

CAMPUS TECHNOLOGY

From the Syllabus Media Group

May 2005

Business Intelligence Technology >> SuperData

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As ERP systems spark a deluge of data on campuses nationwide, savvy schools are turning to business intelligence software to make sense of it all.

Who would have thought that a state funding crunch would have spurred campus administrators to uncover millions of dollars in “found” revenue, via business intelligence (BI) software? Surely not officials at the University of Minnesota, where funding for higher education is at an all-time low. In fact, over the last 30 years, the state of Minnesota has dropped from sixth to 26th out of 50 in percentage of municipal budget support for public colleges and universities. Overall, funding has declined by \$100 million since 2003, and during the current fiscal year, state appropriations will provide only 22 percent of the university’s total revenue. It’s no wonder officials at the university had been tasked with the unenviable challenge of developing new and sustainable revenue streams to ensure the school’s future.

It was back in 1997 that university officials first responded to worsening conditions by investing an undisclosed amount in a plan to uncover new revenue streams and curtail inefficiencies across the board. In an effort to snuff out redundancies that were presenting a significant drain on resources, administrators implemented an Enterprise Resource Planning (ERP) system, and a new strategy to distribute responsibilities for day-to-day

decisions across administrative levels and departments. Then, to make sense of the data that the new ERP system presented, and shape the information exactly as they wished, officials invested in business intelligence software from Cognos (www.cognos.com).

Over the next few years, campus officials set up different programs in the BI software to track unbilled tuition, grant maturity cycles, student matriculation and performance, course management, and a host of other data sets across campus. The software did its job masterfully. Earlier this year, school officials announced significant cost savings and business process efficiencies across the board. They unveiled increased matriculation rates, and cut selected courses that weren’t drawing a minimum number of students. And then there was a surprising bonus: School officials identified nearly \$5 million in unbilled tuition during the implementation of a student financial system, most of which they recovered on the spot.

“To say we have been shocked by the results of the [business intelligence] software would be an understatement,” says Susan Grotevant, director of the Information Management Systems department. “It has single-handedly helped us get a grasp on our [student, finance, admission and course data], and make the most of an otherwise depressing funding situation.”

Grotevant isn’t the only one to discover the virtues of BI; as universities continue to spend larger and larger sums of money on ERP systems to digitize data, the need for similar software packages to make sense of the digitized data and use that data to achieve business goals, has gone through the roof. The logistics of this relationship are simple: As ERP systems such as Oracle (www.oracle.com), PeopleSoft (acquired by Oracle; www.peoplesoft.com), SAP (www.sap.com), and SCT Banner (www.sungardst.com) spark a deluge of information, BI helps make sense of it all. And while critics joke that the very notion of “business intelligence” is an oxymoron, in many cases, BI software quite literally becomes the essential tool that enables administrators to find the proverbial needles in their haystack of numbers and figures.

Mining (and Analyzing) the Haystack

When the University of Minnesota purchased its ERP system from PeopleSoft, the underlying principle that guided the development of the ERP modules was that instructional revenues should follow costs. Under an internally designed plan dubbed Incentives for Managed Growth (IMG), the administration provided financial incentives to individual colleges at the university, to offer new courses and enroll additional students. In return, the school kicked back 75 per-

cent of the net tuition revenues to the college of instruction, and 25 percent to the college of enrollment.

Previously, the university had managed all of these financial planning and recruitment decisions centrally; a scenario that, unhappily, allowed for cost overruns and sometimes sizeable miscalculations. The adoption of the new IMG system, however, required colleges to make their own decisions, as it also created an information-rich decision environment that could reach to the lowest levels of the organization. Suddenly, colleges and departments realized that they had the ability to change revenue and educational outcomes by the types of decisions they made. In order to do this, they needed more concrete financial and enrollment data, and they needed it fast.

