# Design Principles of Executive Sales Dashboard

## Introduction

John Sweller's (1988) cognitive load theory states that a person's working memory is finite, and a limited amount of information can be processed at one time, especially if that information is not stored in long term memory. Cognitive overload can occur when too much information must be processed that exceeds the available working memory resources, leading to slower understanding of information and reducing the ability to make data driven decisions (Likourezos, 2021). The primary aim when considering the design principles for the dashboard is to minimise cognitive load with the layout and delivery of information.

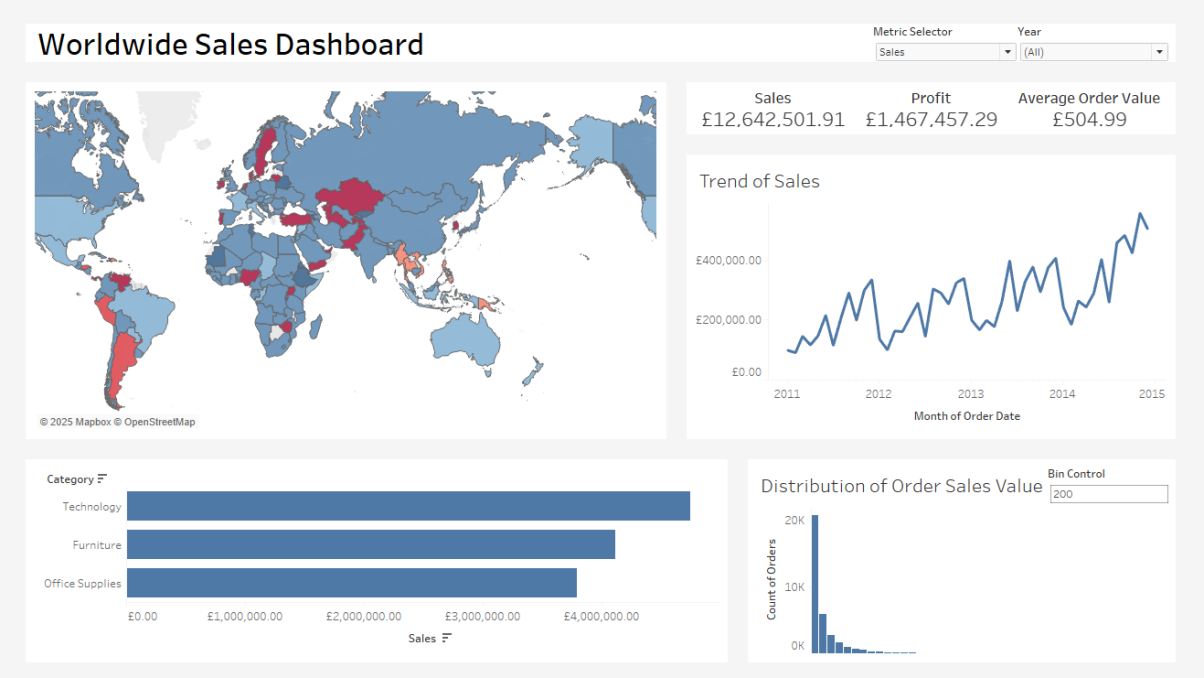


*Figure 1: Overview of Dashboard layout.*

## Structure

### Audience and Objective of Dashboard

The dashboard is aimed at Executives and Regional Managers, meaning that they want a broad top-level overview of the data being shown, and the ability to drill down if needed. The information presented needs to be simple, intuitive and easy to find.

The key metrics for the visualisation are sales and profit, this information needs to be conveyed in a useful manner to the business and users. The final Dashboard created can be seen in Figure1.

### Layout and formatting

Containers were used to get consistent and distinct grid alignment of each visualisation; inner and outer padding was also given to each visualisation and the background shading was set to a light grey to separate the graphs and help with readability. The grey background colour of the

dashboard is a more subtle and neutral colour, helping to distinguish the visualisations without adding more information for the user to process.

**Colours**

The colours were kept simple and less saturated to be easier on the eyes. In the dashboard, colour is used sparingly to fit with the idea of minimising cognitive strain and faster decision making, this is because overuse of colours can have an adverse effect on the time taken to make decisions (Bera, 2016). The colour in the dashboard also helps highlight where the information is in the dashboard, it highlights that the information is relevant and helps the user focus. Blue helps convey professionalism and stability which is suitable for the business use case, a diverging Red-Blue colour palette was used for the heatmap to indicate good and bad profit ratio clearly and intuitively (FreshBI, 2025).

