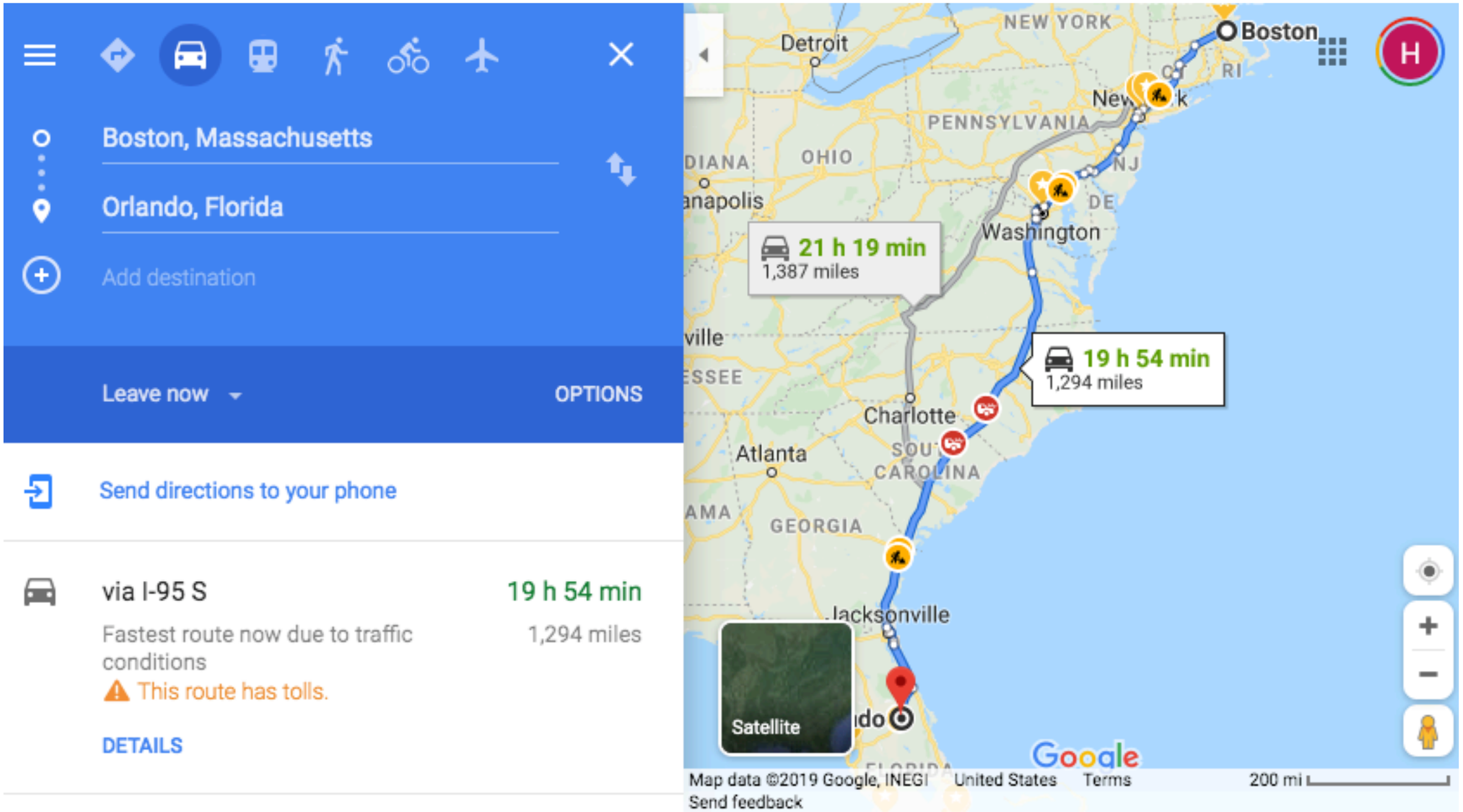
Designing High Impact Data Visualizations

Hong Qu
HKS Communications workshop
November 12, 2019

Math is fun!

Data is everywhere.

How can we creatively and playfully analyze small and large sets of numbers?