The data wasn't exactly readily accessible, however. First, college and department heads needed to transcend information silos to reconcile and integrate financial and student data from multiple legacy and ERP systems. Next, they needed to aggregate and organize this financial and enrollment information in a way that facilitated analysis necessary for decision-making. Finally, they needed to get the financial and enrollment information out of ERP systems and off of paper-based reports, into a format that could be downloaded, manipulated, and easily integrated using ordinary desktop applications.

"Historically, people would ask one question about how much a particular course cost to run, and you'd do a report. They'd ask another question about how much another course cost, and you'd do another report," says Grotevant, who remembers those reports as huge printouts of unintelligible charts and statistics. "Once we embraced the [new management philosophy], it became clear we were going to need to completely re-evaluate the way we had used our data in the past."

Grotevant says that she selected PowerPlay® software because of the way department heads could customize it. The customizable programs were known

as "cubes," and during the first few years of the implementation, she and her colleagues used one cube to better understand how tuition revenues are earned. By analyzing data about course enrollment and student behavior/matriculation, colleges had the opportunity to recognize that admitting higher numbers of less-qualified students (who generally take fewer courses and make greater demands on student services such as advising) was not the best means for meeting higher net tuition revenue targets.

But the benefits from BI didn't stop there; better analysis and other cubes offered the colleges additional opportunities to increase net revenue, including using gift aid more strategically to attract and retain students of higher ability; requiring higher minimum course loads; developing tools to help advisors and instructors identify and counsel students in academic trouble; managing class sizes; understanding and managing tuition discounting; and gaining a better sense of what type of student succeeded at the university. At the end of the day, BI provided college and department officials with the information they needed to provide a higher-quality undergraduate experience.

Then of course, there was the unexpected: When they investigated data about tuition payments, school administrators uncovered flaws that, for years, had existed in the PeopleSoft student financial system implementation, and the discovery resulted in uncovering more than \$5 million in unbilled tuition. The university set out to recover this money with a combination of letters and phone calls outlining the glitch. Save for a few cases, most of the money was recovered without incident, a savings that Grotevant says "more than paid for" the school's investment in Cognos, right out of the gate. Slowly but surely, by investigating inefficiencies and seeking to cut costs, the business intelligence system was doing the job.

Today, Grotevant says the university has parlayed its Tuition cube alone into revenues that have increased by \$187

million, or 76 percent, since 2000. Other cubes have yielded similarly breathtaking results—the Course Enrollment cube, for instance, has enabled the school to tailor its course offerings to general student interests and eliminate courses with sagging interest, again reducing costs. In order to forecast the number and types of courses needed down the road, future plans for improvement in the area of course management call for extracting preference information from the school's Advisement and Academic Progress System (APAS), as well.

"I don't see my job as providing reports, but instead, as providing the resources for people who use information to make decisions," Grotevant says, adding that the school also is developing new cubes for Human Resources and Student Aid. "In this day and age, with funding and other issues constantly nagging at schools like ours, I don't know how any institution can manage without making the best of the information it has."

Reinventing Admissions

The University of Minnesota isn't the only school using business intelligence to examine and drive admissions decisions; two schools in Florida are doing it, too. At Florida State University in Tallahassee, for instance, BI tools from Business Objects (www.businessobjects.com) have changed the admissions process completely. In the past, the school employed an admissions model that provided every interested student with the same amount of marketing literature. Recently, by incorporating data on characteristics such as hometown, high school GPA, and more, the school began to get smarter about how it spends its marketing money, conserving resources for those students who are most likely to actually enroll.

Today, according to Rick Burnette, director of Student Information Management, the results of the \$200,000 investment in BI speak for themselves. For starters, the school has increased the size of its freshman class by more than

1,500 since 1999, a rise of roughly 35 percent. Secondly, in the same period of time, FSU has increased the average SAT score of its incoming freshman by 55 points, to 1201. Finally, the school has grown the number of minority students on campus by approximately 10 percent.

