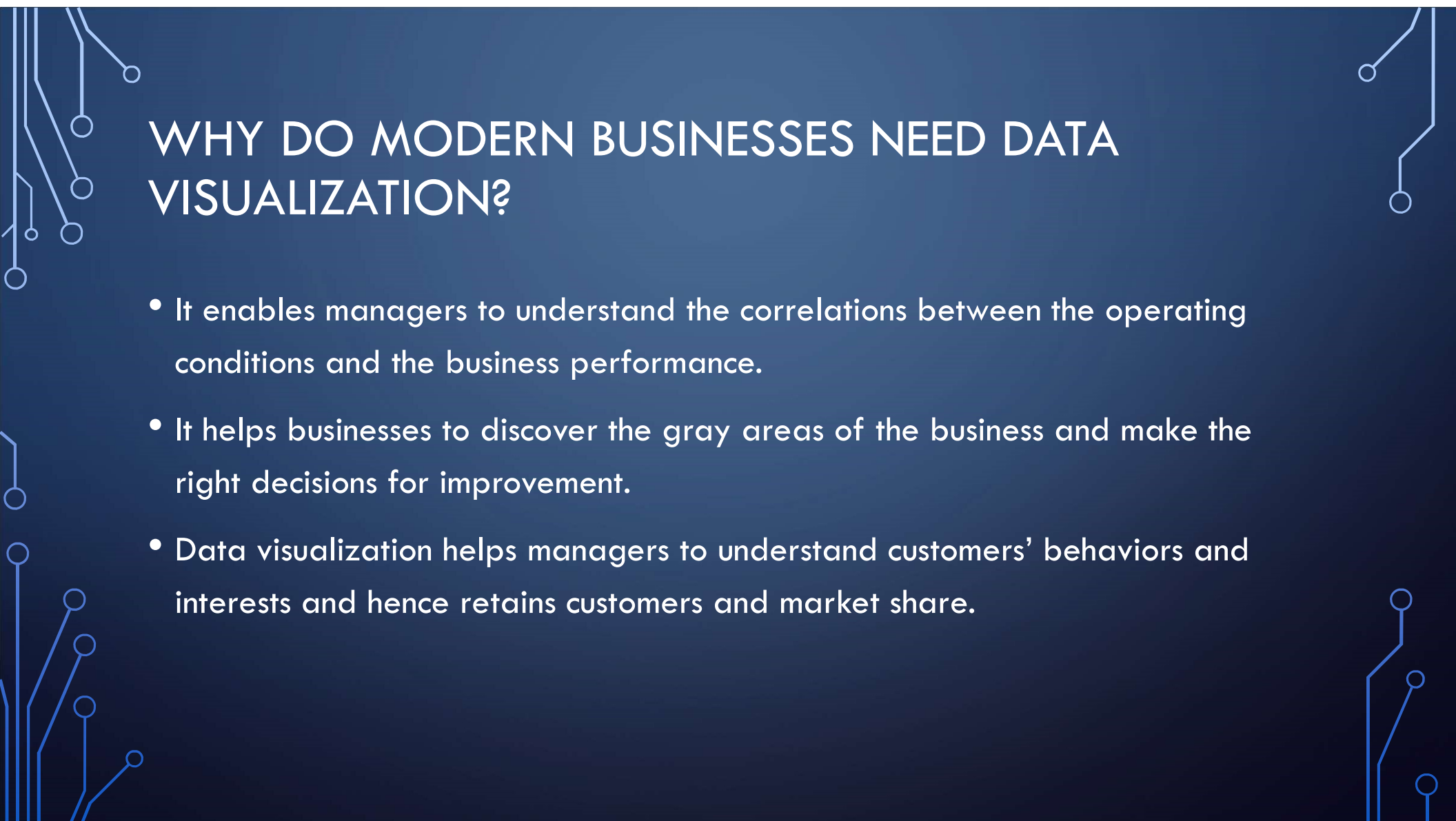
- Figuring out the patterns, trends, and correlations in the data being analyzed to determine where they must improve their operational processes and thereby grow their business.
- Giving a fuller picture of the data under analysis.
- Organizing and presenting massive data intuitively to present important findings from the data.
- Making better, quick, and informed decisions with data visualization.

WHY DO MODERN BUSINESSES NEED DATA VISUALIZATION?

- Data visualization helps companies to analyze its different processes so the management can focus on the areas for improvement to generate more revenue and improve productivity.
- It brings business intelligence to life.
- It applies a creative approach to understanding the hidden information within the business data.

WHY DO MODERN BUSINESSES NEED DATA VISUALIZATION?

- It provides a better and faster way to identify patterns, trends, and correlation in the data sets that would remain undetected with just text.
- It identifies new business opportunities by predicting upcoming trends or sales volumes and the revenue they will generate.
- It supplies managers with information they need to make more effective comparisons between data sets by plotting them on the same visualization.

The background of the slide is a dark blue gradient. It is decorated with white, stylized circuit board traces. These traces are located along the left and right edges, with some extending into the top and bottom corners. The traces consist of straight lines of varying lengths, connected by small circles, resembling a network or data flow diagram.

