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ABSTRACT

Business intelligence became a standard part of undergraduate and graduate curricula in recent years. Faculty are challenged with staying abreast of this evolving topic and teaching it in relevant ways. The latest enhancement to the Teradata University Network (www.TeradataUniversityNetwork.com) is the addition of software from a leading business intelligence vendor. The website now offers MicroStrategy Web (an interactive environment for business reporting and analysis, which provides ad hoc querying and analysis capabilities) and a variety of MicroStrategy analytic software modules that focus on analytics for specific business processes. It is available for hands-on use by students. This tutorial describes these business intelligence resources and provides several ways in which the resources can be used to create effective classroom experiences. The resources are available to all faculty and students at no cost by registering with the Teradata University Network.

Keywords

Business intelligence, data warehousing, data management, classroom software, pedagogy.

INTRODUCTION

Business intelligence became a standard part of undergraduate and graduate curricula in recent years. Faculty are challenged with staying abreast of this evolving topic and teaching it in relevant ways. A few years ago, Teradata, a division of NCR, teamed with a group of academics in the field of data management, and together they created the Teradata University Network (www.TeradataUniversityNetwork.com), a free learning portal designed to help faculty teach and learn about business intelligence, data warehousing, and data management topics (Watson and Hoffer 2003).

A recent addition to this learning portal is information and software from one of the industry-leading business intelligence vendors, MicroStrategy. This enhancement to the Teradata University Network was created to help professors better teach the topic of business intelligence and to help students experience software that is widely used in practice. The resources that MicroStrategy offers can be used in a variety of ways. The purpose of this tutorial is to help instructors understand the MicroStrategy resources that are available to them and to provide ideas for incorporating them into classroom experiences. This paper begins by describing MicroStrategy and the business intelligence resources available on Teradata University Network. It then presents several examples of ways in which the resources can be used.

MICROSTRATEGY

MicroStrategy is one of the industry-leading business intelligence vendors, founded in 1989 and headquartered in McLean, Virginia. The company's more than 2,300 customers include Bank of Montreal, Best Buy, and AT&T. It works with over 500 technology and integration partners, including Teradata, PeopleSoft, Hewlett-Packard and JD Edwards (www.microstrategy.com 2004). MicroStrategy became famous for selling the first relational on-line analytical processing (ROLAP) software platform and is considered quite innovative by the business intelligence industry. MicroStrategy was first to market with various business intelligence capabilities, such as the ability to broadcast messages to users based on predetermined business events.

MicroStrategy Web is the company's flagship product. It is an interactive environment for business reporting and analysis, which provides ad hoc querying and analysis capabilities. MicroStrategy Web is an HTML-based tool through which users can manage and manipulate data in an open environment.

MicroStrategy also offers a variety of analytic software modules that focus on analytics for specific business processes. The *customer analysis module* focuses on the analysis of customer-centric information. This includes point of sale data, demographic, and customer history information. Areas of analysis include customer segmentation, profitability, cross-sell, and loyalty. The *financial reporting analysis module* provides in-depth analysis of financial information captured by general

ledgers, actuals, commissions, and forecasting systems. Areas of analysis include accounts payable, accounts receivable, balance sheet, profit and loss, expenses, and forecasting. The *sales analysis module* focuses on information captured during the sales process, including data from sales force automation, point of sales, and sales operations systems. Areas of analysis include leads, pipeline, product, and sales performance.

MICROSTRATEGY RESOURCES

MicroStrategy made a variety of resources available for instructors via the Teradata University Network. The same resources are available to students using the companion site, Teradata Student Network (www.TeradataStudentNetwork.com). To access the latter site, students login using a password provided by the instructor. This password is changed twice a year, and the current password is available to the instructor on the Teradata University Network.

The MicroStrategy resources can be classified as informational, product, or support.

