

# **TOWARDS A RELEVANT BUSINESS INTELLIGENCE EXPERIENCE: ENHANCING THE DATABASE KNOWLEDGE OF MIS GRADUATES**

*Ben Snow, Huntsman School of Business, Utah State University, 3500 Old Main Hill, Logan, UT 84322,  
b.snow@aggiemail.usu.edu*

*Michael Black, Huntsman School of Business, Utah State University, 3500 Old Main Hill, Logan, UT  
84322, m.r.black@aggiemail.usu.edu*

*Vance Cooney, College of Business and Public Administration, Eastern Washington University, 668 N.  
Riverpoint Blvd. Suite A, Spokane, WA 99202, vcooney@ewu.edu*

*David Olsen, Huntsman School of Business, Utah State University, 3500 Old Main Hill, Logan, UT  
84322, david.olsen@usu.edu*

## **ABSTRACT**

Companies are increasingly relying on business intelligence and analytics for decision making. However, BI teaching in universities has still not increased to meet this need in the market. In this paper, we offer a BI teaching module, designed to introduce students to the basic principles of BI as well as hand-on experience with Microsoft Visual Studio, using the Analysis Services and Reporting framework. This module is intended to give students a relevant introduction to BI, providing them with a springboard for to expand their BI knowledge.

## **INTRODUCTION**

Business intelligence (BI) has been defined as computer-based techniques used in spotting, digging-out, and analyzing business data, such as sales revenue by products and/or departments or associated costs and incomes [1]. BI practices continue to evolve and provide businesses in many sectors with increasingly powerful tools and information for decision making. Increasing amounts of information available to companies need to be harnessed and interpreted. Companies ranging from IBM to the United States Postal Service have recorded measured improvements to business processes and decision making by implementing BI technologies [4].

As BI is becoming more active in industry, more and more money is being allocated to BI projects, even in hard economic times. A 2007 Gartner survey of 1400 CIOs found that "BI projects were the number one technology priority for 2007. [9]" Given these facts, it is argued that today's business graduate (and especially MIS graduate) must be exposed to BI concepts and practices during the course of their study. In 2008, Hugh Watson stated that "Business Schools Need to Change What They Teach [8]" in order to prepare graduates for a changing business landscape. Watson claims that business schools have been slow to adopt BI courses and emphases and explains that graduates must have some exposure to both BI concepts and technologies. Watson is not alone in his call. Conway and Vasseur [2] feel that current business programs do not provide adequate exposure to BI solutions to support planning, reporting and analytics.

While BI teaching is gaining ground in academia, some professors and educators still feel that "BI is still not mature enough or covered as well as other topics or areas in IS" [10] and that business and IS degrees need to focus more on BI as a utility in "areas like marketing, finance [and] insurance [10]."

Many MIS degrees still lack focused applications of BI principles.

In order to enhance the database and BI knowledge of MIS graduates, we propose a BI classroom module, designed to introduce students to BI and help them understand the need for BI in today's business climate. Students will also be introduced to the difference between relational databases and a data warehouse, as well as dimensional modeling concepts. Using Microsoft Visual Studio, the Analysis and Reporting Services framework and the sample AdventureWorks database, students will then be guided how to build, deploy and glean data from a data cube. The AdventureWorks database is a fully functional and robust sample database provided by Microsoft. By providing opportunities for students to learn BI concepts and practices, students can gain powerful tools to supplement their skills.

## **LITERATURE REVIEW**

Watson and Wixom [9] state that "BI is emerging as a key enabler for increasing value and performance . . . the future of business intelligence is bright." We take this to mean that BI will continue to provide businesses with relevant and key information for decision making. IBM, 3M and SAP are among many companies that are increasing their BI investments as other companies turn to dashboards and scorecards for improving business metrics and decision making [9]. In 2007, 3M justified a multimillion-dollar investment in a data warehouse platform due to savings from data mart consolidation. Inmon [3] explains that data warehousing and BI have greatly enhanced business processes, i.e. frequent flyer programs, credit card fraud analysis, inventory management and customer profiles.

Companies such as Novo Nordisk, Brother International and the United States Postal Service have greatly improved their reporting and key performance indicator metrics by implementing BI strategies [4]. Healthcare provider Novo Nordisk has defined key performance indicators (KPIs) and implemented company-wide access to performance metrics and data, thereby enabling more informed decision making. Brother International implemented business analytic tools to support customer service representatives, resulting in savings of half a million dollars per year and a 32% ROI. The United States Postal Service (USPS) boosted the performance of its retail outlets by installing a Retail Data Mart "to capture transaction data from a networked point of sale source system." This system has provided USPS with the ability to drill down to specifics on regions, and even individual outlets, resulting in a 1,377% ROI.

