

WHITEPAPER

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## **BUSINESS INTELLIGENCE:**

**Leveraging Next-Generation Tools to Make Smarter Education Management Decisions that Drive Enrollment and Boost Revenue**



## Abstract

This is an era of new socioeconomic and technological realities. The business world, weighed down by responsibilities to constantly boost performance, sustain and grow customer bases, and prove - via bottom line results - that revenues are on the upswing despite economic pitfalls, has already adapted by harnessing the power of **Business Intelligence (BI)**.

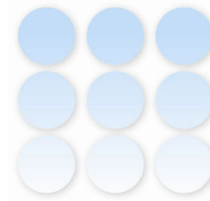
Every higher education CIO has days when he or she is confronted with decisions like:

- When is the right time to open a new campus at a new location?
- Are the students getting quality services?
- Is it the right time to launch new courses/ programs?
- How should I regularly monitor capacity utilization at a given campus?

The key to this simply lies in recording every possible data transaction generated in the various educational processes, and the rest can be taken care by the business intelligence systems.

This effective data tracking & monitoring using Management Information Systems (MIS) & BI systems will eventually help to analyze data points on a day-to-day basis, as well as aid in studying trends to derive the answers required by senior management to make business critical decisions. This paper demonstrates how BI provides an invaluable decision modeling tool that will inform those kinds of smart decisions.

While colleges and universities have unique and complex concerns that extend beyond the realm of traditional business paradigms, they also have obligations to accrediting and funding bodies, academic leaders, current and potential partners, and students - all of which are susceptible to the same external forces. Essentially, they too must show not just past results and potential, but leadership, growth, and progress. BI can help them achieve all of this - and more.



**By adopting these new and evolving BI trends, colleges and universities will be able to optimize performance and capitalize on heretofore unrealized opportunities.**



With this whitepaper, education leaders will discover:

- How to leverage BI to gain a deeper understanding of historical, current, and future outcomes
- Dynamic ways to analyze data such as payroll, courses, grades, applications, and credits in order to make better decisions that enhance performance
- New possibilities in curriculum strategies and campus and program expansion that will attract and retain more students
- A decision modeling tool that will redefine analytics, reveal unprecedented insights, and pave the way for more efficient, effective marketing and overall operations

By integrating Business Intelligence into their infrastructures, institutions of higher learning can key in on the same insights that have propelled businesses to new heights. They can become models of innovation, and drivers of success. Informed decisions can give them crucial advantages such as increased retention, insight on ways to launch pioneering programs and create new courses that attract future leaders, ideas to create new facilities that maximize revenue and instigate growth, and expanded capabilities that help them keep pace with - or accelerate beyond - the competition.



## Introduction

Colleges and universities are deluged by information. Student records, faculty logs, administrative accounts, funding requests, accountability reports, and course catalogues flood institutional depositories managed by the in-house MIS systems on a daily basis. Finding a way to filter through, make sense of, and improve upon this data presents an enormous challenge in and of itself, one which is typically addressed by transactional reports that help answer queries on “X number of students enrolled in Y classes, with Z results.” But these equations, necessary in revealing what *has* happened, lack vital elements such as *why* it has happened, what *will* likely happen next, and what institutions can do about it. Without these crucial insights, transforming raw data into concrete tactics and strategies that can catalyze growth is virtually impossible. This is where BI systems help.

Business Intelligence can dramatically transform and simplify this process by seizing what was previously unattainable. BI provides an expanded—and integrated—view of data that not only details historic trends, but also reveals current and predictive results, allowing administrators to grasp the story of information in its entirety. Armed with this holistic understanding, administrators can see how all of the pieces fit together, and in turn, apply new insights to refine processes, deploy resources more effectively, maximize ROI, and boost overall performance.

**BI provides an expanded - and integrated - view of data that not only details historic trends, but also reveals current and predictive results, allowing administrators to grasp the story of information in its entirety.**

BI provides an invaluable decision modeling tool that will inform decisions such as where to open new campuses, how to reduce student attrition and boost enrollment, and how to successfully introduce in-demand programs to campuses across the institution. By adopting these new and evolving BI trends, colleges and universities will be able to optimize performance and capitalize on heretofore unrealized opportunities.