Informational Resources

Informational resources are available to help instructors learn about MicroStrategy, its products, and issues related to the field of business intelligence. The first informational resource is a link to the MicroStrategy company home page ([www.microstrategy.com)](www.microstrategy.com). Here, you can gather information about MicroStrategy the company and all of the products that the company sells. You can sign up to receive free evaluation software, enroll in free online seminars and classes, subscribe to an electronic newsletter, watch an online demo, and access white papers. The MicroStrategy company home page is a useful supplement to what is available on the Teradata University Network.

A second informational resource is product documentation in a .pdf file. You can access MicroStrategy 7*i* product manuals, reference materials, and setup guides. The third informational resource available includes links to the white papers section of the MicroStrategy Website. These white papers, authored by MicroStrategy professionals and other industry experts, provide insights into the world of business intelligence.

Product Resources

The MicroStrategy Web product is available via a tutorial reporting application. The application provides a project and application set designed to illustrate the platform's functionality. The theme is an Electronics, Books, Movies and Music store scenario to analyze Employees, Inventory, Finance, Product Sales and Suppliers. You can interact with the application in two ways. First, you can interact with it freely, testing out design, reporting, and other capabilities in an ad hoc way. You also can follow the tutorial script, which is a .pdf file that illustrates the basic functionality provided by MicroStrategy Web and includes exercises to test your knowledge.

Another product resource is eTrainer, an on-line tutorial that teaches you about using MicroStrategy Web and tests your knowledge. It combines expert instruction with real product simulation, a user-friendly interface, and interactivity, to form a complete hands-on way to learn about MicroStrategy Web. The 23 lessons have interactive tests so that you and your students can test mastery of the lessons.

Support Resources

At times, instructors may need help, or they may need to answer student questions about the available resources. In these situations, instructors can contact experienced Teradata Customer Service Representatives. The website provides 24-hour incident reporting, and specific details on the process and how to report an incident are available on the same web page as the resources described earlier. Instructors also are welcome to contact any of the Teradata University Network Advisory Board members, and they will try to provide direction.

WAYS TO USE BUSINESS INTELLIGENCE RESOURCES IN CLASS

This section describes some of the many ways instructors are using the available resources in the classroom. When teaching about business intelligence, you may want to consider 1) general demos; 2) hands-on experiential learning; 3) scenario-based assignments; and 4) research projects. Each is now presented.

General Demos

A traditional approach may be appropriate for lecture-based classes that seek to communicate to students what business intelligence software can do, what a typical interface looks like, and how a user can interact with a business intelligence tool

to solve business problems. In a lecture-based class, you may want to consider performing a demo in which you navigate through the MicroStrategy Web product on a screen in the front of the classroom. The tutorial application and script can be used; whereby, the instructor first reads the tutorial script and then applies portions of it that seem interesting. An instructor with some experience with MicroStrategy may want to skip the tutorial script and instead manipulate the tutorial application in an ad hoc fashion. Either way, the objective would be to show a variety of MicroStrategy Web capabilities that a typical analyst would use in his or her daily tasks.

Usually, 15-20 minutes of the demo can show the minimal amount for students to get the basic idea of what a business intelligence environment is like. Some prefer to take an hour or an hour and a half with the demo, which is an approach that leaves students with a great understanding of how analysts really work with the software. Either way, the instructor can combine the demo with an overview of MicroStrategy and an overview of business intelligence. The company website provides information to create slides covering the former topic, and the latter topic can be researched using some of the business intelligence articles and research reports posted on Teradata University Network, such as Eckerson (2002) and Eckerson (2003). Eckerson (2002, 2003) also are excellent readings to assign as preparation for class.

Some variations on this approach are:
1. Have students read through the tutorial script ahead of time as homework, and assign pieces of the script to different students to perform on lecture day.
2. Have the students follow along with the tutorial application as you lead the demo. However, you should not try this with large classes for performance reasons. And, we suggest that you test this approach ahead of time in your environment to ensure that the response time is satisfactory with many students following along simultaneously.
3. Demo the tutorial script in an ad hoc way during class, and then have the students go through the tutorial script as an assignment afterwards. They can report back on their experience, such as the three most interesting capabilities of the product, the three most useful capabilities for a business analyst, etc.
4. Combine this approach with the e-Trainer to allow for students to obtain hands-on experience in a laboratory situation.

