

Managing from Information

Data Marts and Business Intelligence Help Higher Education Leverage Administrative Systems

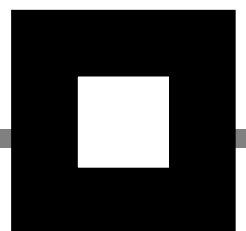


TABLE OF CONTENTS

Today's Trends in Higher Education	3
Diversity in Student Populations	3
Faculty Retirements and their Impact on Teaching	3
Scenario: Student Prospecting	3
Pressure From Non-Traditional Institutions and Approaches	4
Summary: The Need for Flexibility in Higher Education	4
Higher Education IT Changes with the Trends	4
Less Bureaucracy, More Mission	4
Outsourcing Gains Acceptance	4
The Rise of E-Business	5
Adoption of Commercial Software	5
Re-examining The Traditional Technology Model	5
Input	5
Transaction Processing	6
Output	6
Scenario: Capacity Prospecting	6
Information Analysis	6
Summary	7
About Cognos	7

TODAY'S TRENDS IN HIGHER EDUCATION

The winds of change are blowing strongly in higher education. Evolving demographics, shifting student needs and interests, and new ways of using technology in all aspects of education are all converging to create opportunities to dramatically transform academic and administrative processes in higher ed.

Diversity in Student Populations

Higher ed institutions are preparing for a significant boomlet in the next 10 years, when as many as two million additional traditional students will swell the rolls of colleges and universities around the country. More dramatically, as many as 20 million non-traditional students – “lifelong learners” such as parents, professionals, and even retirees – will also enroll in various higher education programs for first or second degrees, certificates, and professional training. These programs are often delivered in non-residential locations such as homes, satellite campuses, or corporate training centers.

These trends will dramatically affect historical data, upon which we base many of our student processes. For example, accurate and optimal course scheduling relies heavily on statistics from previous semesters. However, changing student profiles will mean that historical statistics will have less bearing on future requirements and will result in poor planning. Institutions will need to more closely track student demographics and trends over shorter intervals than ever before, understand and project the impacts, then plan accordingly. The information garnered can have a profound affect on many processes and resources.

Faculty Retirements and their Impact on Teaching

Higher ed is also seeing a graying of its faculty. Waves of government funding expanded the higher education system in the '60s, allowing

SCENARIO: STUDENT PROSPECTING

A university launches a prospecting campaign targeting 1,000 students. Currently, the university buys lists of prospects from the College Board and uses data collected from phone calls, campus visits, and its Web site to target students fitting an overall “desired profile.” However, using data marts and business intelligence software, the same university can identify prospects with far greater precision, including those not found in its traditional sources – prospects who have a much greater chance of choosing, and succeeding at, the institution. This new approach helps ensure that precious prospecting resources are directed toward the best pool of prospective students.

How? The admissions director uses the school’s own data mart to create a list of prospective enrollees who have had frequent interaction with the institution – through the university admissions Web site, calls to the school, or in-person visits. He enriches this list by cross-referencing it against standard test scores on file, financial aid requests or information submitted by the student. With a profile for each student, he then compares the list to similar lists generated on the last five years’ worth of graduates with desirable attributes (e.g., a specific major, a high level of academic success, active alumni involvement, etc.) to find similar prospects.

schools to ramp up their faculty to meet the demands of the post-WWII baby boom. Now, however, colleges are facing a huge retirement issue in their faculties, with fewer Ph.D. candidates in the pipeline to replace them. Some schools anticipate that 50 percent of their faculty could retire in the next five to 10 years. This has implications on how colleges interact with and educate their students.

Institutions will need to carefully monitor faculty attrition. More importantly, schools will need to know which classes, curricula, advising, research, and public service commitments will be impacted by retirements so they can plan accordingly. Simulations and predictive resource planning will be required to maintain current resource ratios.

Pressure from Non-Traditional Institutions and Approaches

Traditional higher-education institutions are beginning to feel pressure from less-traditional learning institutions and approaches. For-profit universities, long-distance learning institutions, and industry-higher ed alliances are just some of the players entering college and university space. They offer “anytime, anyplace” learning opportunities that are gaining popularity. While the traditional undergraduates will most likely continue with a residential education, they will have different learning expectations.

SUMMARY: THE NEED FOR FLEXIBILITY IN HIGHER EDUCATION

All of these pressures are causing traditional higher ed institutions to think and plan differently. Higher ed planners need to understand the resources available, project anticipated trends, and work through “what if” scenarios. Shifting student demographics and needs, changes in faculty availability and makeup, and pressure from non-traditional education institutions are all driving the need for flexibility in the way education occurs.

