DM & Visualization - Exam 2021-06-17 - Solution

Figure 1: The top 10 football clubs by market value

Analysis

Analyze the above graph illustrating the top 10 football clubs by market value.

Question: Is there one (or more) question addressed by the visualization?

The question is quite clear: what are the top 10 football clubs by market value and how does it compare with their annual revenue and with their agreement to join the European Super League?

Data: Is the data quality appropriate?

Accuracy: the values reported are reasonable, it is not clear how *current value* is computed.

Completeness: data are not complete, as only the top 10 football clubs are considered.

Consistency: data should be consistent if *current value* is computed with the same methodology for all clubs.

Currency: data were probably updated in 2020, but this is not reported in the visualization.

Credibility: the source is mentioned in the logo and it is a well-known and trusted magazine about finance.

Understandability: data are quite understandable, it is not clear that the revenue is annual.

Precision: precision is appropriate, but it varies among different clubs (from 0 to 2 decimal digits).

Visual Proportionality: Are the values encoded in a uniformly proportional way?

The football balls look proportional to the corresponding values. However, this visualization has serious perceptual problems because it is very difficult to compare areas represented by football balls. The balls are not aligned and they are also divided to represent two values.

Visual Utility: All the elements in the graph convey useful information?

Several elements are useless: the football field in the background, the balls, the stars, the logos.

Visual Clarity: Are the data in the graph clearly identifiable and understandable (properly described)?

Data are understandable because the numerical values are reported. It is very difficult to compare these values because they are not properly aligned. The number of stars has no real meaning. The rank is very clear because each football club is associated with a number.

Design

Design the visualization based on the following data structure

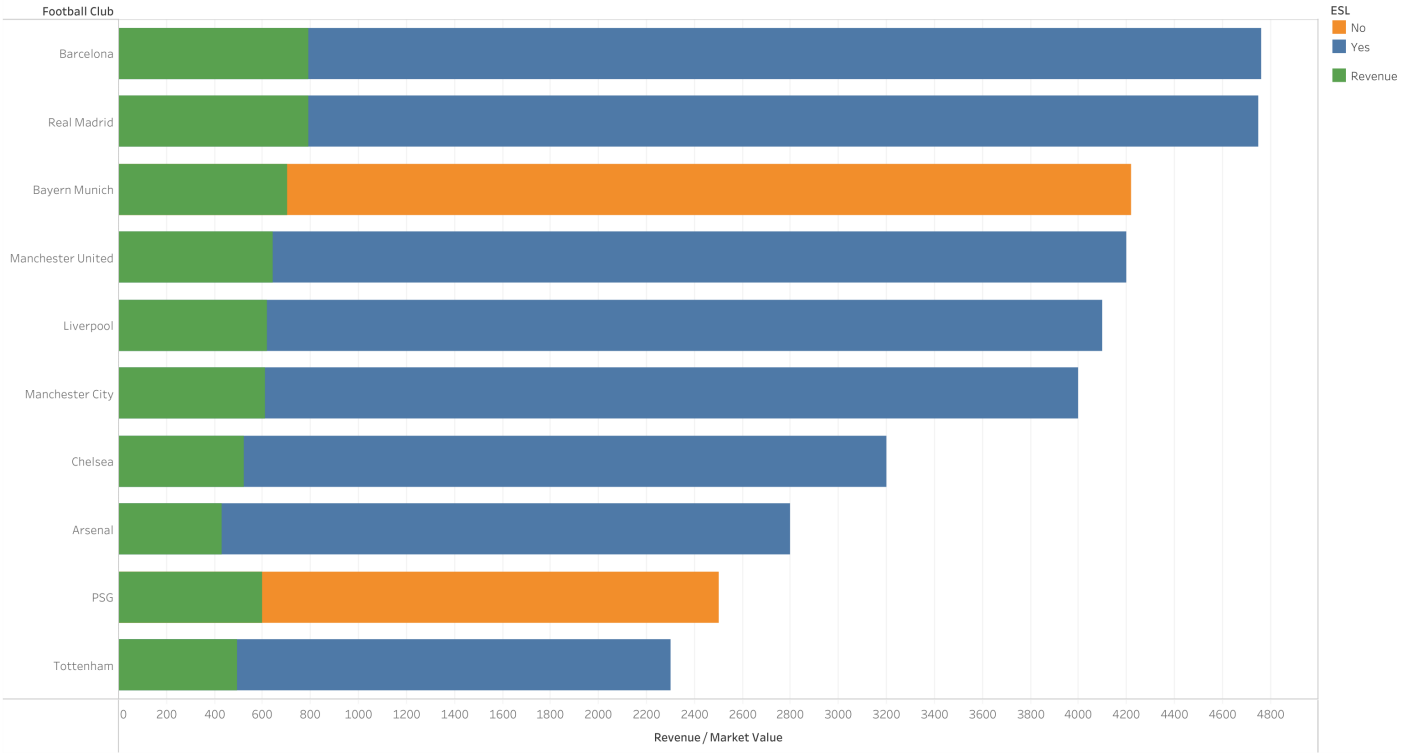
Field	Dim./Measure	Description
CLUB_NAME	Dimension	The name of the football clubs
CURRENT_VALUE	Measure	The current value of the club
REVENUE	Measure	The annual revenue of the club
SUPER_LEAGUE	Dimension	If the club agreed to join European Super League