## About Business Intelligence

BI has “forever changed how users access, analyze, report and share data,” says analyst and Ventana Research fellow, David Stodder.<sup>1</sup> Furthermore, according to Business Objects (a SAP company), “the more information you have, and the better and faster your analysis, the greater the probability that you will make winning investments.”<sup>2</sup> Several businesses have harnessed the power of BI to do just that: access, analyze, and gain insights from information spread across their organizations to improve company performance, attract and retain more customers, and strategically place new stores in untapped locations. And it’s paid off.

***When the City of Albuquerque leveraged BI software to identify opportunities to cut cell phone usage and related overage and usage fees, it saved the city more than \$2 million. And Toyota uncovered an alarming trend: that it had been over paying shippers two-fold in 2000. Google, Yahoo, and other Web-based companies use BI to research trends and capitalize on new market insights, with clearly advantageous results.***<sup>3</sup>

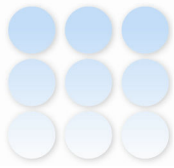
Improving organizations by providing business insights to all stakeholders leading to better faster, informed decision making

- ✓ Complete and integrated BI offering
- ✓ Consistent delivery of BI solutions leveraging execution methodology, technology alliances and in-house expertise



According to research firm Gartner, BI platform expenditures increased by nearly 22% in 2008.<sup>4</sup> IDC predicts that figure to rise by up to 10 percent in 2009, and a recent *Computerworld* survey indicated that 42% of businesses surveyed will increase BI budgets this year.<sup>4,5</sup>

Essentially, what all of this indicates is that businesses have been able to unlock silos of information, share them with the people who need them—when they need them, and uncover and analyze clear trends that make predictions about future results. As a result, enterprises have tapped into the power of BI to inform smarter decisions to improve offerings, marketing and operational strategies, and performance as a whole.



### BI Benefits

BI provides crucial insight into business risks, results, and quantifiable measures that can boost performance.

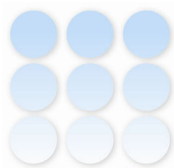
Essentially, BI allows organizations to:

1. Improve the speed and quality of decision-making by delivering cohesive and relevant data to key decision-makers
2. Move from concept to implementation with greater speed
3. Deploy fast, strategic responses to new market opportunities
4. Gauge the effect of pricing, promotions, and other initiatives
5. Understand and thus retain the most profitable customers
6. Capture accurate performance analysis on operational processes

Evidently, BI is big in business. The question is how can higher education leverage these technologies to produce similar - albeit uniquely suitable - results? Enterprises have achieved enormous success by integrating BI platforms into their structures, the foundations of which center on 7 key factors:

<b>Reporting</b>	To produce unified results that can be accessed and analyzed by several people from one place, BI needs to produce a single report with clean, consistent data.
<b>OLAP</b>	OLAP integrates data such as sales, marketing, management, BPM, budgeting, forecasting, and financial information on a multidimensional level for a variety of reports.
<b>Analytics</b>	Statistical analysis models provide dissectible information that reveals historical results and potential future trends to inform smart decisions for holistic organizational improvement.
<b>Data Mining</b>	Analyzing data from different perspectives helps to create categories that allow organizations to define market segments and related profitability.
<b>Business Performance Management</b>	Business performance management (BPM) involves organizing, automating, and analyzing business methodologies, metrics, processes, and systems that drive performance.
<b>Benchmarking</b>	Industry standards and best practices are held as comparative figures when analyzing business costs, cycle times, productivity and other internal factors to reveal actionable insights.
<b>Performance Analytics</b>	A combination of statistical analysis and data mining, predictive analytics allows organizations to identify risks and opportunities and assess future trends and results.