Hands-on Experiential Learning

Many instructors teach technology by having students interact with software in a hands-on way in a laboratory setting or independently. In these cases, instructors can use the e-Trainer software for its tutorial and testing capabilities. A typical scenario would be for the instructor to assign all or a subset of the 23 e-Trainer lessons. The students would complete the assigned lessons, taking the test at the end of each lesson as they complete it to assess his or her mastery of the material. When the students first log into the e-Trainer, they are required to set up a user id and password, which allows the software to track individual performance as students complete the e-Trainer lessons. Hugh Watson at the University of Georgia has his students perform each lesson until they receive a perfect score, and then they are required to email him their test results (Figure 1).

Some variations on this approach are:
1. Fay Payton of North Carolina University first has her MBA class go through the e-Trainer lessons. Then, Professor Payton assigns groups of students to the various Analysis Modules and has them write their own "e-Trainer" lessons as a project. She hopes to share the results of her activity on the Teradata University Network in late 2004.
2. Have each student (or small groups of students) "teach" one of the e-Trainer lessons to the rest of the class. They should prepare by practicing their lesson and by doing outside research using the MicroStrategy informational resources. As they perform the demo in class, they should also present 3-5 additional interesting things about their e-Trainer topic that they learned from their research.
3. Assign portions of the tutorial script after the e-Trainer is completed.
4. Assign a scenario-based assignment after the e-Trainer is completed.

At the University of Virginia, students are interested in learning practical skills that they can apply in industry. They enjoy gaining skills thatcan help them land jobs. For students interested in MicroStrategy, we encourage them to master the tool through the e-Trainer and then list this basic "certification" on their resume.
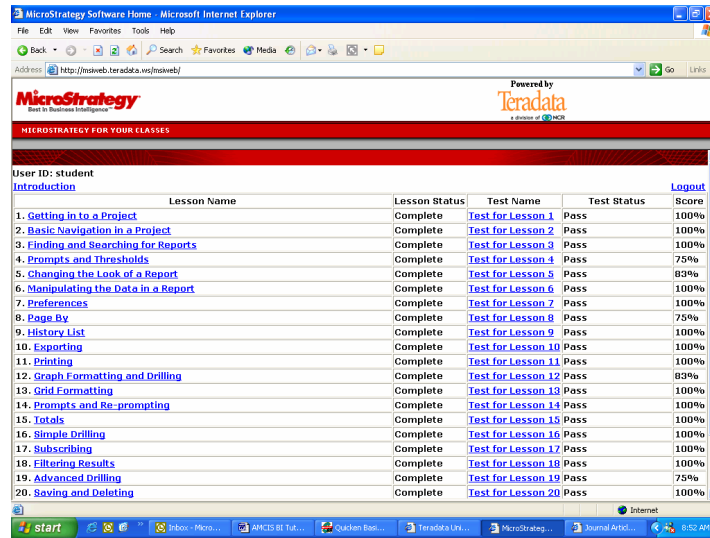
Figure 1. Sample Test Results for e-Trainer

Scenario-Based Assignments

Often the best way to teach a practical topic is for students to solve a practical problem, particularly if you are dealing with graduate students or business students. My favorite way to teach business intelligence is to set up a real business scenario and then have the students act as analysts and do some analysis using a business intelligence tool. In the case of MicroStrategy, this can be done by crafting scenarios based on the tutorial application. A great example by Bonney (2003) is shown in Table 1. The students read the scenario and then answer the questions using the Sales Analysis Module, which is available under the link for MicroStrategy Analytic Modules. The solution to this particular assignment is available to instructors only on the Teradata University Network.