Design schema

Schema	Details
Columns:	SUM(CURRENT_VALUE), SUM(REVENUE)
Rows:	CLUB_NAME
Graph type:	Bar with double axis
Color:	SUPER_LEAGUE
Size:	Default
Label:	Default

Sketch of the resulting graph

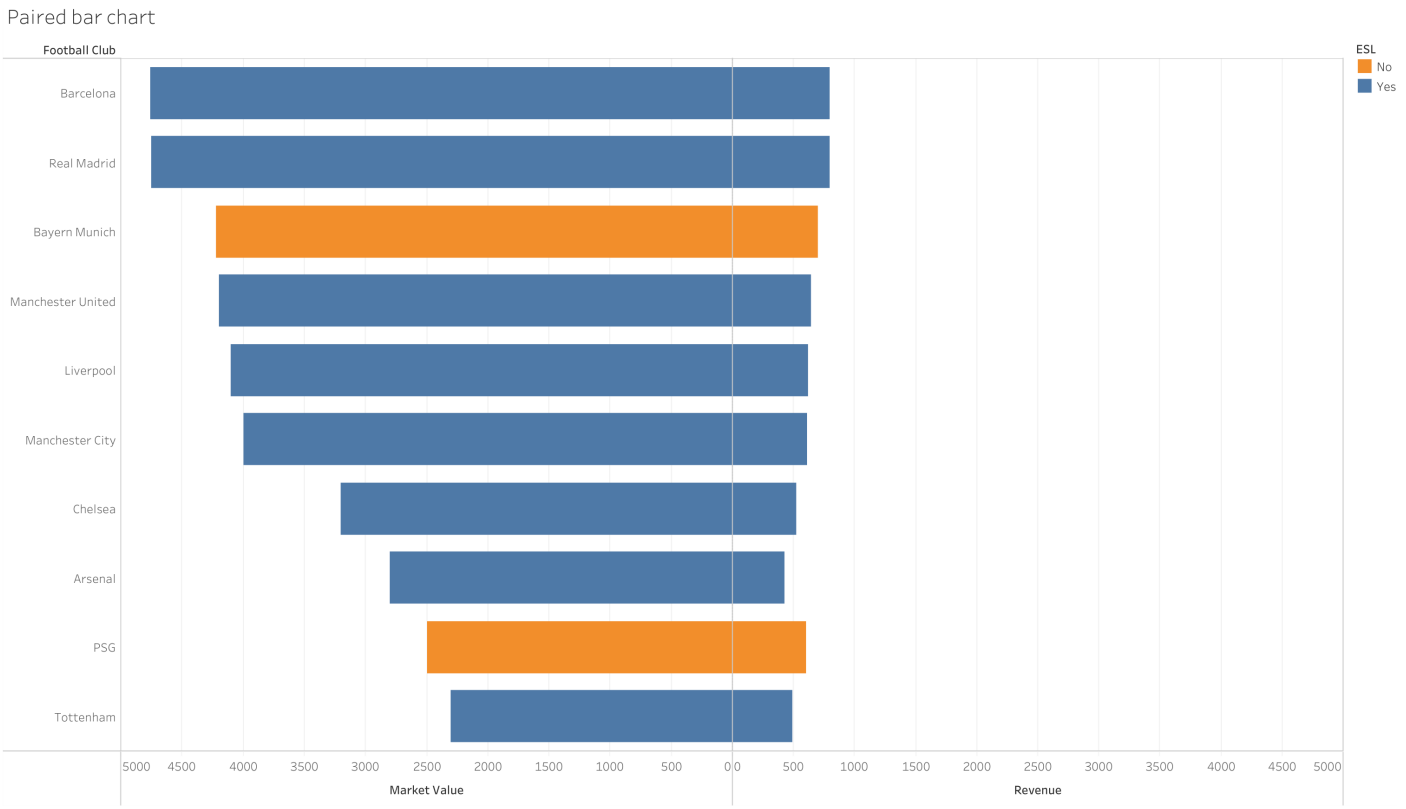
Stacked bar chart



Design schema

Schema	Details
Columns:	SUM(CURRENT_VALUE), SUM(REVENUE)
Rows:	CLUB_NAME
Graph type:	Bar with an inverted axis
Color:	SUPER_LEAGUE
Size:	Default
Label:	Default