## BI in Higher Education



**Higher education is slowly beginning to catch on to the enormous benefits that businesses are already realizing through BI technology - but not fast enough.**

Higher education is slowly beginning to catch on to the enormous benefits that businesses are already realizing through BI technology—but not fast enough. According to Nicole Engelbert, senior analyst at Datamonitor who specializes in education, “IHEs are probably the most conservative market. If there is any ambiguity, it slows adoption to a halt.”<sup>6</sup>

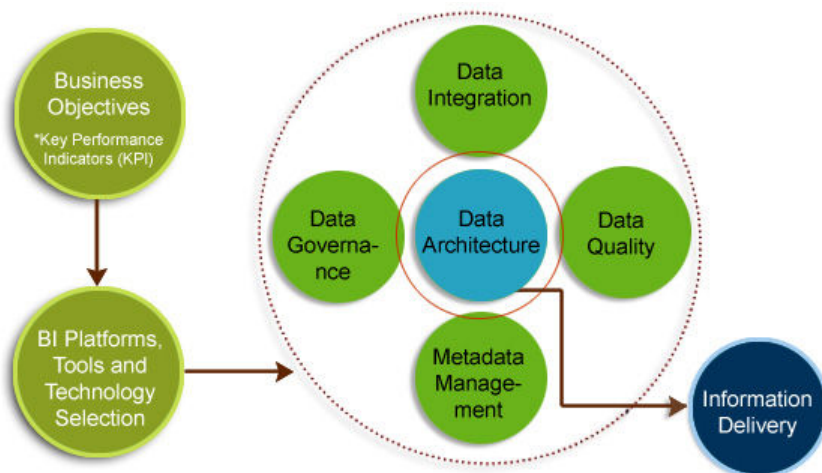
Studies indicate this to be true. A 2006 Datamonitor reports shows that only 12 percent of the 50 IHEs surveyed had already purchased a BI solution. That same year, 18 percent said they would in 2007 and a whopping 54 percent said they don’t plan on purchasing a BI solution, period.

This is likely due, claims one article, to the fact that “BI’s potential is so vast that it remains hard to get a simple understanding of it.”<sup>6</sup>

But just as it is true for the business sector, higher education may want to heed the warning that “There’s too much at stake for organizations to stand pat when it comes to using information and take action.”<sup>1</sup> And as one white paper suggests, “In today’s competitive and global world, the universities have to behave like businesses.”<sup>7</sup> That means that institutions of higher learning need to understand what BI means for them—and how they can successfully implement it.

**“There’s too much at stake for organizations to stand pat when it comes to using information and take action.”**

Simply put, BI can help colleges and universities to overcome the challenges involved with traditional reporting systems. As one article puts it, with BI, “admission files will connect to financial aid information will connect to student services files will connect to academic records, and so on. The end result will be data that can actually predict what the student might do next, and even calculate financial aid needs and shifting interests.”<sup>8</sup>



*This diagram depicts how Key performance indicators (KPIs) serve as the key inputs to BI systems, which in turn are applied on the vast amount of data available in the MIS systems to derive useful analytics.*

*From organizational growth perspective, there are varied KPIs that drive different roles in higher education organizations.*

Revenue, operating profit, student satisfaction, quality compliance, and faculty competency development are a few examples of these key performance indicators. And these will form the core of any BI setup, as they are indicative of business health of any organization.

## Managing Student Records

The National University of Health Sciences (NUHS) is a BI success case in point. After adopting BI in 2007, NUHS officials were able to view “one version of the truth.” In other words, data was no longer departmentalized, but rather captured and made accessible via a single dashboard. As a result, admission registrars could better track student admissions. As Keith Werosh, University Registrar at NUHS pointed out, “Today, we get [admissions numbers] on day 10 of the term. Before [BI], that information wasn't available until a couple of months into the term. This is a huge help in terms of informing the deans and executive management where we are and where we need to be for each program.”<sup>9</sup>

Werosh also indicates that the University can acquire better geo-demographic data for improved marketing, assess when students’ grades are slipping and address them immediately, quickly align with federal and state compliance regulations, and manage overall University finances more efficiently.



## Increasing Retention and Refining Marketing Strategies

One of the earliest adopters of BI in higher education is Florida State University (FSU), which invested in BI solutions in 1999.<sup>10</sup> Since then, the University has been able to increase freshman retention rates from 84 percent to 90 percent, and can now base admission standards on demographic trends and statistical modeling from the previous year's data. Richard Burnett, Director of Institutional Research at FSU, suggests that key insights derived from BI allow the school to constantly refine its tactics to gain a strategic advantage in the higher education sector. And FSU's director of student information management reports that BI allows the University to receive "greater return on our investment in terms of our activities."<sup>11</sup>