**Visual Hierarchy**

Visual hierarchy refers to how humans process information when presented on a page. Z Patterns refers to the way someone commonly processes visual information and helped guide where information was placed on the page, it refers to starting on the top left, moving horizontally to the top right, transitioning to the bottom left and finishing on the bottom right as shown in Figure 2.

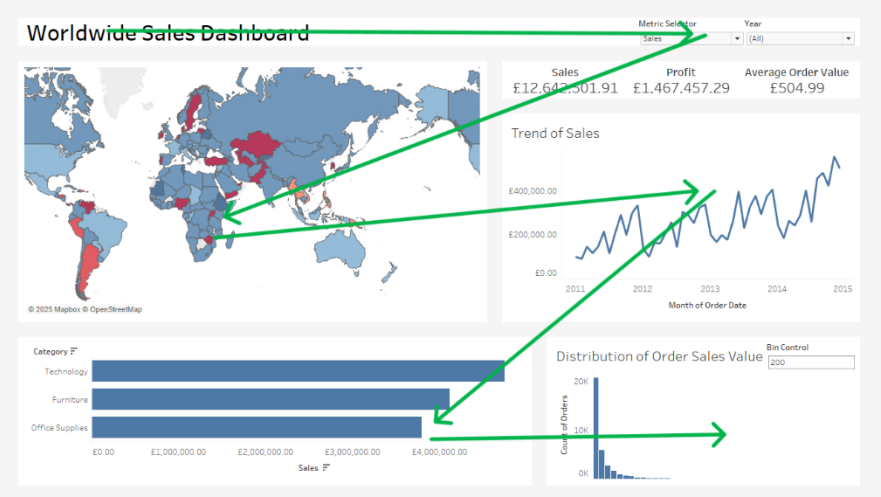


*Figure 2: Example of z pattern page navigation.*

Size is also impactful on drawing the user's attention, the larger the element the more likely it is to get the attention (Marshall, N.D,). The discussed elements of visual hierarchy were considered when positioning the visuals and elements on the page, the focus being the Choropleth showing global profit ratio performance, with the next being the KPI's and trend graph over time.

## Visuals and Interactivity

**Choice of Visuals**

Choropleth:

As the dashboard is focused on the health and performance of the business worldwide, a choropleth map was used to aid in location-specific analysis. A heatmap with diverging colour palette gives a clear indication of high performing and low performing areas immediately. An

alternative visual could have been a dot density map with colour used in the same way and size of the dots indicating the quantity of orders in that area. A dot density map in the described context would add more complexity however, possibly making the information conveyed harder to interpret.

KPI's:

KPI's for the 3 main metrics of the dashboard were shown as clear numbers side by side, giving a fast summary of the important values.

Line graph:

A line graph was used to convey business performance over time in a simple continuous manner. Other charts such as bar or area chart could have been used, but this would have added further complexity and not been as clean.

Bar Chart:

A bar chart was used to compare categories against a single metric. The bars were ordered from large to small, simplifying the pattern to follow the Gestalt Law of Prägnanz (Choudhury, 2014).

Histogram:

A histogram was used to show the distribution of order values. It helps show where the data is clustered and that there are some outlier orders that have a much larger value. The x-axis values did not show cleanly in the element size given, so it was decided it was not needed to convey the important information, the values of each bin are available in the tooltip (Tableau, N.D.).

**Filter choices**

The user can filter for metric (profit or sales), year/month, country and product category.

Placement of the filters was intentional to fit visual hierarchy as shown in figure 2, their placement fits with the visual flow. The placement of the bin control in the relevant visual it relates to helps the user keep focus on that visualisation when altering the value without getting distracted.

Interactive filtering was also implemented in visuals to minimise clutter caused by drop down filters.

The filters encourage the user to explore and interact with the data. It helps the user control their view with the benefit of adhering to cognitive load theory in minimising the amount of information on the dashboard at one time (Yellowfin BI, 2021).

Information foraging theory indicates that the filters make the user more likely to interact with the dashboard as it reduces the effort required to find the valuable information (Budiu, 2019).

## Summary

There are lots of factors that influenced the design principles of the Executive Sales Dashboard. Conveying the information in a clear and user-specific way is just as important as the data itself. Relating design principles to Cognitive Load Theory, Gestalt Principles and other theories can help design a dashboard that is easy for the user to interpret, and they are more likely to engage with the story it is telling.

**References**

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