Departamento
de Controle do Espaço Aéreo
Department of Airspace Control

ATM047 Course – ATM Performance Indicators

ATM047 Course – ATM PERFORMANCE INDICATORS

Unit 1.3 – DATA ANALYSIS

Subunit 1.3.1 – DATA VISUALIZATION

October – 2024

Data Visualization

5 8 9 8 0 5 4 3 1 7 8 5 3 5 9 0 7 6 5

3 2 3 4 5 5 6 5 7 8 9 1 0 2 8 5 6 7 8

4 7 4 2 9 0 5 1 5 6 7 8 9 2 0 4 3 5 7

7 4 5 8 9 5 1 3 5 8 9 5 4 6 7 8 3 5 2

0 7 4 3 8 5 9 1 4 7 8 9 0 2 3 5 7 6 1

2 5 6 7 8 9 5 5 6 7 8 9 0 9 8 7 3 4 5

Data Visualization

5 8 9 8 0 5 4 3 1 7 8 5 3 5 9 0 7 6 5

3 2 3 4 5 5 6 5 7 8 9 1 0 2 8 5 6 7 8

4 7 4 2 9 0 5 1 5 6 7 8 9 2 0 4 3 5 7

7 4 5 8 9 5 1 3 5 8 9 5 4 6 7 8 3 5 2

0 7 4 3 8 5 9 1 4 7 8 9 0 2 3 5 7 6 1

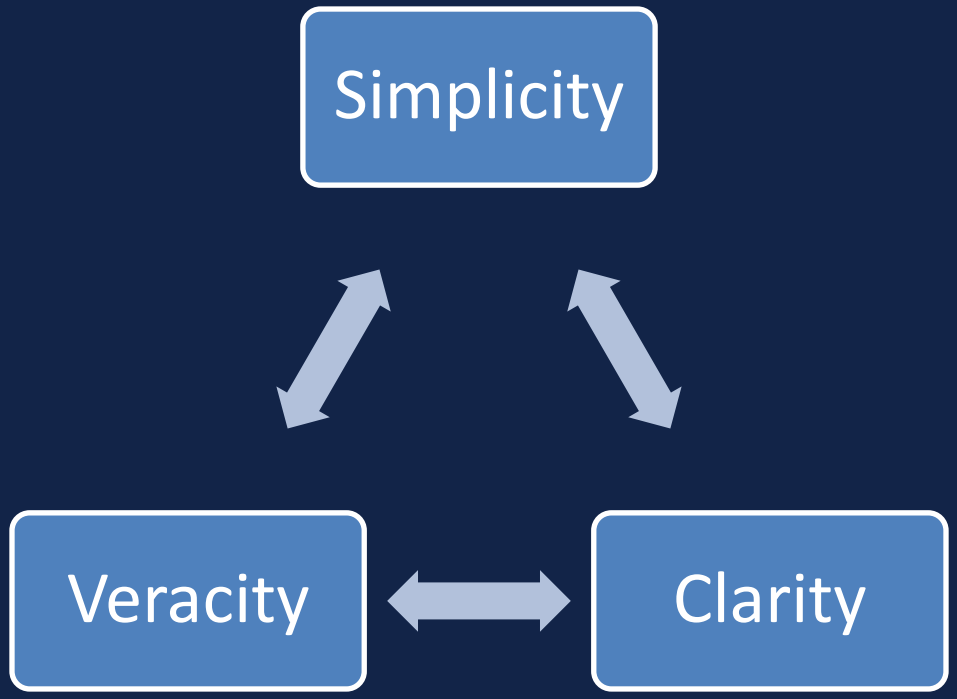
2 5 6 7 8 9 5 5 6 7 8 9 0 9 8 7 3 4 5

Data Visualization

- Data visualization consists of the presentation of information through visual elements, usually through tables and graphs.

- In this way, it is easier to analyze the results, helping the process of identifying trends and making decisions.