## Building Efficiency and Managing Resources More Effectively

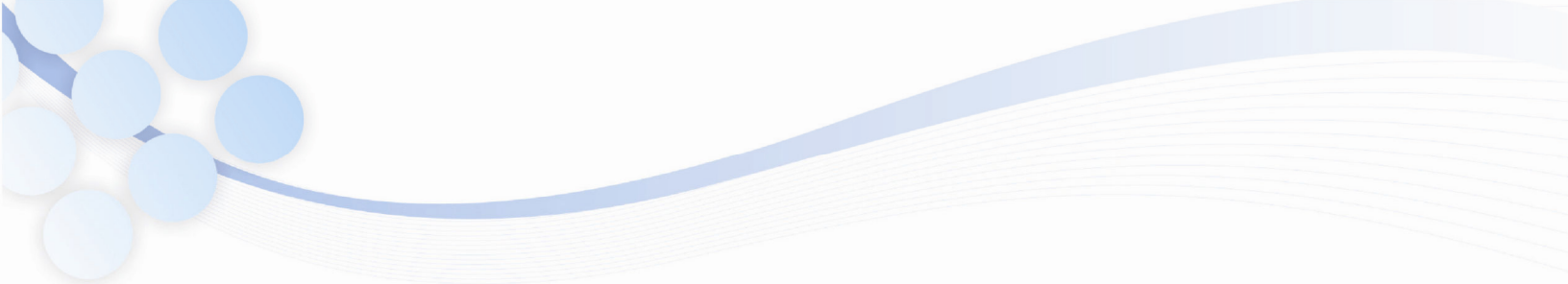
Several other schools have taken note. Ora Fish, acting director of integrating administrative computing services at Rensselaer Polytechnical Institute indicates that with BI, the Institute "can be more efficient in terms of distributing the teaching and researching load on the faculty side."<sup>12</sup> Rensselaer began a BI initiative called "The Data Warehouse Project," which, according to John Kolb, Rensselaer's chief information officer, "has allowed Rensselaer to significantly improve consistency and access to Institute information. This has allowed improved planning, forecasting, and decision-making processes for various campus constituencies." This project was in fact so successful that *Computerworld* selected the Institute as a finalist for its "Best Practices in Business Intelligence" award in 2006.

## Refining and Adding Courses, Site Locations to Meet Student Needs

Assessment is one of the constant pain points of all Institutions of Higher Learning, yet it is an important tool for understanding how well students are performing and can consequently make changes to improve these outcomes. With BI, colleges and universities can analyze the efficacy of courses and associated learning materials in near real-time and make immediate adjustments that will boost student learning and retention.

The University of Hradec Kralove, based in the Czech Republic, made the observation that, "Management of the university might find correlations between the use of multimedia in teaching and the motivation of students... [and] in better grades for such courses."<sup>7</sup>

To support student demands for particular courses, Andrew McAusland, associate vice president of instructional information technology services at Concordia University in Montreal indicates that he can "do all sorts of cross-related information mining," which allows educators



to see the demographics of students signing up for classes, and in turn, expand or reduce class sizes to support these trends.<sup>11</sup> At FSU, BI painted a clear picture of which classes were filling up fastest via alerts that get automatically sent out to key personnel when classes were 80 percent full.<sup>8</sup> Faculty could then change course sites to accommodate the accurate student loads.

This same technology can help colleges and universities expand facilities in “hot” locations. By looking into student records, administrators can see where the most successful applicants are coming from, and seize the opportunity to expand in underserved geographic areas.

## Centralizing Reporting and Increasing Accountability

As one source suggests, there has been a growing demand for accountability in higher education since the 1980s.<sup>13</sup> But for colleges and universities, adhering to these rising expectations is difficult for a variety of reasons—namely the accessibility of information for key decision makers. Administrators would traditionally wait for the IT department to develop efficient ways to extract specific sets of data from an enormous influx of information, and would then have to examine that data to ensure its accuracy before moving forward with any institutional changes.