“We came from an environment where we had static data and we couldn’t lift it off of the page,” says Burnette, looking back. “But, from dumb statistics you can get dumb conclusions, at least that’s what we thought until Business Objects came along.”

Down the road, at Tallahassee Community College (FL), officials relied upon BI software from SAS (www.sas.com) to unlock data about their admissions process. Starting in 2003, administrators switched the admissions process from a voluntary advising system for first-time students, to a one-on-one program that included software to track how students handled the transition to the school. How many hours of classes did they take? How frequently did they drop classes? What was their average GPA? By pulling in statistics from a variety of systems, officials were able to answer questions like these, and correlate those answers to broader, overarching trends.

So far, says Barbara Sloan, vice president for Academic Affairs, the amount of useful data has been staggering. While they have yet to incorporate this data into formal policy changes, Sloan has been able to get a general sense of how courseload corresponds to performance, and how dropping classes may actually hinder a student’s ability to learn. She predicts that over time, the school will be able to use the information to target its recruitment and admissions resources, to make students more successful. With a few minor changes, she says the school also should be able to break even on its initial \$200,000 investment, despite an annual \$75,000 fee to keep the system going.

“As a dynamic institution that needs to keep up with change, we must have relevant information at our fingertips,” she says. “In this day and age, it’s high

time to make decisions on hard data, not just anecdotal information.”

Other Applications

There are other creative ways to implement BI. At Rensselaer Polytechnic Institute (NY), officials use software from Hyperion Solutions Corp. (www.hyperion.com) to drill down into data sets, delivering up-to-date information about how much money researchers have remaining on their grants. Ora Fish, Data Warehouse program manager, says users also implement BI to coordinate financial information in preparing quarterly financial statements. She adds that the biggest challenge has been getting users to embrace the new technology, since they are so accustomed to the labor-intensive method of “green bar” reports for similar data.

To handle similar tasks, technologists at Yale University (CT) also use Hyperion software, and they teaming it with reporting tools from Oracle. There, Laura Craft, director of the Office of Information Management, says an \$800,000 investment in a new system has replaced what Yale employees called the Rainbow Reports (named for the colored sheets of paper on which they were printed) that were run off the mainframe and manually distributed. Today, via Hyperion, nearly 10,000 reports (mostly financial) are generated automatically and delivered through an electronic portal. In addition, another 10,000 reports are run monthly on an ad hoc basis, as users need to research particular financial data.

“This is now all transactional reporting,” Craft asserts. “Reports are so easy now that after every batch, we have our people ask themselves: Are these the right transactions? Did they hit the right accounts? Is everything in compliance? [Business Intelligence] is a great way of understanding all of those issues, and then some.”

At the University of Notre Dame (IN), where Craig Brummell, director of ERP programs, uses software from Business Objects, officials are optimiz-

ing administrative systems reporting through a massive ERP effort dubbed Renovare. The endeavor ultimately will enable the school to implement more robust information in every facet of university operations, including tuition flow, endowment funds, and human resources data on staffing. Then, there’s the University of Illinois, where Director of Data Warehousing Andrea Ballinger has overseen an expenditure of \$1 million on Business Objects software to build other HR-specific cubes, including one where employees can access a checkbook balance of their paid time off.

Information Systems people are using BI, too. At DePaul University (IL), Senior Data Warehouse Analyst Russell Patterson says he and his colleagues use BI software from Informatica (www.informatica.com) to keep track of how many faculty and staff members are using the department’s Web portal. The group uses the information to determine loads on the system so they can plan for periods of high demand. Elsewhere on campus, technologists utilize a similar function of the software to track which students sign up for tickets to athletic events, and how many of the students who sign up for tickets actually use them to attend.

“For us, business intelligence is incorporated to justify things such as our portal or athletic fees,” Patterson explains, adding that DePaul had used PeopleSoft’s BI functions for a while, but deployed Informatica last year. “It’s a valuable part of making sure we on campus continue to have the things that all of us appreciate.”