Data Visualization



Data Visualization

GRAPHS

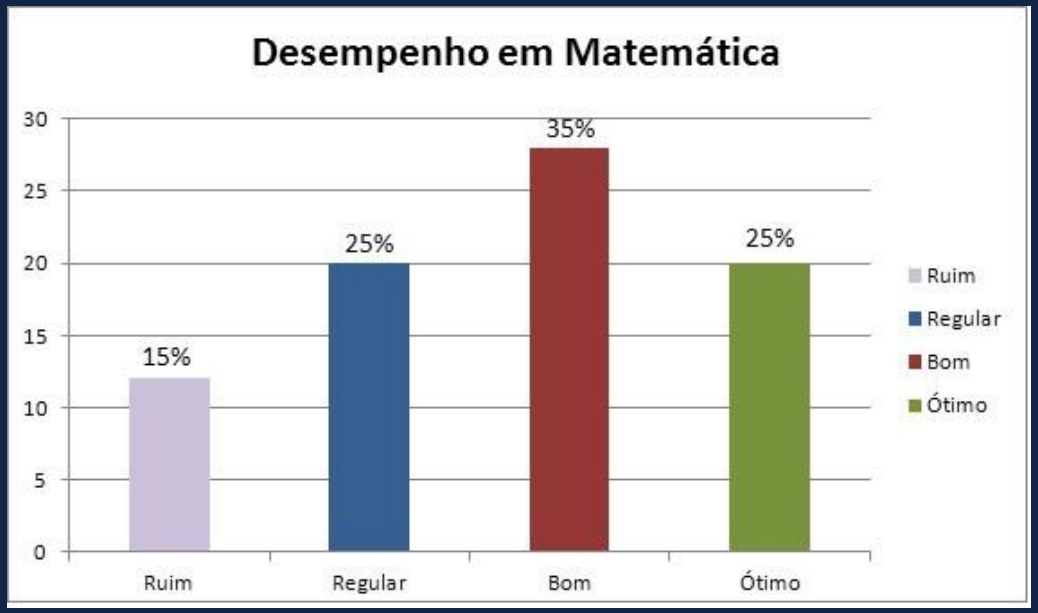
- There are many varieties of graphical representation, and the choice depends on the types of data that exist, as well as the information that is intended to be transmitted.

- The main types of charts that allow you to simplify, clarify, and highlight a set of information for decision-making are: columns, bars, lines, sectors, threads, histogram, combination, area, dispersion, bubbles, surface, and radar.

Data Visualization

COLUMN CHARTS

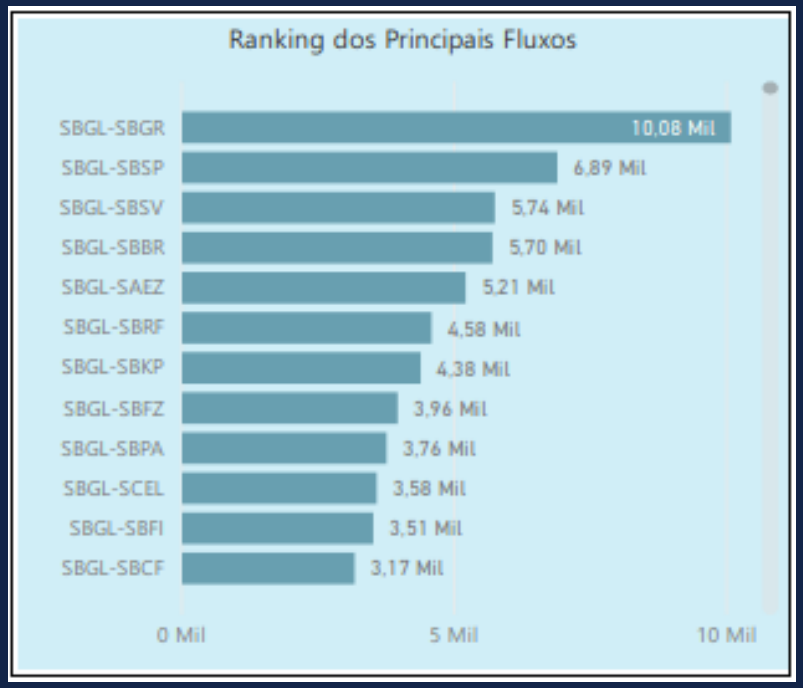
- Column charts are useful for showing data changes over a period of time or for illustrating comparisons between items. In these column charts, categories are arranged along the horizontal axis and values along the vertical axis.