Vacation trip data analysis

- Distance
- Distance, length of stay, mode of travel

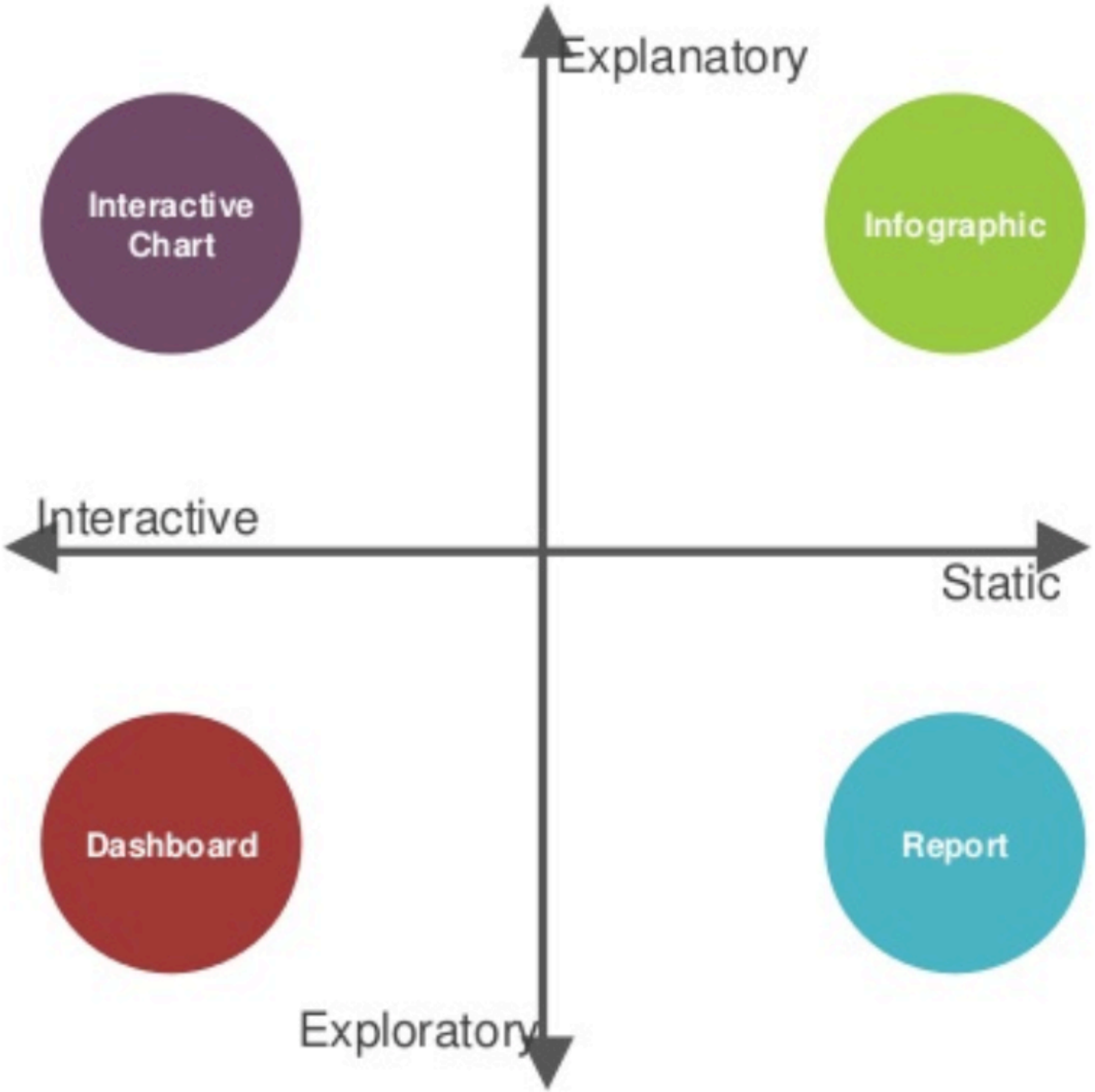
Agenda

- How to communicate with data
- Ways to visualize information
- 5 step process
    - Target <—> Data wrangling <—> Design <—> Implement <—> Evaluate
- Matching the data sets to types of graph
- Pre-attentive perception
- Demos and exercises

“The goal of visualization is to aid our understanding of data by leveraging the human visual system’s highly tuned ability to see patterns, spot trends, and identify outliers.”

