

Chapter 3

An Introduction to Data Visualisation: An Overview of Visualizing Data

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ABSTRACT

Data visualization is the process of producing interactive visualizations to study patterns and variances and extract useful insights from data. Any technique that enables the identification of insights inside a dataset is considered data visualization. A data analyst will assess a dataset and produce charts based on the results. Data visualizations consist of bar graphs, heat maps, world maps, and line graphs. Typically, data visualization is used for data verification and cleansing, exploration and discovery, and communicating business outcomes to important stakeholders. The vast majority of data scientists neglect visualizations and rely solely on frequently misleading numerical calculations. Thus, the proposed chapter has addressed the most prevalent data visualization approaches.

INTRODUCTION

Data visualization is the display of data using standard graphics such as charts, plots, info-graphics, and even animations. These info-graphics help to convey complex data relationships and data-derived insights. The term "data visualization" is also used to describe statistical graphics (or "charts"), particularly when they are interactive. It is critical to understand that data visualization can be used for a wide range of purposes and is not just for data teams. The visual representation of data, information, or knowledge in a graphical format to convey insights and meaning to an audience is known as data visualization. It is used by management to communicate organizational structure and hierarchy, and it is used by data analysts and data scientists to identify and explain patterns and trends. In both cases, data visualization

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aids in the conversion of numbers into a visual format that can be used to identify patterns, trends, and anomalies in large data sets.

Enterprises in the digital era are collecting large data sets containing rich and diverse information on an unprecedented scale. The usefulness of these data sets is significantly reduced in the absence of proper visual presentation. According to Pise, Vadapalli, and Sanders (2020) the primary data visualization functions are idea generation, idea illustration, visual discovery, and daily dataviz. We'll go over these topics in greater depth further down. It is common practice to use data visualization to spark the creativity of an entire team. Facilitate the exchange of ideas while emphasizing the group's common concerns. Customer demographic breakdowns, business trends, identifying non-value-added activities, and so on are examples of this. Despite the fact that these visualizations are typically unpolished and unrefined, they contribute to the project's foundation by ensuring that the team and key stakeholders have a shared understanding of the problem they wish to solve (Sadiku et al., 2016). Given the preceding example, if our data visualization sparked a discussion about addressing social issues in education, and a subset of our team wanted to focus on lowering the drop-out rate among American children in low-income areas, we could visualize this data using two charts: one showing the drop-out rate in our state, and another showing the rates in different cities across the country.

In an ideal data visualization, a diagram helps to communicate an idea, such as a method or strategy. It is commonly used in learning environments such as tutorials, certification courses, and centers of excellence, but it can also be used to represent organizational structures or processes, facilitating communication among the appropriate people for the job. Project managers frequently use Gantt charts and waterfall charts to depict workflows. In terms of daily data visualization and visual discovery, the data teams are more aligned. Data visualization facilitates the subsequent narrative construction process, whereas visual discovery allows data analysts, data scientists, and other data professionals to identify patterns and trends in a dataset on a daily basis (Masoumi, Libbrecht, and Wiese, 2022). Diagrammatic devices can be used for anything from abstract depictions to very concrete diagrams used in project management.

Data visualization is an important step in the data science process because it enables teams and individuals to communicate data with coworkers and decision-makers more effectively. It is important to remember, however, that this skill set can and should extend beyond your core analytics team. Visualizations can do more than just show trends and patterns in data; they can also provide insights into these patterns that aren't as obvious when looking at raw data. Unlike traditional approaches, which rely heavily on complex statistical formulas and models, data visualization makes it easier to identify outliers, patterns, and trends in data.

The remainder of this chapter is organized as follows. In Section 2, a brief idea of Data Visualization Pipeline is explained with basic introduction. In Section 3, Areas of Big Data Analytics in medicine are discussed. In Section 4, Concept of Healthcare a Big Data Repository is briefly explained. Then, Section 5 presents Applications of Healthcare Big Data with examples and in Section 6 Challenges in Big Data Analytics are provided. Big Data Privacy and Security policies are explained in Section 7. The remaining Sections provide a conclusion and future work.

Data Visualization Pipeline

Creating a data model is not always the end of a project. In many cases, data visualization will be critical when communicating your findings to the client. Because not all clients are data savvy, Tableau tools can

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