At The College of St. Scholastica, BI has helped administrators access more information without having to turn to the IT department. Now, says Lynne Hamre, chief information officer at the College, everyone “can easily and on their own go in and make informed decisions on how to do the business of the institution. They don’t have to ask anyone, they don’t have to wonder how accurate the information is. . . We know how to get our data. We don’t have to sit and wait for it.”<sup>11</sup>

All of this is important for not only improving marketing and strategic planning, but bracing for an era of heightened scrutiny from funding and accrediting bodies. As Nicole Engelbert of Datamonitor points out, “Institutions are under a lot of pressure from a productivity and efficiency perspective. . . There’s a lot of push for accountability—from the federal government, state governments. . . accrediting bodies, even from the U.S. News & World Report. . . that’s pushed high-level decision makers to think, ‘How can we do better?’”<sup>11</sup>



## BI Case in Practice

As with any new approach to operations, it's wise to choose technology that aligns with an institution's strategic initiatives. Or, as Graham Tracey of Campus Technology points out, "There is no one-size-fits-all approach to BI project management. Instead, BI project managers must learn how to choose... [a solution that is] appropriate for the project size and scope."<sup>13</sup> Engelbert suggest that this can be accomplished by seeking out "vendors that have mitigated some of that pain [of implementing a BI solution]—through highly evolved sources for the implementation, through pre-built data models and modules for specific areas of the institution, such as recruitment, retention, or advancement, [and through] report templates."<sup>14</sup> In addition, it's important to find a strategic partner that will work with an institution's staff to ensure seamless integration, testing, and ongoing maintenance.

NIIT, with more than 28 years as a learning leader and practitioner, has built learning competencies in the areas of content production, custom content, custom technology solutions, and customized enterprise services to deliver a complete suite of learning solutions focused on the unique business challenges of our clients. In this process NIIT has the need to manage data across all centers, across various geographies, and still have a consolidated view on performance, reporting, etc.

To meet this requirement, NIIT defined its unique approach in developing and refining its own in-house BI tools to not only better understand its own performance, but to also find ways to help its clients improve productivity, efficiency, and ROI while minimizing costs. Research-based innovation is the driving force of NIIT, which is precisely why the company has built, tested, and polished a suite of BI tools that help company leaders identify key performance drivers and trends while revealing untapped opportunities and areas that require improvement—all in an effort to strengthen NIIT's ability to help K-12 learning development programs, career training, and the field of higher education. The result, which has evolved over last decade, was 'Encore,' NIIT's own technology solution to meet its MIS & BI needs.

The following workflow depicts how the Encore system was gradually implemented at NIIT and the key systems involved:

