Data Visualization for Decision Making

PGP and PGP-X (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, Mondrian, GapMinder and Tableau.

Pre-requisites

Some exposure to programming.

Evaluation Components

The evaluation is based on class participation (5%), up-to fivesmall 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 BenFry (10 copies in Library – one for each group)

Session Details

Session 1: The Value of Visualization

Readings:
- Business Information Visualization by Tegarden, D. P..*Communicationsof the AIS, 1*(4): 1-38. 1999.
- Visual Representation: Implications forDecision 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/

Session9:Escaping 2 Dimensions: Animated Scatter-Plots

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

Session 10: Exploratory Data Visualization – I

Reading : Introduction to Exploratory Data Visualization
(www.itl.nist.gov/div898/handbook/eda/eda.htm)

Session 11: Exploratory Data Visualization – II

Reference : Mondrian: a statistical data-visualization system for interactive data visualization
(http://rosuda.org/mondrian)

Session 12: Introduction to Information Design

Reading: http://adaptivepath.com/ideas/ben-frys-computational-information-design
Reference: Processing Software - tutorial   (http://processing.org/learning)

Session 13:Tools for Information Design

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

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