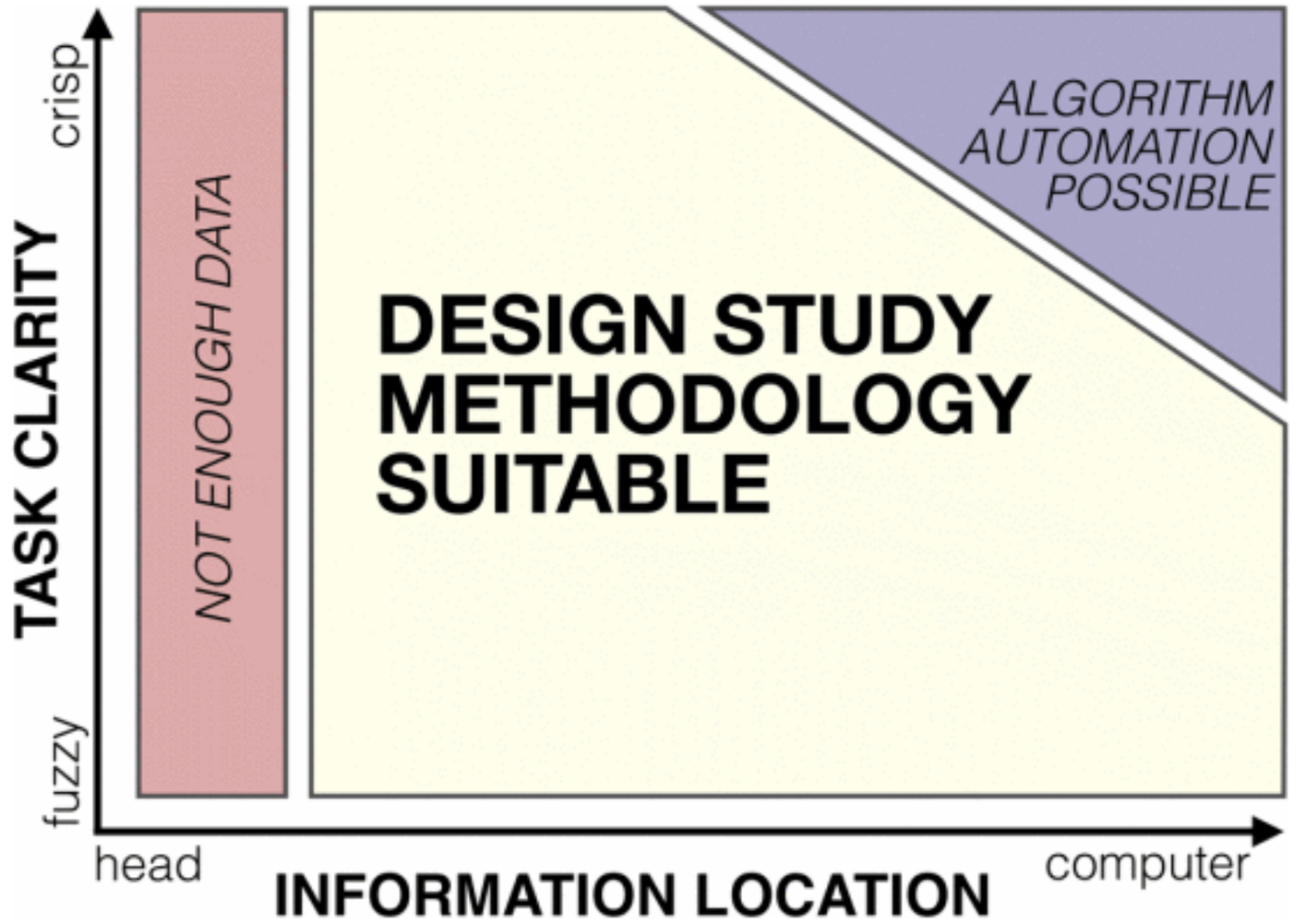
–Jeffrey Heer, Michael Bostock, Vadim Ogievetsky

A Tour Through the Visualization Zoo



Choosing a Data Visualization Tool for Data Scientists

What data should be visualized?