BI has enabled the Richmond Va. police department to nearly "predict" when and where crimes will occur and helped allocate resources accordingly [7]. Shift supervisors have access to detailed information at the beginning of their shift as well as real time alerts from the system when a crime pattern is detected. BI tools have enabled the Richmond Va. police department to be proactive rather than reactive in fighting crime. Internationally, Ming Ya Insurance in China has found benefit by implementing business intelligence systems [11]. As the life insurance industry in China faces great challenges during a time of change, Ming Ya has used data mining, data warehousing and meta databases to help determine the average amount customers are willing to pay for insurance consulting, as well as reduce the number of sales visits required before closing a sale.

The key success factor for any enterprise is making sense of and harnessing the massive amounts of information flowing in and across the business [6]. Given the increasing emphasis on BI in many business sectors, it follows that MIS graduates understand at least basic BI principles if they are to use these principles to benefit business industries.

## METHODS

This module is designed to be taught during one or two 75 min. class periods. Students will ideally have prior knowledge of conventional relational database principles. The module content will be presented using Gagne's Nine Events of Instruction as a learning framework [5]. For reference, the events are listed below:

Gagne's Nine Events of Instruction:

1. Gain Attention
2. Inform Learner of Objectives
3. Stimulate Recall of Prior Learning
4. Present Stimulus Material
5. Provide Learner Guidance
6. Elicit Performance
7. Provide Feedback
8. Assess Performance
9. Enhance Retention and Transfer

Our approach is designed to be a hands-on, business relevant approach in order to reinforce the principles taught.

## MODULE DESCRIPTION

As stated in the above section, teaching of the module will be based around Gagne's Nine Events of Instruction.

### 1. Gain Attention

Instructors will conduct a short discussion surrounding the increasing amounts of data in today's world and how BI can help distill this data and provide real value.

### 2. Inform Learner of Objectives

Students will be informed of the following objectives:

Understand the need for BI given ever increasing amounts of data

Understand the difference between data warehousing and traditional model relational model

Know how to identify a fact and dimension

Design and deploy a cube in Visual Studio

Demonstrate ability in rotating the cube and finding answers to several sample questions based on the AdventureWorks database.

Develop students' own questions and work with a classmate to find the answers

### 3. Stimulate Recall of Prior Learning

Students will be asked to recall and explain what they know about the relational model with regards to table design and keys.

### 4. Present Stimulus Material

The instructor will then discuss how the relation model differs from data warehousing as well as present general data warehousing terms and design principles. Following this introduction, students will follow instructions for creating and deploying a cube. The instructor will also briefly describe the business model and implications of the AdventureWorks database.

#### 5. Provide Learner Guidance

The process of creating and deploying the cube will be displayed on a projector, providing students with both audio and visual assistance as they setup the cube.

#### 6. Elicit Performance

The instructor will then pose several relevant business questions based on the data provided, i.e. What is the sales amount for Europe area in 2008? In the Browser area of Analysis Services, students will try to discover the answer by dragging a fact and dimensions onto the appropriate axes.

#### 7. Provide Feedback

The instructor will be available to answer any questions or problems students encountered while finding the answer to the questions posed.

#### 8. Assess Performance

The instructor will administer a short oral quiz, designed to test students' knowledge of topics and principles discussed to this point.

#### 9. Enhance Retention Transfer

Students will then be given several minutes to develop their own questions based on the AdventureWorks data. After they develop their questions, students will divide into pairs and quiz their peers. This activity is designed to get students creating and applying the knowledge they've acquired to this point. The instructor will be on hand to answer questions/help students find desired answers.

### **ADVANTAGES TO THIS APPROACH**

Gagne's Nine Events of Learning offers a structured approach to teaching. By basing our teaching on Gagne's Nine Events, we believe students learning will be enhanced and better retained. We believe a hands-on activity will provide students with a base to build off as they expand their BI knowledge. The AdventureWorks DB offers a fully populated and relevant data set that students can tie to real world examples.

### **CONCLUSION**

As BI continues to move forward, providing business with cost savings and increased metrics and analytics, MIS students must be familiar with basic BI principles and implementations if they are to help businesses succeed using BI. While there may exist many reasons for the BI teaching gap at the university level, it is clear that further progress needs to be made in order to promote BI teaching. This paper offers an insertable module covering key competencies and principles, designed to facilitate BI teaching inclusion, benefiting both students and professors alike. This paper represents a preliminary venture and we look forward to conducting further research on this topic. In addition, we call for future research on this topic and submit our research as means of promoting the same.

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