To respond to these dynamics, many higher ed leaders and managers are turning to information technology. New-breed IT solutions are delivering value not only by automating manual bureaucratic processes (though that value is certainly significant in its own right), but also by enabling schools to see, analyze, review, and manage based on the information those processes generate.

By equipping leaders, managers, and staff with useful information, IT can play a strategic role in the evolution of the institution’s mission. Gaining and applying business intelligence from approaches like data marts, operational and trend analysis, and “what if” scenarios will enable institutions to understand today’s fast-paced trend and demographic changes, then plan and execute for future success.

HIGHER EDUCATION IT CHANGES WITH THE TRENDS

Historically, higher ed administrative systems can largely be characterized as “automated manual” processes: application, registration, grading, billing, housing, etc. These automation systems haven’t addressed the need to change underlying processes – they’ve only brought a level of speed and automation to previously manual processes. Whole bureaucracies have arisen to support these evolutionary, antiquated processes and systems, preventing resources from being applied to the institution’s true mission: education.

Less Bureaucracy, More Mission

Colleges and universities are now looking to IT to shift from pure automation to a higher value solution that changes the way services are delivered to clients. They’re looking to go past tactical automation and move to greater strategic use of technology through self-service solutions for clients, and the strategic use of information for analyses, planning, and reporting to help shape the institution’s strategic direction.

Performance indicators, changing learning models, and resource allocation models will be critical in any institution’s future. More schools are requiring comparison data, both internal and external, for planning and competitive analysis. For example, colleges that integrate more technology into their programs will have a higher demand for “technical” classrooms. To stay competitive and meet campus demands, schools will need intelligent, flexible scheduling of these resources and the ability to predict demand.

Outsourcing Gains Acceptance

Institutions have traditionally seen the benefits of outsourcing auxiliary services such as food service, housing, bookstores, or campus security. However, it’s common for them to build and staff internal resources to provide core services such as payroll,

enrollment application processing, procurement, infrastructure operation, and more. Today, that's changing. Schools are now exploring alternative models for delivering these services, such as outsourcing and application service providers (ASPs). These alternatives enable third-party providers to offer consistent and improved services at predictable costs while allowing the school to focus on mission-related services that provide value to clients and the institution.

The Rise of e-Business

From e-procurement of supplies to online tuition payments and bookstores, e-commerce has exploded on campus. This paradigm will continue to have a profound impact on schools' ability to improve "customer" service and decrease costs.

As e-commerce transitions to e-business (moving from only financial transactions to changing the way institutions interact with student customers), that same philosophy will continue to permeate other areas in higher education – advising, course selection and registration, applications, and much more. Consider, for example, an integrated system that understands what courses a student has registered for, presents the appropriate required and recommended textbooks for those courses, enables the student to purchase them online from the lowest-priced vendor with a few clicks, and delivers them to the student's dorm room the next day.

Adoption of Commercial Software

Like businesses worldwide, higher education is seeing the wisdom and value in deploying commercial application software. Education-optimized vendor solutions are having a major impact on schools because they are bringing best-practice processes to departments – not merely mirroring sub-optimal or evolutionary processes. This trend creates an administrative processing environment that can include multiple vendor- and internally-developed solutions.

The shift to commercial software means that schools can concentrate on providing institution-specific, strategic solutions to their customers while a vendor addresses generic core processes. These solutions include portals, data analysis capabilities, and reengineered processes – all things that help further a school's unique mission.

Higher education technologists are taking advantage of the capabilities and trends in the marketplace, implementing solutions that support their institution's mission. The shift from the operational to the strategic use of technology is enabling schools to improve their planning and management, provide a higher level of service to customers, and concentrate their precious internal resources where they count the most – on teaching, learning, research, and public service.

RE-EXAMINING THE TRADITIONAL TECHNOLOGY MODEL

Today, in the resource-constrained, finance-constrained environment of higher education, institutions must respond to their many challenges with solutions that add value, lower costs, streamline processes, and improve the satisfaction of students, faculty and staff – a complex proposition. Schools have traditionally managed all pieces of the administrative computing model (input, transaction processing, and output) with varied levels of success.

The model, however, is starting to change. The new approach is for valuable institutional IT resources to concentrate on "input" and "output" functionality, and to use best-practice solutions for "transaction processing" by either purchasing vendor solutions, outsourcing, or using ASPs.

Input

Collecting, accessing and updating data and information needn't be centralized functions. Indeed, they shouldn't be. Instead, institutions are enjoying great success by reengineering processes.

They are distributing these functions to the end users – students, faculty, alumni, and staff – and centering them around processes.