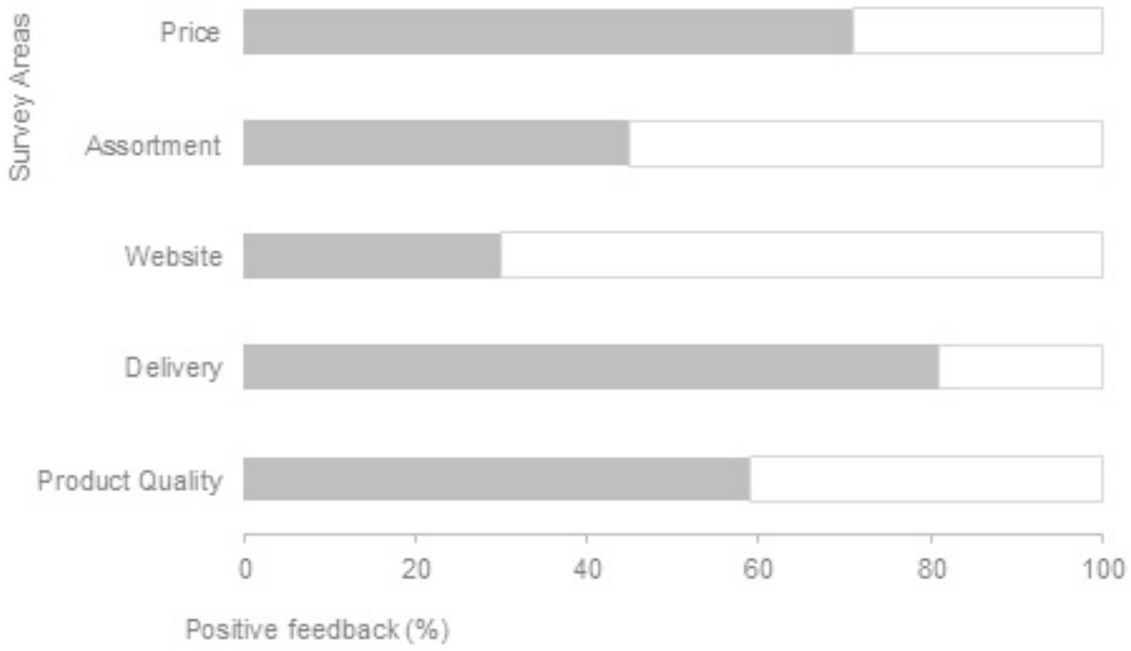


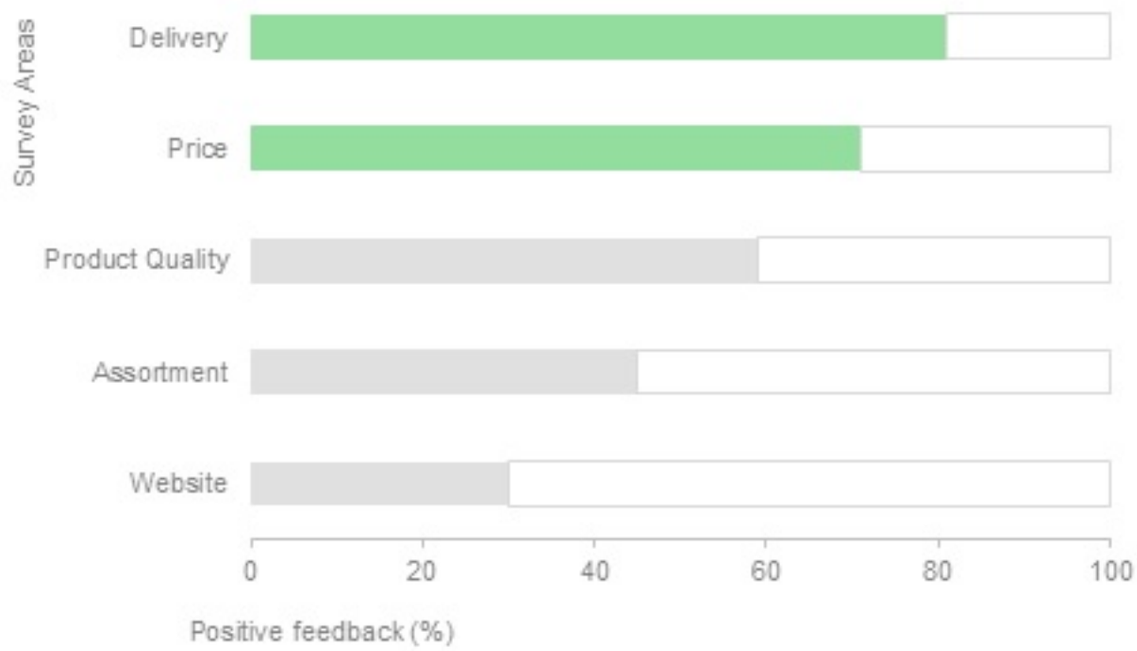
Design Study Methodology: Reflections from the Trenches and the Stacks

5 Step process

Target	Data Wrangling	Design	Implement	Evaluate
choose domain	find and clean data	design visual encoding	rapid prototypes	Do encoding and interaction…
define question	exploratory data analysis	design interactions	define data structures	… answer the questions?