Data Visualization

BARS CHARTS

- Data that is organized into columns or rows in a spreadsheet can be plotted in a bar chart, which illustrates comparisons between individual items, commonly used to present rankings.



Data Visualization

LINE CHARTS

- Line charts can display continuous data over time, defined relative to a common scale, and are therefore ideal for showing trends in data at equal intervals. Category data is evenly distributed along the horizontal axis, and value data is distributed along the vertical axis.

Data Visualization

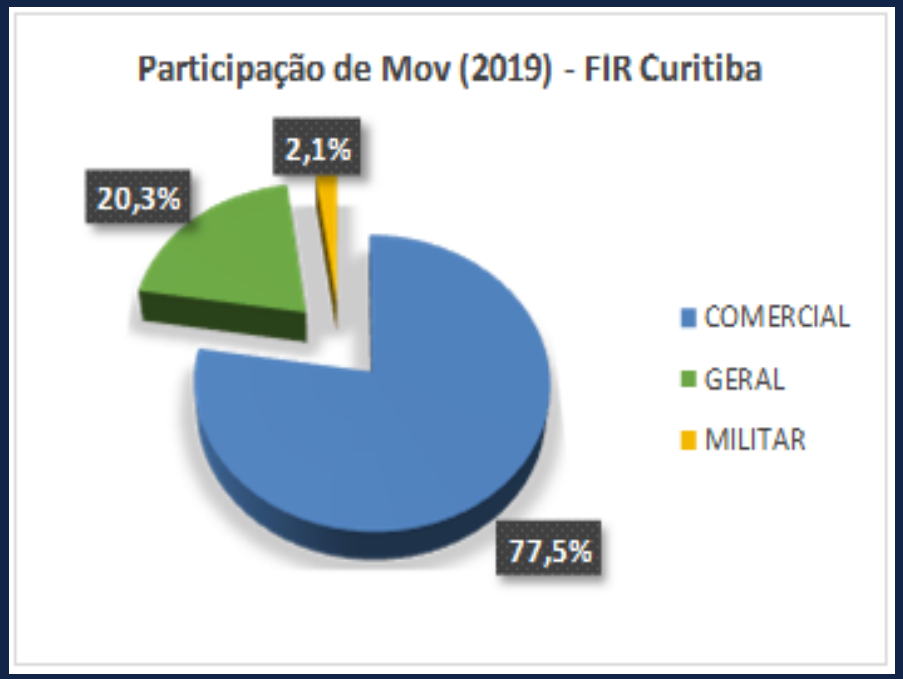
PIE CHARTS

- Data organized into columns or rows in a spreadsheet can be plotted in a pie chart, which shows the size of items in a data series, proportional to the sum of those items.

Data Visualization

PIE CHARTS

- The best use of this graph is considered when: there is only one data series; none of the values in the data are negative; there are few categories with values equal to zero; and there are no more than seven categories.



Data Visualization

DONUT CHARTS

- Data that is organized into columns or rows can be plotted on a donut chart. Like a pie chart, a doughnut chart shows the relationship of parts to a whole and can contain more than one set of data.