The Payoffs

As Patterson implies, quantifying ROI for BI implementations can be difficult, since financial impact is frequently hard to gauge. Only in rare instances such as the University of Minnesota’s case, can a school tab a specific figure as a result of BI. (At Minnesota, administrators plan to use BI to save even more money down the road.) At other schools, though benefits have been plentiful, they’ve been harder to quantify.

Brummell at Notre Dame says that for him, after years of using various reporting tools for disparate data, simply agreeing on a standard institutional reporting tool qualified as a success. (At Notre Dame, as at many other schools, it is BI software that enables users to replace voluminous, paper-based green-bar reports with customized, targeted, Web-based documents that lay out data in a sensible and easy-to-read fashion.)

“The whole process of business intelligence is an iterative one,” he says. “Simply having this as an option has opened doors we never dreamed of opening.”

At the University of Miami (FL), for instance, where officials recently purchased BI software from MicroStrategy (www.microstrategy.com), Daniel Thomas, director of the Database group, doesn't even try to figure out return on investment. Instead, Thomas focuses on the practical ramifications of the new system, noting that his people aren't requesting more reports, but instead, they are requesting “smarter” ones.

Fish at RPI quantifies return on investment in redirected personnel hours as job expectations change and decision-makers get accustomed to information availability. Whereas users formerly spent days each month sifting through reports, they now spend hours, mostly scrolling through pre-packaged reports delivered electronically. She says that RPI has gone so far as to create a layer of business metadata to make the BI system even more intuitive for ad hoc reporting and analysis on almost a daily basis, and has hired a new staffer whose sole responsibility is to address campus reporting and analytical needs.

“The cultural changes that the new technology brings to the campus rollout strategy were carefully planned and executed,” she says. “The rollout strategy recognized the need for people to acquire new job skills and make other

adjustments before [business intelligence] could succeed.”

At Yale, Craft prefers to focus on the environmental impact of BI. Before implementing the software, Craft chronicled the time spent each month generating reports. Once the reporting system was up and running, she took another log, and calculated how much time faculty and staff members saved when they no longer had to sit there printing out reports, putting in parameters, and so on. In any given month, she says, users save “days” worth of time. What's more, she adds, people who in the past were supposed to look at reports but did not, now take the time to check things out and investigate the data that's available to them, because the reports are more relevant and easier to read.

Others echo these sentiments as well. At the University of Wisconsin, which recently implemented BI software from Informatica, David Hart, special assistant to the associate VP, says that all 13 schools in the state system have experienced similar benefits in usefulness and adoption from users gaining a better understanding of their data. For Hart, perhaps the biggest boon from BI has been the knowledge that deans and other users who previously didn't get useful information in a variety of areas now see precisely the bits of data they need, empowering them with appropriate facts, and inspiring them to act decisively.

“If a dean has the right information to make a decision in a timely fashion, what's the ROI on that?” Hart asks. “In the end, we've probably made the most money on those types of situations. I don't know about you, but that's what I call success.”

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Defining BI

IN A NUTSHELL. Business Intelligence (BI) software enables users to obtain enterprise-wide information more easily. These products are considered a step up from typical decision support tools because they more tightly integrate querying, reporting, OnLine Analytical Processing (OLAP), data mining, and data warehousing functions. They frequently are used in conjunction with Enterprise Resource Planning (ERP) systems such as Oracle/PeopleSoft, SAP, or SCT Banner.

There are a variety of products that claim BI capabilities, but the bottom line is that they should enable users to obtain all of the information they desire from their organization's databases, provided those users are allowed access to certain information. All of the information is presented in sensible easy-to-read formats, most frequently over the Internet or via e-mail. The result, of course, is a more comprehensive and targeted search of available data, and the incorporation of that information into reports to assist in decision-making of all kinds.

BI software is available in a variety of flavors — or cubes — designed to cull data from just about every area of university operations including Finance, Administrative Systems, Payroll, Grant Management, Admissions, Human Resources, Student Services, and more.