Sketch of the resulting graph

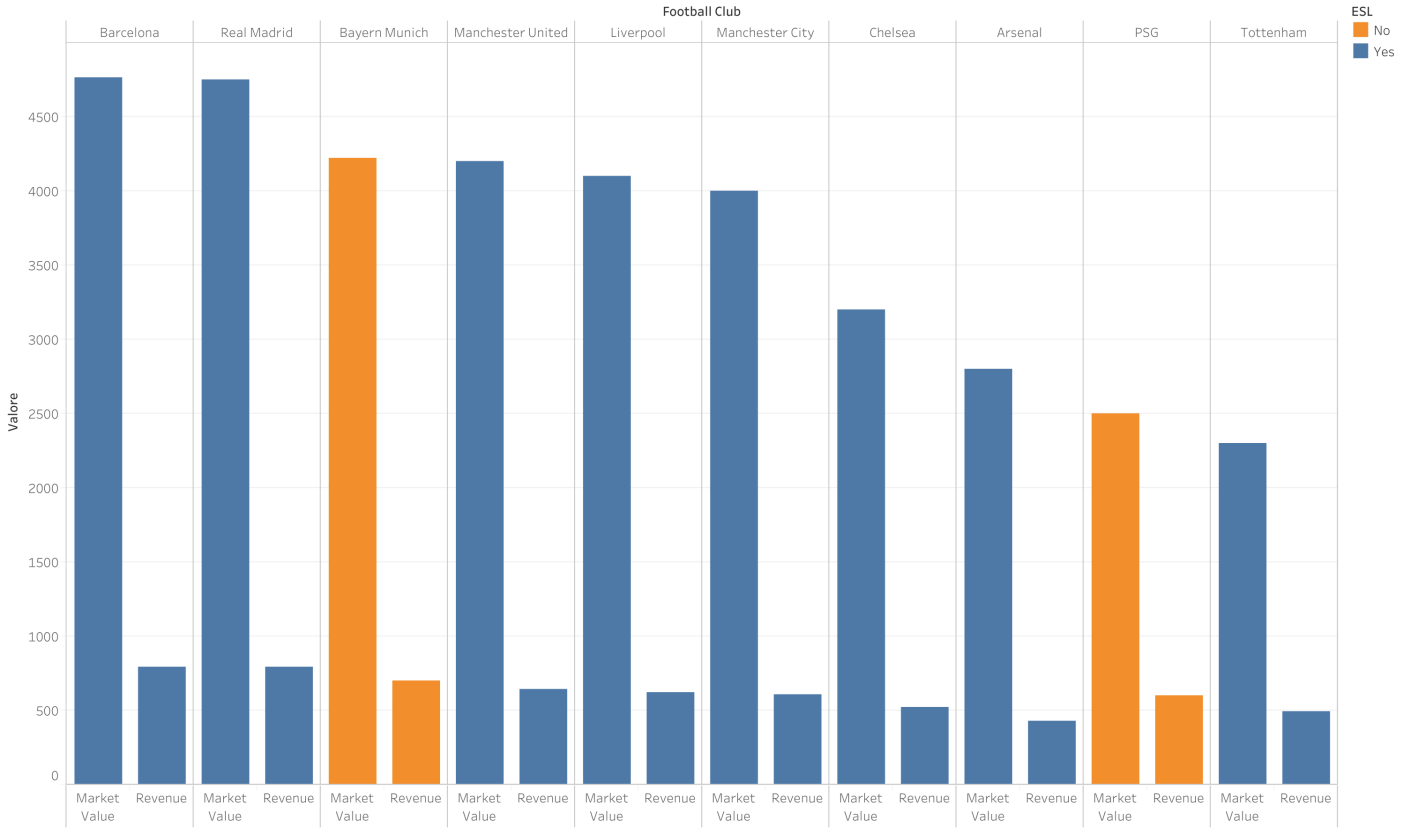


Design schema

Schema	Details
Columns:	CLUB_NAME, Names
Rows:	Measures
Graph type:	Bar
Color:	SUPER_LEAGUE
Size:	Default
Label:	Default