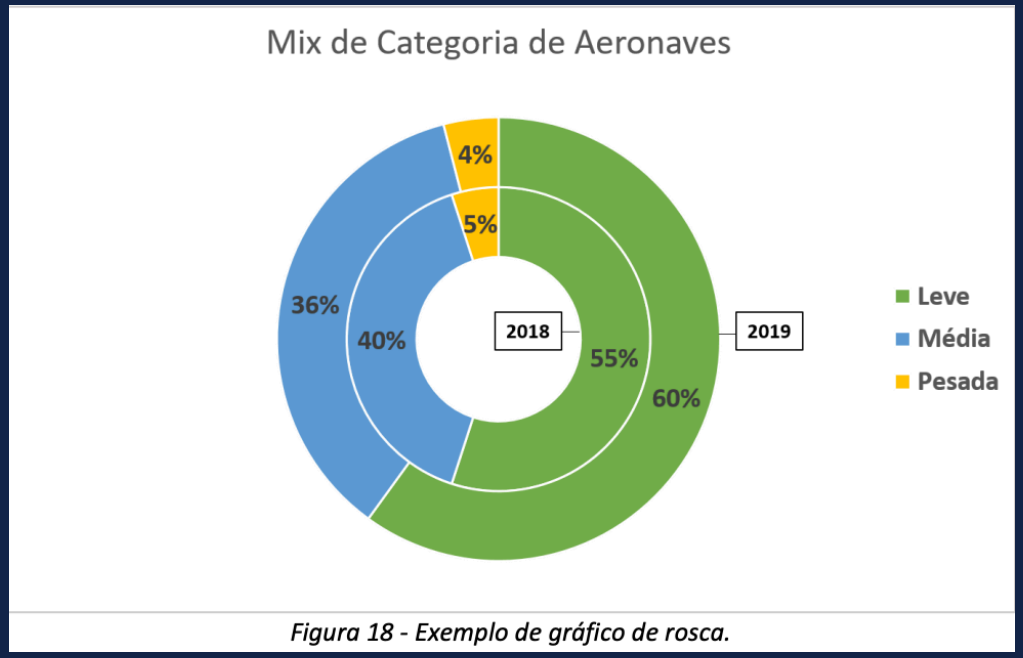
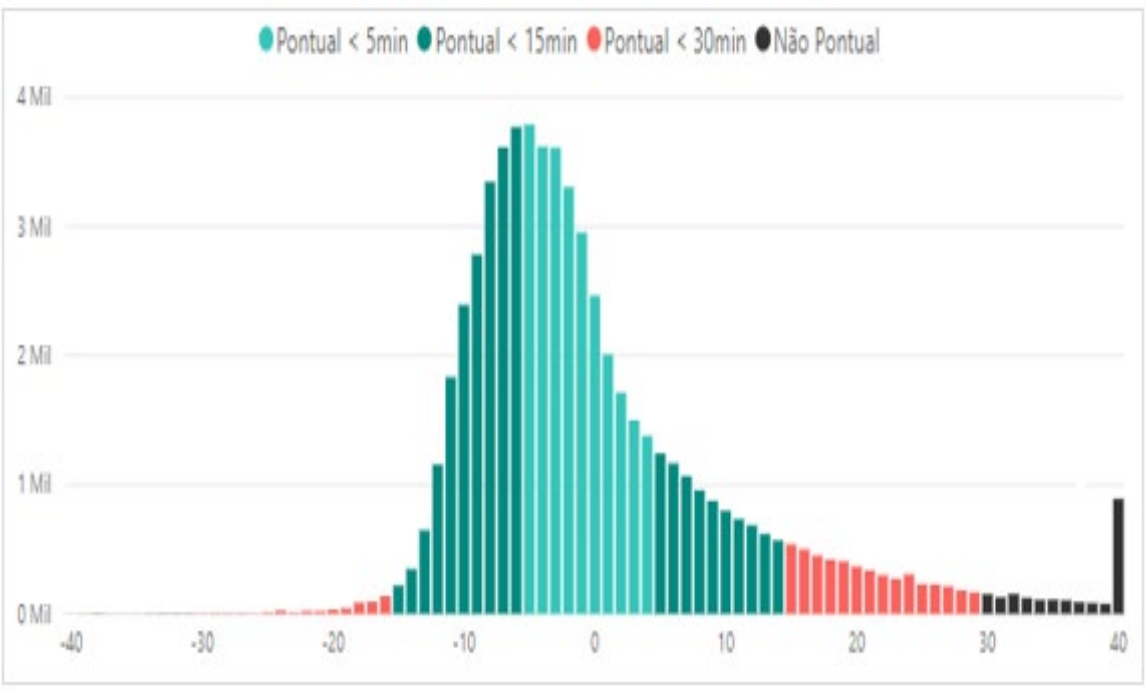


Figura 18 - Exemplo de gráfico de rosca.