WHY DO MODERN BUSINESSES NEED DATA VISUALIZATION?

- It enables managers to understand the correlations between the operating conditions and the business performance.
- It helps businesses to discover the gray areas of the business and make the right decisions for improvement.
- Data visualization helps managers to understand customers' behaviors and interests and hence retains customers and market share.

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HOW DATA VISUALIZATION IS USED FOR BUSINESS DECISION-MAKING

- Faster Responses
- Simplicity
- Easier Pattern Visualization
- Team Involvement
- Unify Interpretation

INTRODUCING DATA VISUALIZATION TECHNIQUES

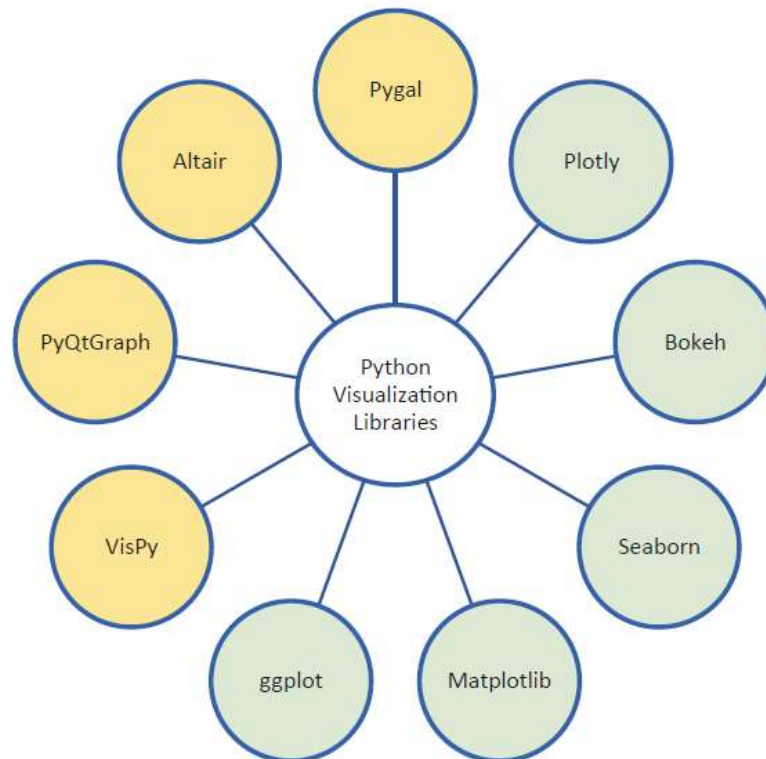
- Data visualization aims to understand data by extracting and graphing information to show patterns, spot trends, and identify outliers.
- There are two basic types of data visualization.
 - *Exploration* helps to extract information from the collected data.
 - *Explanation* demonstrates the extracted information.

LOADING LIBRARIES

- Some libraries are bundled with Python, while others should be directly downloaded and installed.

```
python -m pip install -U pip setuptools  
python -m pip install matplotlib
```

Description	pip	conda Anaconda
Works with	Python and Anaconda	Anaconda only
Search a package	<code>pip search matplotlib</code>	<code>conda search matplotlib</code>
Install a package	<code>pip install matplotlib</code>	<code>conda install matplotlib</code>
Upgrade a package	<code>pip install matplotlib-upgrade</code>	<code>conda install matplotlib-upgrade</code>
Display installed packages	<code>pip list</code>	<code>conda list</code>



POPULAR LIBRARIES FOR DATA VISUALIZATION IN PYTHON

- The Python language provides numerous data visualization libraries for plotting data.
- Each of these libraries has its own features. Some of these libraries may be adopted for implementation and dependent on other libraries.

MATPLOTLIB

- Matplotlib is a Python 2D plotting library for data visualization built on Numpy arrays and designed to work with the broader SciPy stack.
- It produces publication-quality figures in a variety of formats and interactive environments across platforms.

SEABORN

- Seaborn is a Python data visualization library based on Matplotlib that provides a high-level interface for drawing attractive and informative statistical graphics.

PLOTLY

- The Plotly Python graphing library makes interactive, publication-quality graphs online.
- Different dynamic graphs formats can be generated online or offline.

GEOPLOTLIB

- Geoplotlib is a toolbox for creating a variety of map types and plotting geographical data.
- Geoplotlib needs Pyglet as an object-oriented programming interface.
- This type of plotting is not covered in this course.

PANDAS

- Pandas is a Python library written for data manipulation and analysis.
- You can use Python with Pandas in a variety of academic and commercial domains, including finance, economics, statistics, advertising, web analytics, and much more.
- Pandas is covered in Chapter 6.

INTRODUCING PLOTS IN PYTHON

- Basic plotting
- Direct plotting
- Stacked bar plot
- Horizontal bar plots
- Histograms
- Box plot
- Area plot
- Scatter plot

SUMMARY

- Understand the importance of data visualization.
- Acknowledge the usage of data visualization in modern business and its future implementations.
- Recognize the role of data visualization in decision-making.
- Load and use important Python data visualization libraries.