Sketch of the resulting graph

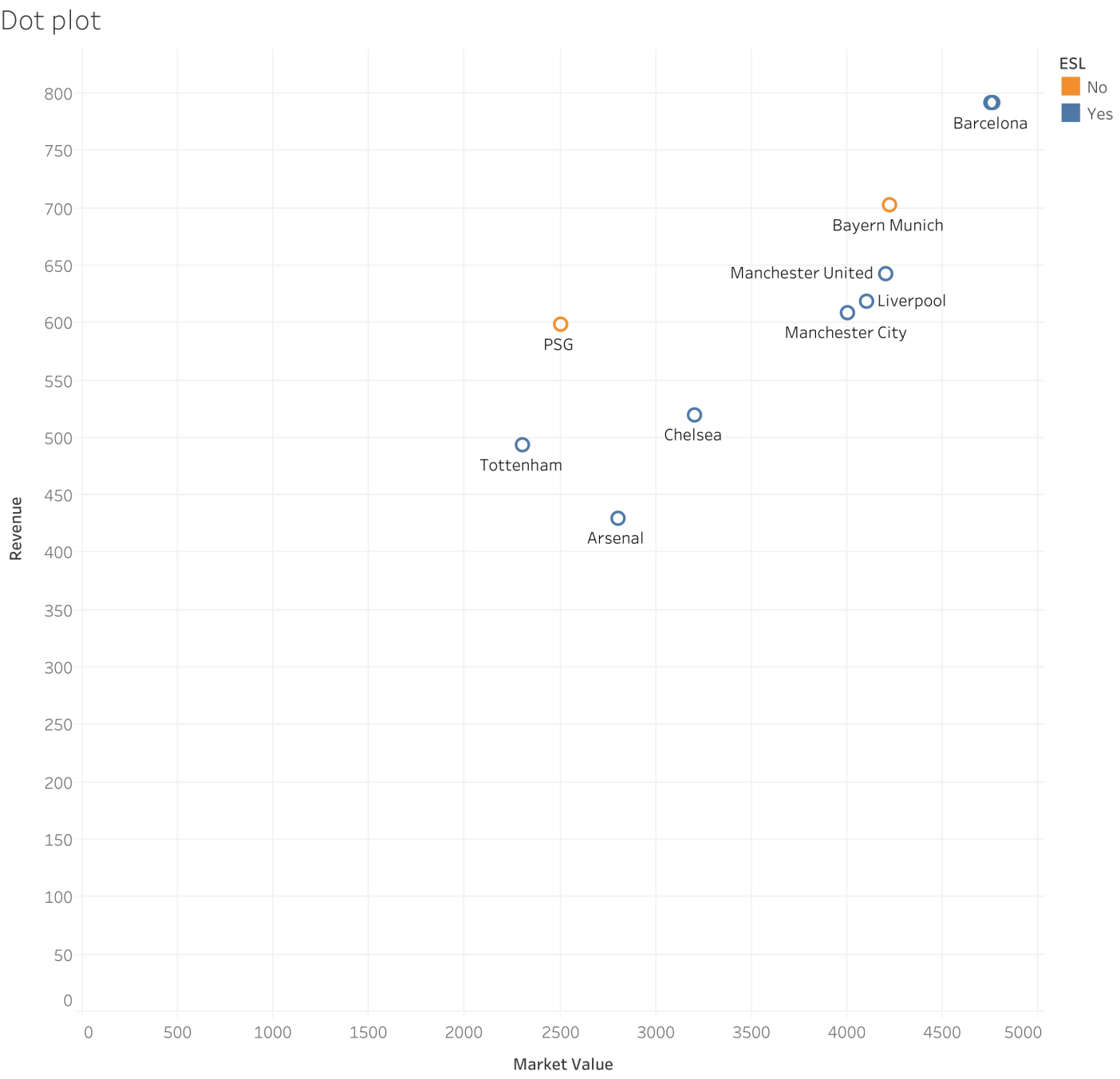
Vertical bar chart



Design schema

Schema	Details
Columns:	SUM(CURRENT_VALUE)
Rows:	SUM(REVENUE)
Graph type:	Shape
Color:	SUPER_LEAGUE
Size:	Default
Label:	CLUB_NAME

Sketch of the resulting graph



Theory

Which one of the following answers is a direct consequence of Steven's law?

- *It is important to avoid comparisons between areas*
- The length of non-aligned objects is harder to compare
- There is no common magnitude assessment for the curvature
- Ordinal measure should be mapped to increasing saturation and intensity
- For every single attribute no more than four distinct levels are discernible