explore existing solutions	transform and summarize data	design layout and storytelling	design system architecture	…provide (new) insights?

Pre-attentive Perception





Preattentive Attributes in Visualization – An Example

Selecting Chart Types

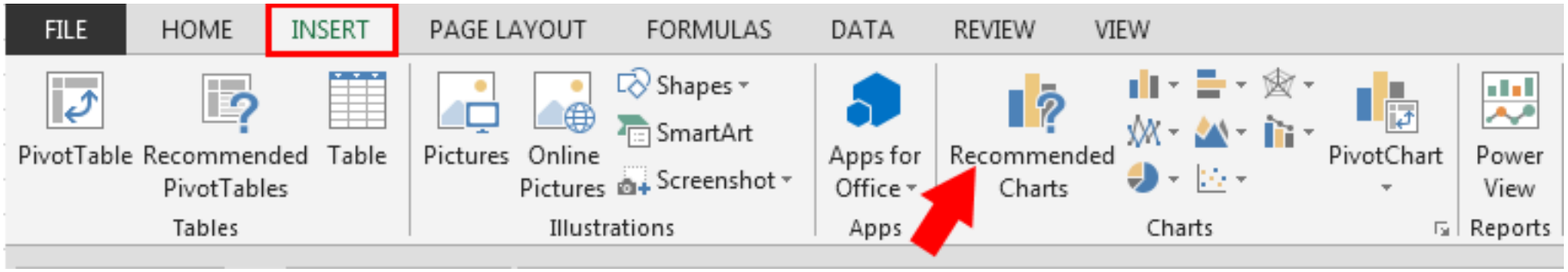
- **Change over time**
- **Category comparison**
- **Ranking**
- **Part-to-whole**
- **Correlation**
- **Distribution**