AdVent Technology: MicroStrategy Sales Analytic Module Assignment

As Vice President of Sales for AdVent Technology, you are preparing to visit some of the sales offices on the East coast. AdVent manufactures computer equipment that is sold in a business-to-business environment. The sales force is structured in regions, East, West, and Central, and within those regions are sales districts containing multiple reps. Along with the computer equipment that AdVent sales, it also offers consulting services for system design and implementation.

Sales for AdVent have been down, and as VP of Sales, you are very interested in getting things going in the right direction. So with that in mind, there are many tasks you would like to get accomplished on your trip.

Morale is very important to keeping a sales force focused. On your trip to the New York and Atlanta offices, you would like to congratulate any rep who has landed a big deal for the company in Q1. Obviously you need to know who those reps are and what the deal mount was in order to put together a speech while visiting the office.

1. Make a list of any rep that is in the Atlanta or New York office who has landed a deal that was large enough to be in the Top 10 deals in 2002 Q1 for the company. List the rep, the deal amount and the customer who made the purchase. (List in a Word file or in Excel file found in question 2.)

An important role for the VP of Sales is to actually help generate sales. Another thing you would like to accomplish is to conduct a strategy session with sales mangers and reps. During this strategy session, you would like to review opportunities in the pipeline and solicit feedback from the sales staff to determine if there is anything you can do to help close the sale.

> 1. Generate a list of the projects in the pipeline for Atlanta and New York that shows who the rep working on the project is, as well as the customer and expected worth of the project. Export report to Excel to be turned in.
>
> It is the VP of Sales' responsibility to conduct reviews of the district managers while visiting their offices this time of year. These reviews focus on last quarter's sales results and are used to determine areas for improvement as the year moves forward. The Atlanta and New York district managers get a scorecard that breaks down their performance by revenue and quota. Not only are you interested in the Atlanta and New York scorecards, but you like to see all of the districts' results so that you can compare all of the districts in order to gauge performance.
>
> 1. Generate a scorecard that shows all districts' results together for easy comparison. (Hint: You need to drill down on sales region). Export your report to pdf. format to be turned in.
>
> The solution to this assignment is available at www.TeradataUniversityNetwork.com to registered instructors.

Table 1. Sample Assignment for Sales Analytic Application (Bonney 2003)

Research Projects

Some instructors want students to explore software topics in innovative ways. I like to assign topics to students and then have them research the topic in depth and present results back to the class.. One example of the research project I use for graduate students. I assign groups of students to various business intelligence topics, such as business intelligence platforms, analytic applications, customer relationship management, and business performance management. I then give the students some direction by providing a short list of resources (e.g., the Teradata Student Network). The students are charged with learning the topic in-depth and then presenting the topic to the class in a 45 minute presentation. The presentation must include a demo of a representative tool of their topic.

The student groups who are assigned to business intelligence platforms and analytic applications use the MicroStrategy resources in their research, and the tutorial application for the required demo of their presentations. Some groups choose to "assign" some of the e-Trainer lessons to their fellow classmates as preparation. This exercise allows each group to become the "expert resource" in one area of business intelligence, and the presentations expose everyone in the class to every topic. I find this approach to be quite effective. Hugh Watson from the University of Georgia also assigns research projects to his students, and he has posted his assignment in the Teradata University Network under the Teach section of the web site.

CONCLUSION

Clearly, there are many ways in which instructors can use the MicroStrategy resources available on the Teradata University Network to teach business intelligence in valuable ways. I strongly encourage instructors to share their creative efforts by posting assignments and other resources on the Teradata University Network, so we can continue to innovate and to improve teaching effectiveness in this area.

In the future, MicroStrategy and other Teradata Business Partners will continue to post new resources so that instructors can continually have access to the latest and most relevant business intelligence tools and techniques. In this way, instructors can better prepare their students for careers that include business intelligence.

ACKNOWLEDGMENTS

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