

# Chapter 10

## User-Centric Data viz Creating: An Approach Through User- Centered Design

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### ABSTRACT

*Digital transformation and technological evolution have allowed a huge volume of information to be created and shared, and this context is a valuable input for organizational decision-making. In this scenario, the need to create data sharing and visualization strategies that privilege human aspects becomes mandatory once it is people who will make the decisions. Thus, this work covers user-centered design (DCU) views, their principles, and the role of user experience design applied to data visualization as an approach that places the human factor in this process. The authors intend to inform the reader of general and key principles of the DCU that, when applied to data visualization, improve the graph, panels, presentation elaborations, and make it clearer to the audience. In addition, this approach also improves the understanding of these data, as they will be created respecting specific characteristics of the people who will use these artifacts, since the human factor will be included before creating them.*

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## **INTRODUCTION**

Artificial intelligence, user browsing data on the web, the heavy machinery routes in an iron ore mine or rainfall data collected that informs the irrigation system the amount of water must be provided to plantations are some examples of the complex scenario of data generation that we deal with daily.

In this scenario, data collection and processing have become a fundamental component in the companies' digital transformation process, as operational and strategic decision-making arrive through this data: implementation of new processes fully mediated by cloud-computing that generate cost reduction, incremental or even total innovation of products and services are some examples of news process that can be implemented based in data collection and analysis. This current context brought the need to create assertive sharing and visualizing data strategies for the most varied stakeholders and occupying different roles like CEOs, project sponsors, managers, technicians, analysts, consumers. They are responsible for transforming thousands of data's terabytes to value and meaning for others.

The data storage and supply are, nowadays, one of organizations' assets. A complex task that demands an ongoing effort of learning and development. For all organizations that want to implement their digital transformation, many of the aspects that involve data storage and sharing are often a new and unknown universe to the managers and technicians' teams. So, they will need an approach that requires methodology, tools and professionals empowered to make this data effectively accessible.

It means not only providing access to data, but offering friendly and assertive ways that will facilitate the analyst's effort to navigate through this data's universe, which currently is already quite supported by the tools and guidelines provided by Data Visualization.

Data Visualization is a set of tools, techniques that help graphically visualize abstract information. It was in the 17th century that the Scotsman William Playfair thought it was a great idea to describe the trade balance between Denmark and Norway, in the period 1700 to 1780, through a graph. Maybe at that moment Mr. Playfair did not have the clarity of the great cognitive advantages that this type of approach would offer. Or how it would forever change the way we would deal with the increasing amount of data that humanity would generate every second for centuries to come.

Advances in the understanding of human cognition have brought more clarity to the advantages obtained by transforming data to visual representations for later analysis, and today we already understand how to create shortcuts for a better understanding of the data we access. An example of this is we already know that most people understand information much better if this information is represented (or communicated) by images than through text. And that the human brain processes

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