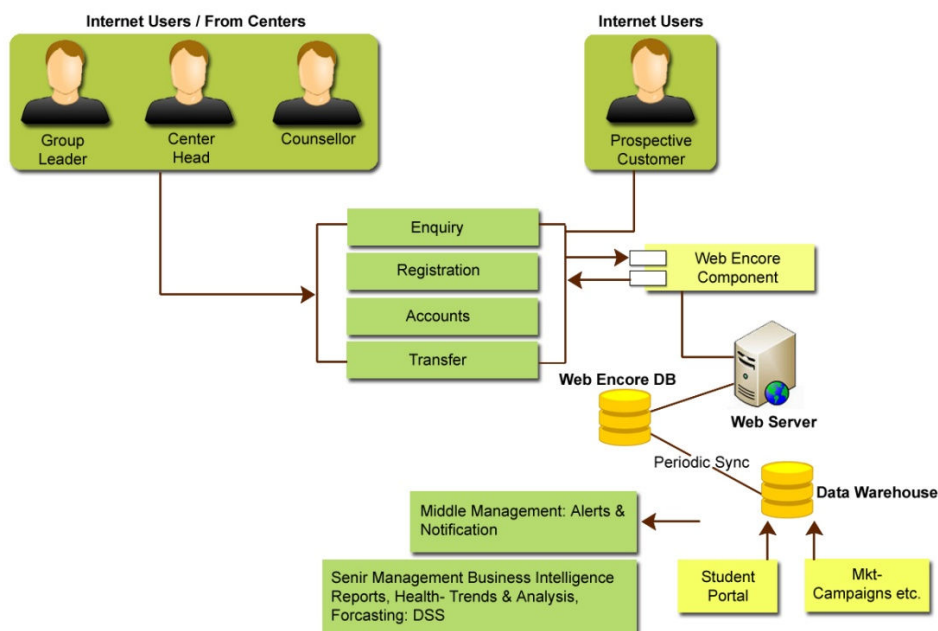


Illustration 1: Encore System Workflow

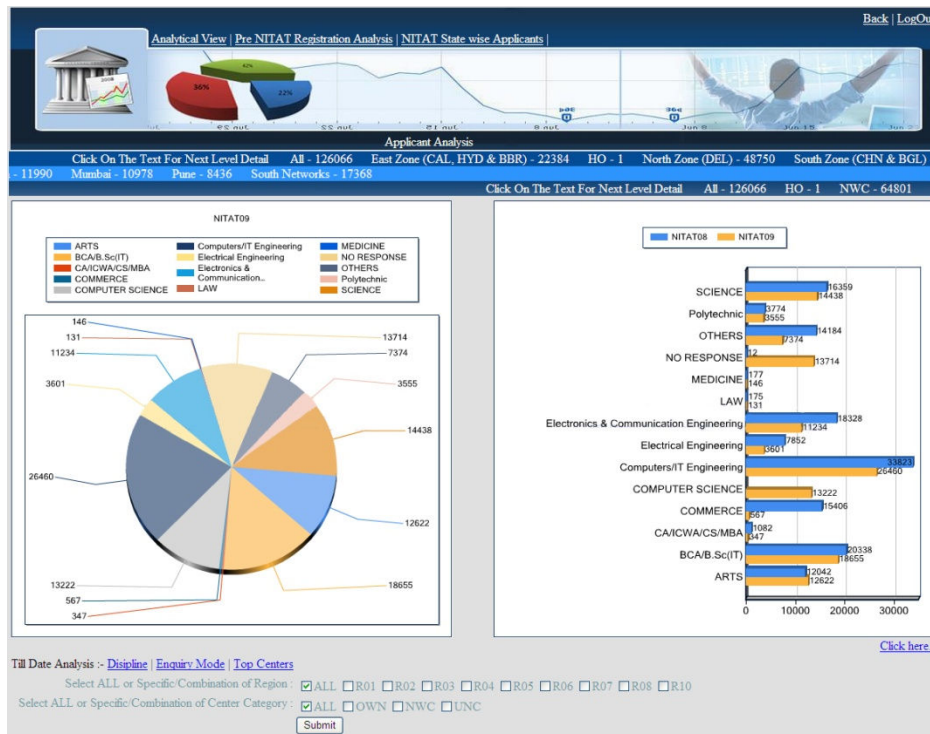
## How does it work?

Throughout each of its departments, NIIT performs an assessment and needs analysis of key performance areas which will drive future decisions. Through BI tools, it identifies KPIs, including revenue, operating margins, data trends, management and employee performance, customer inquiries and demands, and overall customer satisfaction based on feedback received. By regularly updating these BI tools to align with the company's evolving business needs, NIIT has essentially become its own BI client. After gaining an understanding of how to best leverage these tools across departments to improve performance, NIIT is poised to develop and integrate proven BI tools into its clients' technological solutions.

In essence, what began as an in-house imperative to better understand its own business has evolved into NIIT's mission of enabling colleges and universities to glean important insights to assess institutional performance and create robust solutions to drive enrollment, increase retention, and improve the way faculty and administrators view and respond to information.

NIIT is working in partnership with colleges and universities to change the BI landscape for the educational sector by providing the missing link that will help faculty and administrators

understand and adapt to changing trends while identifying new opportunities for growth. Below are illustrations of customized NIIT dashboards that are used in an increasing number of colleges and universities to review data trends on a day-to-day basis.



**Illustration 2: Dashboard to review number of enrollments and its distribution across students coming from different streams.**

The above dashboard depicts the number of enrollments across all NIIT campuses and its distribution across the different educational streams that the students are coming from, like science, engineering, commerce, etc.

This provides valuable information to determine the type of students to which the current programs appeal and do not appeal. Hence more customized programs for that student category can be developed.



**Illustration 3: Dashboard to review regional distribution of enrollments across the country**

This dashboard depicts the current enrollments across all the NIIT campuses for different regions in India, and also its comparison with respect to last year. All the regions are hyperlinked so they can be referred in case more details are required for a specific region.

Again, these trends provide further details that help establish which regions are doing good business and why and how this can be replicated across non-performing regions.

