

# Data Visualization for Decision Making

PGP (1 credit)

**Instructor : Kavitha Ranganathan**

## Objectives

Informed decision making is the foundation upon which successful businesses are built. The amount and complexity of information produced in the business world is increasing at staggering rates. If this data is delivered to you in spreadsheets or tabular reports, it becomes very challenging to find the patterns, trends and correlations necessary to perform your job well. Effective data visualization is an important tool in the decision making process. It allows business decision makers to quickly examine large amounts of data, expose trends and issues efficiently, exchange ideas with key players, and influence the decisions that will ultimately lead to success.

The goal of this course is to expose you to visual representation methods and techniques that increase the understanding of complex data. In this course we will study good design practices for visualization, tools for visualization of data from a variety of fields and visualization software like Processing, GapMinder and Tableau.

## Pre-requisites

Some exposure to programming.

## Evaluation Components

The evaluation is based on class participation (5%), up-to five small individual assignments spread throughout the course (60%) and a final group project (35%). The group project will involve the use of a data visualization software for investigating a substantial data-set of the student's choice.

## References:

*The Visual Display of Quantitative Information* by Edward Tufte ( 5 copies in Library Reserve)

*Envisioning Information* by Edward Tufte (5 copies in Library Reserve)

*Visualizing Data* by Ben Fry ( 10 copies in Library – one for each group)

## Session Details

### Session 1: The Value of Visualization

Readings:

- Business Information Visualization by Tegarden, D. P.. *Communications of the AIS*, 1(4): 1-38. 1999.
- Visual Representation: Implications for Decision Making by Lurie, N.H. and C.H. Mason. *Journal of Marketing*, 71(1): 160-177. 2007.

### Session 2: Effective Use of Form and Space – Fundamentals of Graphs

Readings:

- Graph Selection Matrix
- Seven Common quantitative relationships in Graphs and how to display them

- Save the Pies for Dessert
- Constructing Correlation Bar And Paired Bar Graphs With Microsoft Excel

Ref: perceptualedge.com

### **Session 3: Fundamentals of Tables and Graphs (contd.)**

Readings:

- Graph Selection Matrix
- Seven Common quantitative relationships in Graphs and how to display them
- Save the Pies for Dessert
- Constructing Correlation Bar And Paired Bar Graphs With Microsoft Excel

Ref: perceptualedge.com

### **Session 4: Integrity in Visualization**

Reading : Chapter 2 of The Visual Display of Quantitative Information by Edward Tufte

### **Session 5: Visual Perception and Quantitative Communication**

Reading : Chapter 5 of Envisioning Information by Edward Tufte

### **Session 6: Effective Use of Form and Space – Detailed Design of Tables and Graphs**

Readings: Summary at a Glance: Table Design  
Summary at a Glance: Graph Design

### **Session 7: Detailed Design of Tables and Graphs (contd.)**

Readings: Summary at a Glance: Table Design  
Summary at a Glance: Graph Design

### **Session 8: Additional Constructs and Multivariate Analysis**

Readings : Chapters 4 and 5 of The Visual Display of Quantitative Information by Edward Tufte  
Chapter 1 of Envisioning Information by Edward Tufte  
Reference: <http://tech.fortune.cnn.com/2011/08/15/put-on-your-5-d-glasses/>

### **Session 9 : Escaping 2 Dimensions: Animated Scatter-Plots**

Readings: Instructions for creating Motion Charts in Excel  
References: GapMinder and Google Motion Charts ([www.gapminder.org](http://www.gapminder.org))

### **Session 10: Introduction to Information Design**

Reading: <http://adaptivepath.com/ideas/ben-frys-computational-information-design>

Reference: Processing Software - tutorial (<http://processing.org/learning>)

### **Session 11: Tools for Information Design**

### **Session 12 & 13: Guest session**

### **Session 14: Project Discussion**

### **Session 15: Dashboards for Strategy Visualization**

Reading: *Dashboard Confusion* by Stephen Few :

[http://www.perceptualedge.com/articles/ie/dashboard\\_confusion.pdf](http://www.perceptualedge.com/articles/ie/dashboard_confusion.pdf)

### **Session 16 & 17: Interactive Data Visualization (Lab on Tableau)**

Reference: <http://www.tableausoftware.com/public>

### **Session 18 : Recap of course and Wrap-up**

### **Sessions 19 & 20: Final Project Presentations**