

## Using Tableau to visualize data and support decision-making

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### ABSTRACT

Data visualization is a fundamental concept in modern data analysis, enabling organizations to transform complex data into actionable insights. Tableau, a powerful data visualization tool, plays a pivotal role in this process. In this article, we explore the application of Tableau in the context of human resources (HR) management, a critical aspect of organizational strategy. We delve into various visualization techniques offered by Tableau and demonstrate their application in uncovering meaningful insights within HR data. Through real-world examples, we showcase Tableau's capability to visualize key HR indicators effectively.

### 1. Introduction

Visual data is more comprehensible than textual information. Because a picture is worth a thousand words, it can tell stories and convey a set of data more effectively than words alone. Visual representations of data are more compelling than representations based on numbers, because the human mind can process graphic images more easily than tables of numerical text, because tables usually require additional reading to fully understand the meaning and relationship of the values presented.[1]

Indeed, this article highlights the importance of data analysis through the use of data visualization software. Data visualization software helps you to understand data and transform it into information that can improve the decision-making process. Inside the data visualization software.[2]

In an ever-changing business environment, effective human resources (HR) management has become a strategic imperative for organizations seeking to maintain their competitiveness. With the rise of Big Data and data analytics, companies now have a vast reservoir of data on their employees, covering aspects such

as recruitment, retention, performance and job satisfaction. However, simply accumulating data is not enough; transforming it into actionable insights is essential to guide strategic decisions.

This is where data visualization tools come in. Visualization brings data to life by presenting it in graphs, tables and other visual formats, making it easier to understand trends and the complex relationships between variables.

Among these tools, Tableau stands out as one of the market leaders, offering a wide range of functions for exploring, analyzing and presenting data in an intuitive and interactive way.

We'll then dive into Tableau's various features and show how they can be applied to effectively visualize HR Analytics data, highlighting key metrics such as recruitment, retention and employee performance. Through concrete examples and use cases, we will illustrate the power of Tableau in HR Analytics data visualization, highlighting its ability to transform complex datasets into clear and informative visualizations. Finally, we will discuss the benefits and implications of using Tableau in this context, as well as best practices for taking full advantage of this tool.

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Together, this article provides an in-depth exploration of the use of Tableau for advanced HR Analytics data visualization, highlighting its crucial role in helping decision-makers understand.

## 2.Related work

Exploring the field of data visualization tools across a variety of disciplines, the researchers examined a range of platforms for different analytical needs. Among these, Power BI, a Microsoft product, attracted attention for its user-friendly interface and robust visualization capabilities. Studies have demonstrated its effectiveness in visualizing data in a variety of areas, from financial analysis to marketing metrics, highlighting its versatility and adaptability.

In addition, Python libraries such as Matplotlib and Seaborn have been widely explored for their flexibility and customisation options for data visualization in a variety of domains. Researchers have used these libraries to create a wide range of visualizations, from basic plots to complex statistical graphs, enabling insightful exploration and analysis of data.

Open source platforms such as RStudio were also examined for their integration of statistical modeling and visualization capabilities. Researchers have used RStudio to visualize data in a variety of disciplines, from healthcare analysis to environmental studies, demonstrating its usefulness for extracting meaningful information from diverse datasets.

Emerging visualization tools like Qlik Sense and Grafana have gained traction for their interactive features and intuitive design. Studies have showcased Qlik Sense's applicability across different domains, from supply chain management to customer relationship analysis, highlighting its role in facilitating data-driven decision-making processes. Similarly, Grafana's focus on real-time analytics and monitoring has found applications in industries ranging from IT operations to IoT data visualization, showcasing its versatility in handling streaming data and generating actionable insights.

By synthesizing insights from studies utilizing various visualization tools, researchers gain a comprehensive understanding of the evolving landscape of data visualization and its instrumental role in extracting actionable insights from complex datasets across different domains.

## 3.Project Description

The project aims to explore and analyze human resources data (HR Analytics) using the Tableau tool. The data used in this project includes information on recruitment, retention, employee satisfaction and other relevant metrics collected from various internal sources within the organization.

### 3.1 Méthodologie

The methodology involves several key steps, including:

#### 3.1.1 Collect of data :

HR Analytics data was collected from several internal organizational sources, such as human resources management systems (HRIS), employee satisfaction surveys, recruitment and training databases, and other relevant sources. These data were collected over a set period, ensuring consistency and relevance of information for subsequent analysis.

#### 3.1.2 Data pre-processing:

The data collected was subjected to a rigorous pre-processing process to ensure its quality and integrity. This included removing duplicates, managing missing values, normalizing data where necessary, and detecting and correcting any errors or inconsistencies in records. This process was designed to ensure the reliability of the data used in the analysis.

#### 3.1.3. Visualization with Tableau :

Once the data had been pre-processed, the Tableau tool was used to create dynamic, interactive visualizations. The data was connected to Tableau, and different types of visualizations were developed to explore trends and relationships within the HR Analytics data. Dashboards were designed to effectively present key HR performance indicators, providing a comprehensive overview of the HR situation within the organization.

#### 3.2 Dashboards visualisés :

**Department wise attrition:** The "Attrition by department" dashboard enables decision-makers to visualize and understand attrition trends in each department of the organization. This detailed understanding of attrition makes it possible to identify the departments most affected, and to take appropriate measures to improve staff retention.

**Number of employees by age group:** The "Number of employees by age group" dashboard provides an in-depth analysis of the demographic composition of the organization's workforce by age group. This enables decision-makers to better understand the needs and preferences of different age groups, and to adapt policies and programs accordingly.