Data Visualization

HISTOGRAM CHARTS

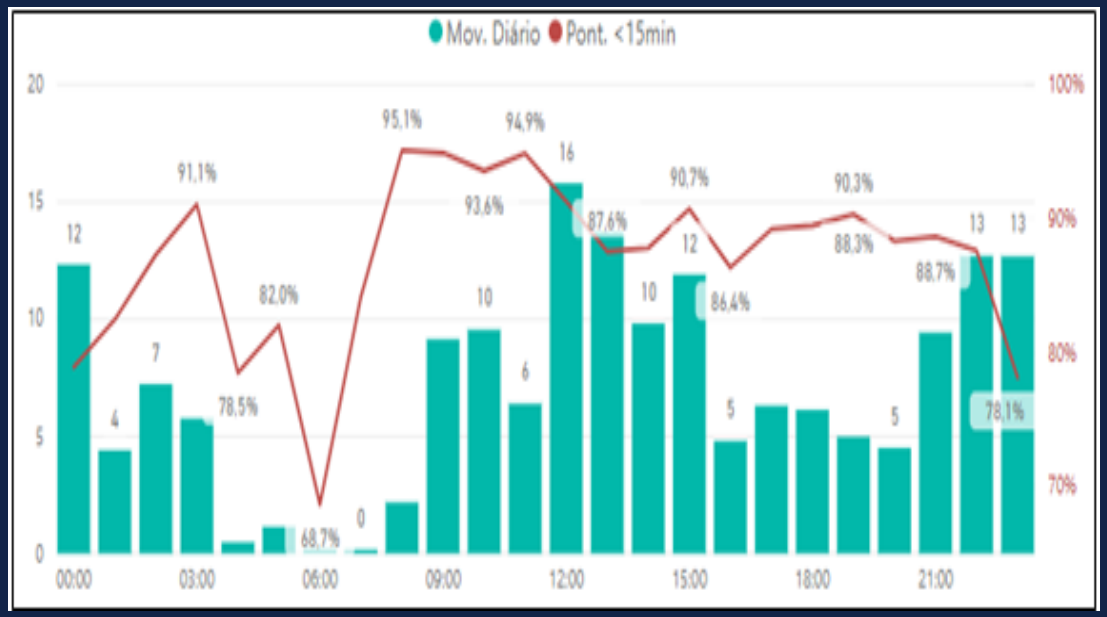
- The data plotted on a histogram diagram shows the frequencies within a distribution. Each column in the chart is called a bin.



Data Visualization

COMBINED CHARTS

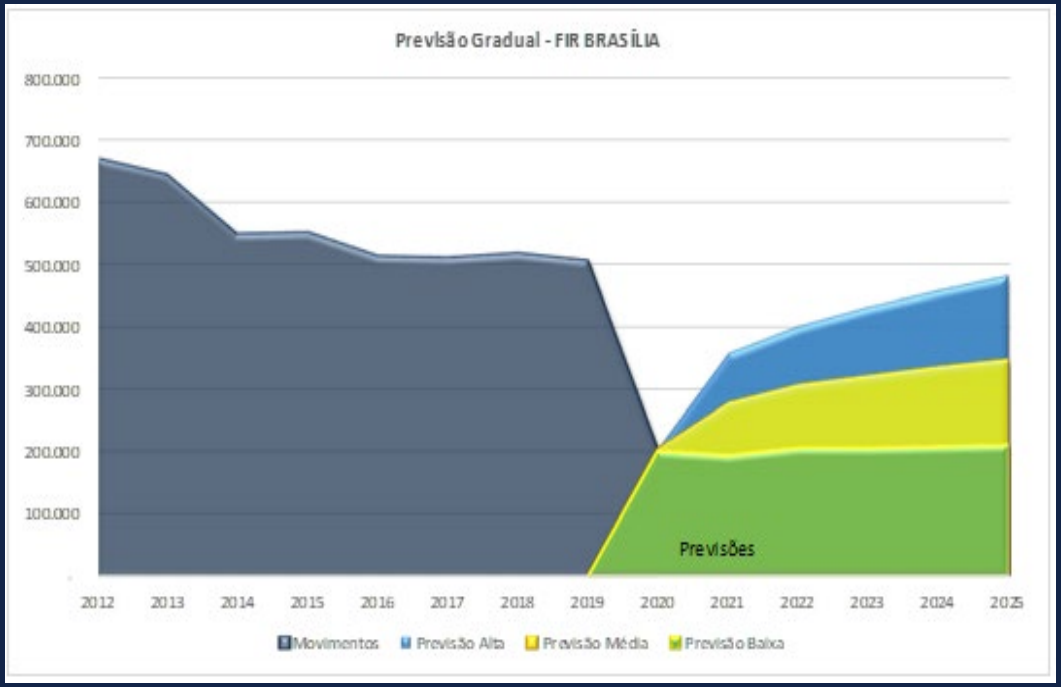
- Data organized into columns and rows can be plotted in a combined chart. This chart combines two or more types of charts to make it easier to interpret the data, especially when there are data series with very different scales.