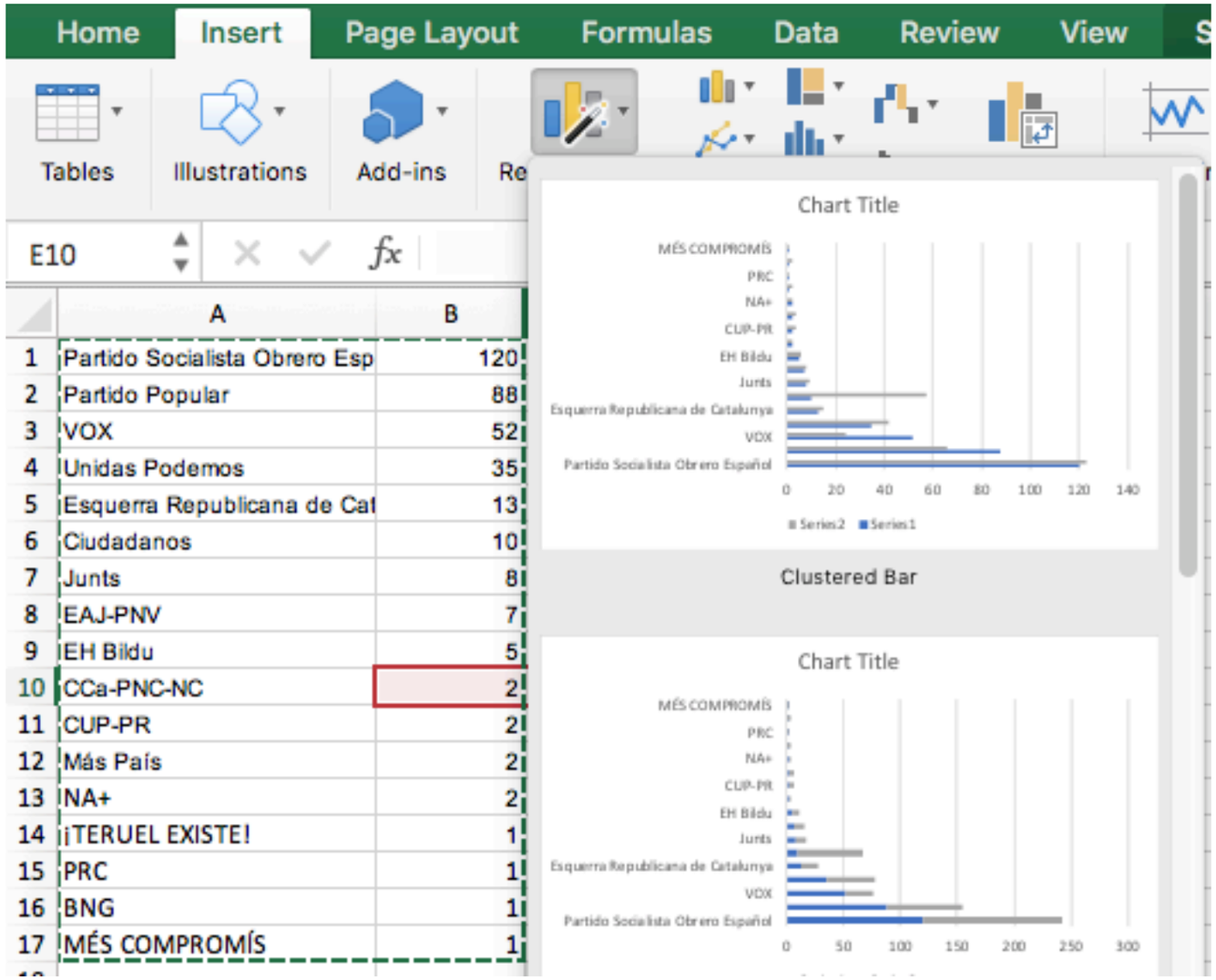
Properties of the data

What you want to convey?

Your audience

Google Material Design: Data visualization





Uses of Recommended charts in Microsoft Excel

Demos

Flourish

http://flourish.studio

- Graph World Bank data
  - GDP
  - Population: static, line animated, bar animated
  - Scatter Plot Population vs GDP
- Election results
  - Spanish election results April and November 2019

DPI-851M: Data and Information Visualization

In This Section

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DPI-851M

This course focuses on building creative and technical skills to transform data into visual reports for the purpose of engendering a shared understanding. Students will learn to use software to ingest, organize, and visualize data, with an emphasis on applying design principles to produce clear, elegant graphs and dashboards that capture the essence of an insight, message, or recommendation distilled from the data.

January 27 to March 13
Mondays and Wednesdays
2:45pm to 4pm

DPI-851M Data and Information Visualization