For example, students should be able to use a simple Web browser to:

- View current-course inventory
- Register for classes
- Access grades
- Sign up for advising times
- Reserve housing assignments

Transaction Processing

Colleges and universities have traditionally focused the majority of effort on transaction processing solutions (e.g., student, human resources, financial, alumni, etc.). These are the large administrative systems that print thousands of paychecks each week, manage academic files and histories for hundreds of thousands of students, and account for the large sums of tuition, grant, scholarship, etc. dollars that flow through the institution.

These systems and processes are ripe for alternative approaches, including the use of ASPs and outsourcing. Many standard processes are actually fairly generic, not adding value to the education mission. Ideally, these can be dramatically improved by implementing best-practice-based, vendor-provided commercial systems run that are managed internally or by an ASP, or be outsourced totally. These solutions are attractive because they take advantage of economies of scale, can be more reliable, and often cost less. These solutions also free up internal resources to focus on higher-value, more strategic issues and challenges that more directly relate to the institutional mission.

Output

Output is an area that has long been underserved in higher education, primarily due to limited resources, the lack of robust tool sets, and the traditional management approach used at many institutions. In addition, data has resided in multiple systems and formats, making useful access difficult at best.

SCENARIO: CAPACITY PROSPECTING

A college needs to take a building “offline” for two years to remodel it, and wants to know the impact on classroom and faculty office space. The information stored in the school’s data mart will help the institution analyze the impact and create “what if” scenarios.

How? The facilities director starts by creating a list of all classrooms the university will need during the remodeling. To do this, she uses BI tools and the data mart – populated with data from the degree audit system – to predict the courses students will enroll in based on their declared major and previous patterns of electives. She then assigns classrooms to the courses based on historical assignment. Using reporting and inquiry tools to analyze this information, the facilities director can determine what classes and faculty members will be affected. She can also perform “what if” scenarios to determine the affect of changes in the project timeline.

As a result, the traditional approach to users’ output requirements has consisted of generating and delivering stacks of green-bar, operational reports based on data from transaction processing systems. These reports are typically predefined, transaction-centric outputs containing simple statistics and long lists of operational or exception data. They were not designed for strategic or analytic use.

Information Analysis

Today, internal and external drivers are creating a demand among deans and managers for information, not operational data. For many, the sensible strategy is a data mart solution that unites information for a single, coherent picture.

For example, instead of merely learning what the retention rate is, deans want to analyze the trends and factors influencing the retention rate. This information gives them the power to *affect* the retention rate.

Gaining “Business Intelligence” using data mart solutions opens a whole new world to users. For example, users can:

- Create longitudinal analyses
- Combine data from disparate systems to investigate and understand previously unknown relationships
- Analyze operational data and drill down to specific elements
- Run “what if” scenarios

Data marts and “BI” analysis tools enable strategic planning and decision-making management from sound, analyzed information. The potential benefits of this approach are enormous.

SUMMARY

Increasingly, higher education institutions are understanding the strategic value of IT. They are shifting from the traditional use of technology to streamline and automate processing to a strategic use – to understand and address change and better serve their customers as they work to achieve their mission.

Given the unrelenting pace of change, the ability of the school to successfully address, manage, and react to change is directly related to how well it sees and understands the factors creating the change. The strategic use of information, specifically the business intelligence available through data mart solutions, is integral to this

understanding. As schools ask their administrative and academic management at all levels to manage this change, maximize resources, and be more productive, it will be essential to understand, analyze, and manage from a base of information.

Higher education is awash in data, but sorely lacking in information. We can now use data marts and business intelligence technology to enable a strategic solution – melding disparate data sources into cohesive, unified, meaningful information from which institutions can manage intelligently.

ABOUT COGNOS

As the world’s largest and most successful vendor of Enterprise Business Intelligence solutions, Cognos plays a critical role in our customers’ success.

Cognos solutions leverage Internet technology to make information easily accessible to everyone in your enterprise, as well as to your customers and across your supply chain. The results: better, coordinated decision-making across the entire organization. More effective customer acquisition and greater customer retention. Improved business performance—at e-speed.

Cognos Web-based technology is a cornerstone of e-business. From the creation of data marts, to pre-built e-Applications, to sophisticated reporting, analysis, and visualization, Cognos software delivers the breadth and flexibility organizations need to thrive in the Internet economy.

COGNOS®



www.cognos.com

Visit our Web site at
www.cognos.com
to locate the office nearest you.

Cognos, and the Cognos logo are trademarks or registered trademarks of Cognos Incorporated in the United States and/or other countries. All other names are trademarks or registered trademarks of their respective companies.

January 2001

Printed in Canada using recyclable materials.