**Job satisfaction:** The "Job satisfaction" dashboard provides an overview of employee job satisfaction ratings across different departments or categories. By understanding job satisfaction levels, decision-makers can identify areas requiring attention to improve employee engagement and well-being.

**Attrition by field of education:** The "Attrition by field of education" dashboard examines attrition according to employees' field of education. By identifying areas where attrition is more prevalent, this dashboard enables decision-makers to target retention initiatives specific to each field.

**Attrition rates for different age groups:** The "Attrition rates for different age groups" dashboard provides a detailed analysis of attrition rates for different age groups within the organization. This visualization enables a comparison between age cohorts, and makes it easier to identify the groups most likely to leave the company.

**Attrition by gender:** The "Attrition by gender" dashboard analyzes attrition by employee gender. This analysis highlights potential departure disparities between men and women, enabling decision-makers to take action to promote equal opportunities and diversity in the workplace.

Then these dashboards offer a holistic view of HR Analytics data, enabling decision-makers to make informed decisions to improve HR management and optimize organizational performance.

By providing in-depth insights into key aspects such as attrition, employee demographics, job satisfaction and gender disparities, these dashboards enable decision-makers to fully understand the dynamics of their workforce. This in-depth understanding of HR Analytics data enables them to take proactive measures to mitigate attrition risks, strengthen employee engagement and foster a more inclusive and equitable work environment.

#### 4.Evaluation

In this section, we evaluate the performance of the tableau tool for dashboard visualization.

The use of Tableau in our HR Analytics dashboards is validated on several fronts to guarantee the reliability and relevance of the information provided and its ability to effectively guide decision-making:

**Visualization quality:** every visualization created in our dashboards is rigorously examined for clarity, accuracy and the ability to convey information effectively. Clear graphics and well-structured tables are favored to ensure quick and intuitive understanding of data.

**Relevance of information:** the conclusions drawn from the visualization were assessed in terms of their relevance to our organization's specific HR challenges. We consulted HR experts and key stakeholders to validate the conclusions drawn from the visual data.

**Decision-making capability:** We organized demonstration and feedback sessions with decision-makers to assess the ability of our Tableau dashboard to help them in their decision-making process. End-users expressed satisfaction with the ease of use and usefulness of the visualizations in informing their decisions.

**Impact on decision-making:** By tracking the adoption of recommendations based on visualized insights, we were able to assess the impact of our Tableau dashboard on decision-making. We observed positive changes in human resources management policies and practices, demonstrating the effectiveness of our dashboard in guiding strategic decisions.

In addition, using Tableau offers several significant advantages for HR Analytics data visualization, including:

**Flexibility:** Tableau provides flexibility in data exploration and visualization, allowing users to quickly adapt to changing analytical needs and explore various perspectives within HR data.

**Improved Decision-Making:** Dynamic graphs and interactive dashboards let users explore data from different angles, uncovering valuable insights to guide HR strategies.

**Ease of use:** Tableau offers a user-friendly interface that enables users, even without advanced technical expertise.

**Interactivity:** visualizations created with Tableau are highly interactive, allowing users to explore data in depth.

**Collaboration:** Tableau facilitates collaboration between teams by making it easy to share visualizations and dashboards.

#### 5.Discussion

Using Tableau for data visualization has proved extremely beneficial in facilitating decision-making in a variety of contexts. The interactive, customizable visualizations created with Tableau have enabled in-depth exploration of the data, leading to significant insights and a better understanding of trends and patterns.

Comparing our study with other similar research into the use of Tableau or other data visualization tools, we found that Tableau offered a wide range of features and possibilities for creating complex and informative visualizations. Although other tools may have specific functionalities, Tableau stands out for its ease of use and flexibility.

Despite Tableau's advantages, our study also presents certain limitations. Firstly, the effectiveness of the tool depends largely on the quality of the underlying data. Inaccurate or incomplete data can compromise the reliability of the insights obtained. What's more, although Tableau is a powerful tool for data visualization, it can be costly and require in-depth training for optimal use. What's more, some of Tableau's advanced features may require specialized technical skills to exploit them fully.

Despite its limitations, Tableau remains a valuable tool for data visualization and decision support. The insights gained from using Tableau can have a significant impact on organizational operations and strategies, enabling decision-makers to make more informed and effective decisions.

Based on the results of our study, we recommend avenues for future research in this area. It would be interesting to conduct further studies to assess Tableau's effectiveness in different organizational contexts, and to explore more advanced data integration methods for optimizing visualizations. In addition, research could be undertaken to examine best practice in training Tableau users and to assess the long-term impact of using this tool on organizational performance.

#### 6.Conclusion

This article has highlighted the importance of using Tableau for data visualization to support decision-making in a variety of fields. In short, Tableau has proven to be a powerful and versatile tool for exploring, analyzing and presenting data in an interactive and informative way.

The results of our analysis demonstrated that using Tableau not

only enables in-depth data exploration, but also the discovery of meaningful insights and the understanding of underlying trends and patterns. The visualizations created with Tableau made it easier to communicate complex information clearly and effectively, enabling decision-makers to make more informed and effective decisions.

While our study revealed many benefits of using Tableau, it's important to recognize its limitations. Challenges such as the quality of the underlying data, the associated costs and the technical skills required may limit its effectiveness in some cases. This study has highlighted the importance of using Tableau for data visualization to support decision-making in a variety of fields. In short, Tableau has proven to be a powerful and versatile tool for exploring, analyzing and presenting data in an interactive and informative way.

In conclusion, Tableau offers considerable potential for data visualization and decision support. By leveraging its advanced features while taking into account its limitations, organizations can fully exploit Tableau's potential to transform their data into meaningful insights and lead to more informed and strategic decisions.

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