

## **Teaching Case on Business Intelligence: Student Comments and Lessons Learned**

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### **ABSTRACT**

This is a graduate level course in DSS, which emphasizes data warehousing, and business intelligence. Students are engaged in critically assessing the academic and business/trade literature and for developing the necessary analytical skills for interpreting business data. Student comments are assessed and presented. The lessons learned suggest less emphasis on academic literature and more of practical data analysis

Key words: Business analytics, lessons learned, insights.

### **Introduction**

Business intelligence has come a long way from its beginnings. It is now almost standard practice in most fortune 500 companies. However, it is still not very well understood. Is it a database or is it a statistical software package or both? The objective of this graduate course in Decision Support Systems for Managers (MIS-648) is multifaceted.

Decision Support Systems (DSS) represents a point of view on the role of the computer in the decision-making process. Decision support implies the use of computers to: assist managers in their decision processes; support rather, than replace managerial judgment; and improve effectiveness of decision making rather than just its efficiency. The course will focus on business intelligence and data warehousing how they can be used to improve the quality of management decisions. There are two sets of objectives. The first set involves understanding the academic and business/trade literature in conjunction with the basic issue of the student's organization. The second set is the skill set to organize and analyze the business data to make the best decisions.

### **Course Objectives**

The overall objectives are as follow:

- To develop skills to critically analyze business problems
- To understand how the organization's structure, strategy, and practices change with technology
- To develop ability to make effective presentations
- To develop analytical skills to solve business problems
- To develop familiarity and competence with business software packages
- To understand the varied use of technology within the business context
- To recognize when information is needed, locate it efficiently, evaluate its relevance, authoritativeness and validity, use it to build new knowledge, and communicate that knowledge.

### **Objective set 1**

This portion of the course requires that the students read, analyze, interpret, and discuss the academic and the business trade literature.

The course begins with lectures and presentation on decision support systems and business intelligence with the aid of a text by Sharda, et.al. [3] and research articles by Nemati, et. al. [2]. Each week there is a lecture based on one of the text chapters using the provided or enhanced PowerPoint slides. Additional presentations are on justifying BI, usability, cloud computing and others. Videos are provided either through Teradata University or other sources and several business professional guest lectures have agreed to come and present. This is an interactive class where the students are engaged right into the learning activities.

The students prepare discussions initiatives based on [2], [1] and others. This gives them the ability to critically assess the academic literature. The students are encouraged to support their comments, opinions, and arguments with course materials and with other academic and business/trade literature.

Initial

1. What is the motivation behind the paper (the research question(s))?
2. What is the value/contribution of the paper?
3. Course integration
4. Critique and Assessment
5. Lessons learned

Students then comment on others initial analysis and add value with additional supporting course or library literature.

This set of exercises prepares the student to do a detailed review of a paper of their choice from Decision Support Systems. The student prepares a report and class presentation.

## **Objective set 2**

This portion of the course requires that the students learn to prepare data and interpret it. First on their own and then in teams. There are two individual data assignments, followed by the team assignment. The team assignment requires integration of the data with Excel, Access, SPSS, and two of the BI tools.

Individual data assignment 1: Data Preparation

This assignment prepares the student for critically analyzing business data. The student first needs to obtain data that they are familiar with (data from their organization) or use a data set that is provided by the instructor (Major League Baseball, MLB, or other data sets). The data is supplied in Excel or text format. The student must the convert to Excel and interpret the independent and dependent variables. In many case they must clean the data. The students are also required to create a CSV file and load the data in to Access and run several queries.

Moving and preparing Data- from Excel or Access to SPSS.

- Show the Excel data set (one page)
- Show the import into SPSS

- Use the software package to label and describe the data
- Show appropriate graphs and charts
- Show a crosstab

#### Initial analysis

Following from the initial data workup the students load the data set into SPSS. There assignment is then to run several descriptive and inferential procedures (from frequency distribution to crosstabs to regressions). The student has now demonstrated that he/she can manipulate and analyze business data set.

#### Individual Data Assignment 2: Analyzing the data- Submit in class a hard copy

- Compare two of the independent variables
- Run a t-test
- Run an analysis of variance
- Run a regression
- Run a Chi-Square

#### Team Assignment: Business Intelligence Analysis

This last assignment is a team project consisting of 3 to 4 students. The student teams' can continue with one data set or use another more complex data set. They are to create Excel, Access, and SPSS sets and then prepare for BI. There are three parts to this assignment: define the problem, build a model in Excel and SPSS, build a model in two BI tools.