Data Visualization

AREA CHARTS

- Data organized into columns or rows in a spreadsheet can be plotted in an area chart. These charts emphasize the magnitude of change over time and can be used to draw attention to the total value over a trend.



Data Visualization

SCATTER PLOT

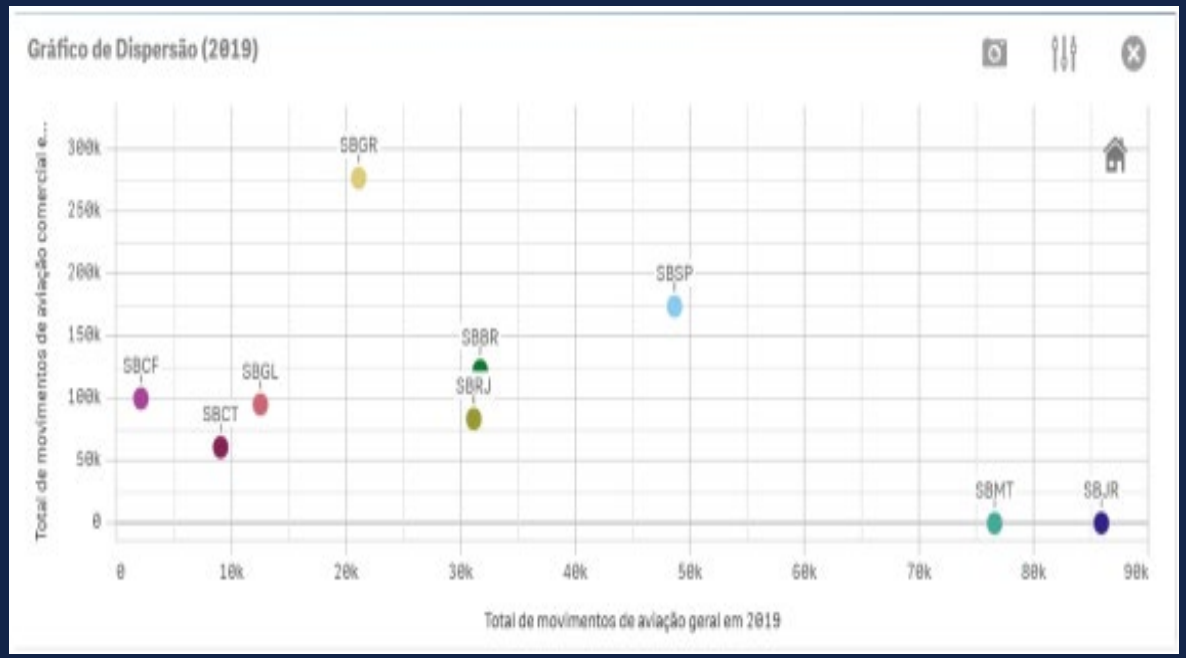
- Data organized in columns or rows in a spreadsheet can be represented in a scatter plot (XY). These charts show the relationships between two groups of numbers as a sequence of XY coordinates.