## Intelligence in Action

With almost three decades of experience and a suite of proprietary products engineered specifically for the education market, NIIT is a preferred vendor for several leading institutions of higher learning. That's why one prominent institution called on NIIT for help with its BI planning and integration. The educational company wanted to enhance and provide consistent data across its extensive network, in addition to improving collaborative reporting. NIIT performed an in-depth analysis of current operations, data governance, key performance indicators, BI readiness, and overall goals during its discovery phase. This data informed a roadmap upon which the institution could successfully integrate and realize results through BI, thereby transforming the reporting experience from Standard Reports towards Predictive Modeling.

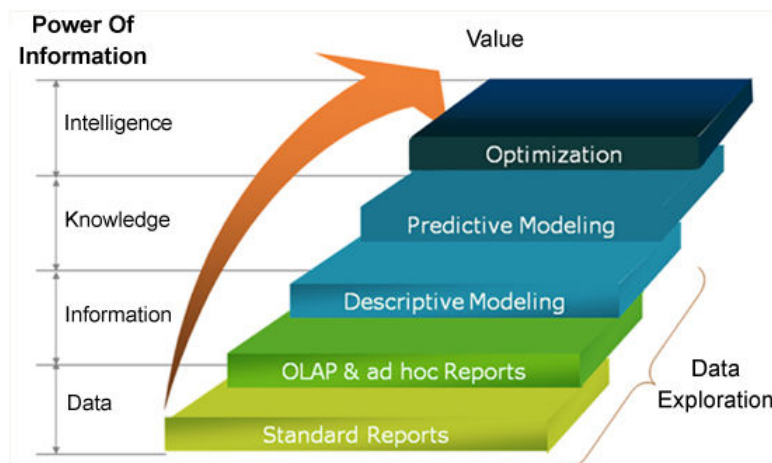
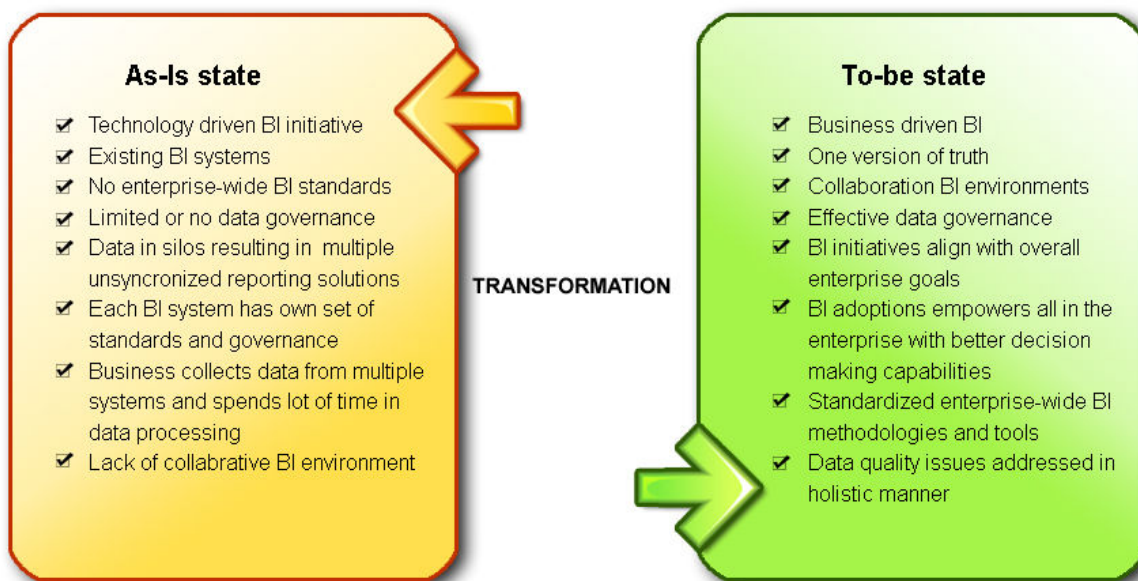


Illustration 4: Power of Information

Essentially, NIIT put the institution in a business context, thereby highlighting how it could improve efficiency, enhance operations, and become more competitive in the educational sector—delivering not just the technology, but also the consulting to ensure specific and viable solutions for the institution’s unique scenarios. By getting the right information to the right people at the right time—crucial ingredients in achieving success—NIIT was able to help their educational client capture unrealized opportunities and significantly improve performance.



