

Amrita University MBA Programme Amritapuri Data Management and Visualization

Introduction This course introduces the basic concepts of data analytics for understanding the importance of collecting, validating, managing and presenting data. The course helps to lay strong foundations on the tools and techniques for data management and visualization and aims to integrate them with those from allied management disciplines.

Data management includes all aspects of data planning, handling, analysis, documentation and storage, and takes place during all stages of a study. The objective is to create a reliable data base containing high quality data. Data management is a too often neglected part of study design and includes:

- Planning the data needs of the study
- Data collection
- Data entry
- Data validation and checking
- Data manipulation
- Data files backup
- Data documentation

Each of these processes requires thought and time; each requires painstaking attention to detail. The main element of data management are database files. **Database files** contain text, numerical, images, and other data in machine readable form. Such files should be viewed as part of a **database management systems (DBMs)** which allows for a broad range of data functions, including data entry, checking, updating, documentation, and analysis.

Visualization Data visualizations, also known as data graphics, can be best explained by quoting Edward Tufte: "Data graphics visually display measured quantities by means of the combined use of points, lines, a coordinate system, numbers, symbols, words, shading, and color."

A common misconception is that data visualizations are the same as information graphics (infographics). It is important to understand that data visualizations always communicate a message by visualizing quantifiable data objectively, while infographics can be used to communicate any information at all (usually with a specific goal); regardless of whether it is quantifiable or not.

Creating a data visualization is more than simply translating a table of data into a visualization. Data visualizations should communicate data in the most effective way; to truly reveal the data they should be quick, accurate, and powerful. Creating visuals can easily summarize and communicate data to other people - making even the largest or most complicated sets of data understandable.

Teaching Methods The classroom activity will consist of lectures and case discussions. Individual/Group assignments and presentations will complement the classroom discussions in enhancing the understanding of the subject.

Expectation from the Students

The students are expected to prepare well in advance from the relevant references assigned before attending the sessions to make the classroom activity more meaningful and fruitful. Each student is expected to possess a copy of the prescribed textbook.

Your submissions related to assignments, case studies and projects should be emailed to: **sureshasbam@gmail.com**

Attendance Class attendance is required and there is no substitute for missed sessions. More than **two** absences will attract penalties in the class participation component of evaluation. ASB policy on attendance will be applicable for the duration of the course.

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Evaluation Scheme

Component Weightage (in %)

Attendance 10 Assignments / Quizzes 10 Class Participation / Case discussions 20 Midterm exam/Term Paper 25 Endterm exam 35

Textbooks and Reference

1. Friendly, M. (2004) A brief history of Data Visualization York University Canada.
2. Laumans J., An introduction to Visualizing data
3. Fry B, Visualizing Data ebook
4. Iliinsky, N. and Steele, J. Designing Data Visualizations O'REILLY e book
5. Hammond, R. From Data Management to Data Analysis to Visualization, [www.online mag.net](http://www.online-mag.net)
6. Myatt, J.G. and Johnson, W.P, Making Sense of Data I A Practical Guide to Exploratory Data Analysis and Data Mining
second edition,
Wiley
7. Tufte, E, R., The Visual Display of Quantitative Information

8. Gavett, G 2014 How Data Visualization Answered One of Retail's Most Vexing Questions, **Harvard Business Review**, May 2014 Issue <https://hbr.org/2014/05/how-data-visualization-answered-one-of-retails-most-vexing-questions>, 9. Berinato, S. 2016 Visualization that really work **Harvard Business Review**, June 2016 issue <https://hbr.org/2016/06/visualizations-that-really-work> 10. Franks, B. 2013 The value of a good visual immediacy **Harvard Business Review**, March 2013 Issue <https://hbr.org/2013/03/the-value-of-a-good-visual-imm>

11. Thorp, J. 2013 Telling Stories with Visual Data A glimpse into the future of narrative **Harvard Business Review**, April 2013 <https://hbr.org/2013/04/telling-stories-with-visual-da>

12. Aral, S., To go from big data to big insight, start with a visual **Harvard Business Review**, August 2013 Issue <https://hbr.org/2013/08/visualizing-how-online-word-of>

Videos 1. The best stats you've ever seen | Hans Rosling

<https://www.youtube.com/watch?v=hVimVzgtD6w>

2. The beauty of data visualization - David McCandless <https://www.youtube.com/watch?v=5Zg-C8AAIGg> 3. The Art of Data Visualization | Off Book | PBS Digital Studios <https://www.youtube.com/watch?v=AdSZJzb-aX8> 4. I Like Pretty Graphs: Best Practices for Data Visualization Assignments https://www.youtube.com/watch?v=pD_OvRtH0aY 5. Talk Data to Me: Data Visualization Best Practices <https://www.youtube.com/watch?v=GnMSjSWDQnk> 6. Designing Data Visualizations with Noah Iliinsky, <https://www.youtube.com/watch?v=R-oiKt7bUU8>

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SESSIONS PLAN

Session # Topic Reading Chapter

1 Introduction Course content and expectation Video 1

2 Foundation

Concepts

Data Visualization and Management Page 3 Making sense with Data 1 (Discussion on the descriptive statistics, measures of central tendency, deviation) Reading 6 3 Foundation

Concepts

Making sense with Data 1 (Discussion on the descriptive statistics, measures of central tendency, deviation)

Reading 6

4 History of Data

Visualization

A Brief History of Data Visualization, Michael Friendly Psychology Department and Statistical Consulting

Service York University, Toronto, Canada Chapter in Handbook of Computational Statistics: Data Visualization.
Reading 1

5 Introduction to
Data Visualization

An introduction to VISUALIZING DATA by Joel Laumans Reading 2 4 An introduction to VISUALIZING

DATA by Joel Laumans Reading 2 5 Visualization that really work Reading 9 6

Introduction to Tableau

Installation of Tableau and Introduction to Tableau Interface 7 Functionalities : Dimensions, Measures 8 Data
Types, Cleaning and formatting data 9 Data connection with Tableau Interface 10 Combining Datasets 11
Sorting, grouping and filtering 12 Logical functions, Analysis Tab

Mid Term Examination (Term Paper)

13

Tableau basics

Formatting and Annotations 14 Spatial Analysis and Geo Coding 15 Calculation Field, Look up functions 16

Using Parameters Dashboards 17

Tableau in action

Connecting with Tableau Online, Tableau Server and Mobile App 18 Connecting with Tableau Online, Tableau
Server and Mobile App 19 Connecting Tableau to Google Analytics and Facebook Analytics 20 Motion Charts

21 Tableau Server Configuration, Installation, Authorization, Permission,

Security

22 Project Presentation

23 Project Presentation 24 Wrap up session