- A scatter plot has two value axes, which show one set of numerical data along the horizontal axis (X-axis) and another along the vertical axis (Y-axis). It combines these values into single data points and displays them at irregular intervals.

Data Visualization

SCATTER PLOT

- These charts are often used to display and compare numerical values, such as scientific, statistical, and engineering data. In other words, it is used with the intention of showing how much one variable affects the other.



Data Visualization

BUBBLES CHARTS

- Data that is organized into columns in a spreadsheet can be plotted in a bubble chart so that the X values are listed in the first column, while the corresponding Y values and bubble size values are listed in adjacent columns.

Data Visualization

BUBBLE CHARTS

- This chart is a variation of a scatter plot in which the points are replaced by bubbles, and an additional dimension of the data is represented in the size of the bubbles.

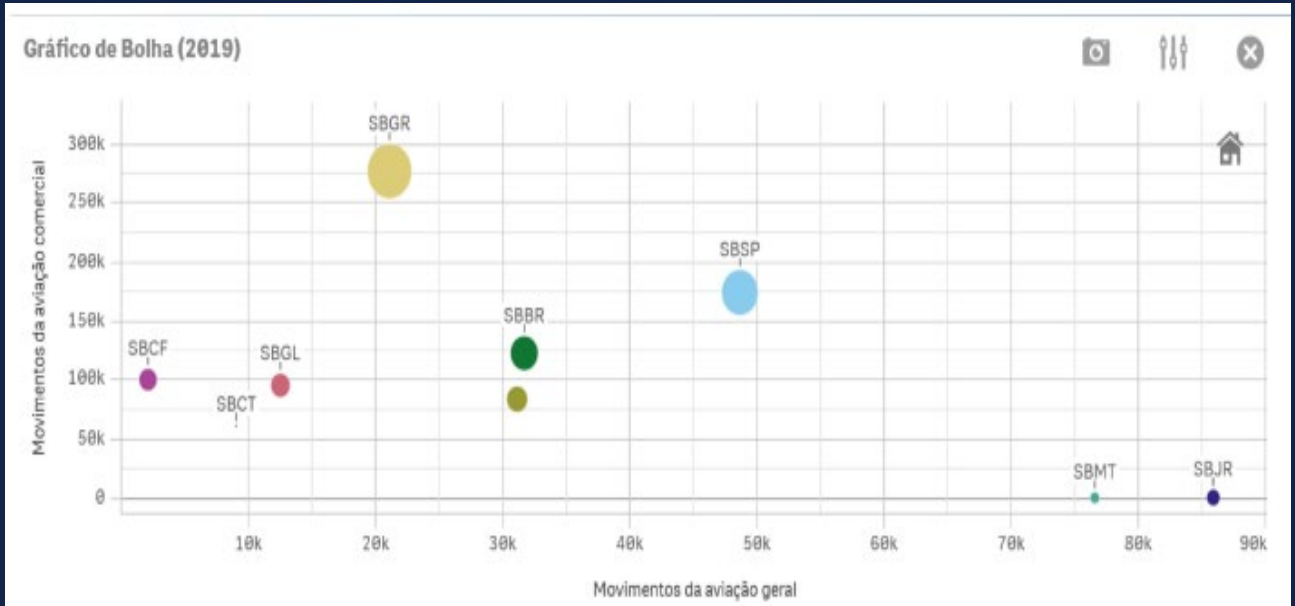


Figura 23 - Exemplo de gráfico de bolhas.

Data Visualization

RADAR CHARTS

- Data organized in columns or rows in a spreadsheet can be plotted on a radar chart, which compares the aggregate values of various data series, providing the presentation of several dimensions at the same time, because it has easy visualization and uniformity of units of measurement.

- This type of chart is suitable for showing values outside the data series or showing a large distance from the others, as well as a possible inconsistent value. On the other hand, you can still show the similarities of groups or categories, describing which variables stand out when compared.