The course is fortunate enough to have access to three business intelligence platforms: Cognos Personal Insight, Tableau, and Microsoft Power BI. In addition Cognos 6.5 is used for demonstration purposes. The students are required to select two of the BI products to develop applications based on their data. The students are then responsible for:

**Part I:** Define the problem. Develop a proposal (Justification, Benefits, Integrate with course material and other internet and academic research material)

**Part II:** Build an Access and or Excel model. Build an SPSS data model. Show queries in either Access or Excel and SPSS. What are the Attributes, Independent, and dependent variables? What are the dimensions of the model?

**Part III:** Build the BI model, write the report and PowerPoint Presentation; Present in class. Implement the system using software using two BI tools. Graphs, charts, diagrams, tables, flow charts, pictures and drawings are welcome. This can be a real system or a potential system.

#### Student Comments

The student comments are presented in Appendix 1. The column headings an inclusive list developed by the instructor. Students are not required to answer the entire set of questions, hence the blanks on the appendix 1. Each row represents the comments from a student. The basic summary suggests that in general the students were very favorable towards the course. They commented that the course added value in terms of “real world” business value. Many students suggested that they gained an

understanding of business intelligence. Many students suggested that BI was fairly easy to learn the software (SPSS, Cognos, and Tableau). Other struggled a little and wanted more tutorials.

### Insights

The students do not understand data. Data is new to them. The students know that their organizations are moving towards data analysis and this is a course in data analytics. They are surprised at first about what data is; the course transitions from Excel (and csv files) to SPSS and to the BI software. The students see that this is seamless and not “scary” or difficult at all. The students were able learn that the data “flows” from Excel through SPSS to the BI tools.

### Conclusion

This is an interactive graduate level course on decision support systems for managers, which focus on data warehousing and business intelligence. The course has evolved over the years from decision support to interactive BI. The students were favorable about the course structure and they felt that they learned a significant amount on BI and analytics.

### References

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**Appendix 1**  
**Student Comments on the Course**

Course Benefits	Software	Academic Papers	Teaching
Foundation for making better strategic decisions	Utilize tools to better	The papers discussed to be extremely helpful	Step by step how to use SPSS and COGNOS in class
Learned new software that can utilize; added value to what I do for work		DSS article research-very important	Very helpful in showing us the new software
Course is challenging and very informative	Cognos and Tableau has definitely added value to this course	Articles and the discussions proved to be very helpful	Experience helped us understand what the industry is expecting and made us feel a lot more comfortable in class.
Tools used for the course are interesting and have real world application	SPSS, Tableau and Cognos are valuable tools especially when pursuing a career in Business Intelligence		Structure of the course was also helpful
The course does a good job at showing how large amounts of data can be presented in a variety of different formats and how it can be translated/interpreted using different software to properly analyze it	Began using BI in both my full-time job and my freelance work, and it has had a positive effect in both scenarios		Data assignments and the team project provides an excellent opportunity to use real world data
Taught me how to utilize tools to better analyze big data,	Step by step how to use SPSS and COGNOS		I can add SPSS and COGNOS experience into my resume right now. It is a big value adding.
To gain a very strong understanding of Business intelligence and even decision making processes		The articles provided gave a substantial amount of depth to Business intelligence studies	
course taught us some practical skills	Cognos and Tableau is very good for the entire course		Help us to have more in-depth understanding of BI areas.
Great hands-on way of becoming familiar with various data analysis	SPSS, Tableau, and Cognos		
This course tied in the data gathering, analysis, and			Approachable and is able to provide good

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Course Benefits	Software	Academic Papers	Teaching
interpretation elements from a business intelligence perspective.			assistance in approaching course concepts.
The course is a good introduction to data analysis/data mining, and how to affectively use the tools that help further understand the collected data. The material covered in class offers an in depth view of data analysis			The real-world examples provided allowed me to further grasp the course material
Very good aspect of the class is how closely it related to my work			
			I truly learned something that I can use to apply to my real life unlike other class
The course is very informative and the professor very knowledgeable			
	The course should focus on teaching SPSS and COGNOS throughout the course		
	More practical examples on how to use SPSS, Tableau and Cognos. It would be nice to introduce ETL tools like Informatica		
			It would be helpful to have pre-recorded videos of you using the software that relates to your uploaded data sheets