Data Visualization

RADAR CHARTS

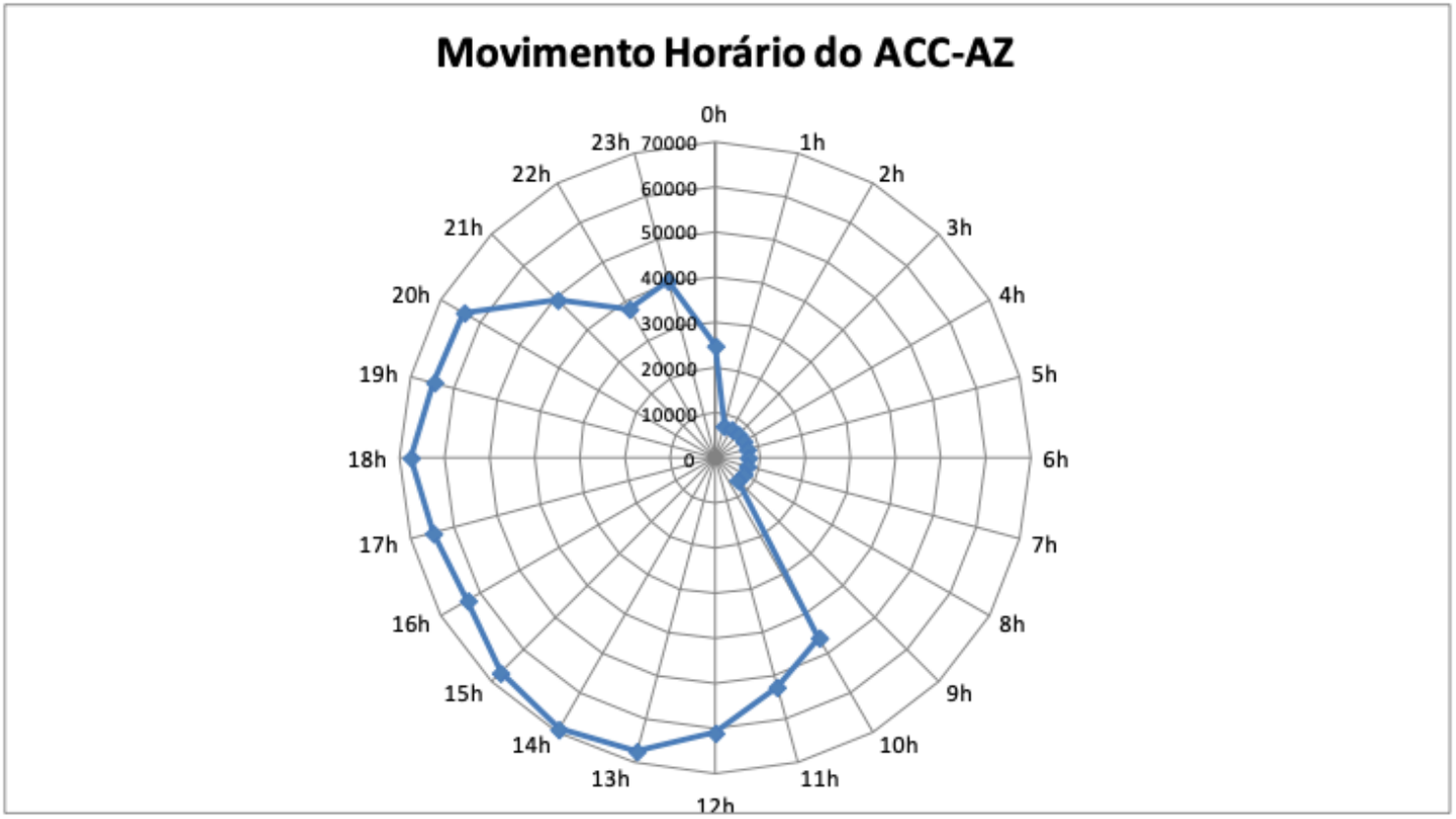


Figura 23 - Ejemplo de gráfico de radar.

ATM047 COURSE – ATM PERFORMANCE INDICATORS

Unit 1.3 – DATA ANALYSIS

Subunit 1.3.1 – DATA VISUALIZATION

Departamento
de Controle do Espaço Aéreo
Department of Airspace Control

FORÇA AÉREA BRASILEIRA
Asas que protegem o País