**Illustration 5: NIIT uses its Best Practices to aid the transformation from the current data reporting systems to build fully integrated BI solutions.**



## Future of Intelligence Decisions

Perhaps the only constant in BI is change. There are several factors contributing to projected trends, namely those related to economic conditions, including Open Source data integration and data warehousing to decrease total cost of ownership (TCO), integration of social networking tools such as mashups, and richer and more flexible dashboards. Overall, the greatest demand for BI lies in simplifying the technology and allowing for more efficient data warehousing operations.

As one article puts it, “We will see more implementation of BI to improve BI.”<sup>1</sup> That is, BI systems will check on BI technologies to ensure that workload is efficiently managed to meet the demands of ever-escalating amounts of data. In addition, BI trends analysis experts indicate that BI will continue to “connect the dots” between data to derive better relational understandings. These, in turn, will enable improved risk assessments and a deeper understanding of consumers—or, in the educational context, students—in real-time via data and text alerts.

Business Intelligence is only, if you will, getting *smarter*. The recent economic turbulence exposed vulnerabilities in many businesses that may have been successfully averted—or at the very least, braced for—had executives scrutinized processes in such a way that revealed risks in all market conditions. Institutions of higher education, responsible for producing the next generation of leaders, need to take a look at the most fundamental level of their organizations to make vast institutional changes that adapt to these trends and intelligently launch initiatives that will assess risks, identify opportunities, and capitalize on ways to improve operations. Change happens fast—and adopting now is the only way they can continue to remain viable in a more competitive, connected, and technologically advanced world.



## Top 7 Tips for Deploying Effective and Profitable BI Solutions

### 1. Identify & Plan

Define your institutional goals and objectives to see where BI will be most helpful. While doing so, find out what kinds of tools faculty and administrators need to improve data collection, reporting, and assessment. Director of new equipment systems from its elevator puts it this way in the business context: “If [businesses] don’t have a very clear idea of what the end result is supposed to be, they should never start.”<sup>15</sup> The same principle applies to institutions of higher learning.

### 2. Align

Establish consistency across data and common data names to avoid redundancy of information and any possible confusion. Also ensure that you determine true data from one source, and identify which tools will best help each user. This kind of organization up-front can reduce frustration and the need to refine processes down the road. As James Young, senior financial systems analyst for book publisher Simon and Schuster, points out, this step is vital: “Otherwise, you’ll constantly be patching and trying to make up for that initial mistake.”<sup>15</sup>

### 3. Partner

A single platform with a common set of integrated tools will facilitate efficient BI usage across any organization. Research vendors that understand the pain points and objectives of your institution—and the educational sector as a whole—to establish a solid BI foundation that will help you realize your unique goals.

### 4. Integrate

Set up a holistic BI solution that works seamlessly with your current systems. Tight integration will help ensure operational efficiency and peak performance.

### 5. Train

Before you begin using BI tools and systems, it’s best to train all potential users. Your chosen vendor should have experts who are knowledgeable about your system and needs so they can help faculty and administrators understand the best ways to maximize your BI applications.



## 6. Test

Once your users are trained and systems implemented, it's wise to test out BI in various contexts to see whether it meets the needs of your faculty and staff, and pinpoint any areas that require improvement. Remember, BI is commonly implemented in stages, and it's crucial to assess each step for optimal performance.

## 7. Continual Assessment

Periodically review your BI systems and processes—particularly if your institutional goals change. Ensure that your BI vendor is there to help you for maintenance and ongoing support issues, and it updates your system to meet your evolving needs.



## Conclusion

Poor intelligence leads to poor decisions. That is why it is crucial, particularly in an increasingly competitive market, to develop core insights that allow institutions to see their organization from one “truth level.” This exposes authentic data and reveals where there is room for improvement. With BI, colleges and universities will be empowered to recruit, attract, and retain the most qualified applicants with targeted campaigns and in-class performance assessment, look into course applicability in the business context to develop and deploy better classes that meet students’ changing needs, analyze geodemographic trends and course and site capacity to strategically arrange for and install structures that best support them, assess risks and benefits for launching new programs and initiatives, and provide a holistic view of finances and operations to make adjustments that improve the institution as a whole.

NIIT, with a vast body of work and tools designed for education, will help institutions tap into hidden opportunities, realize the potential to maximize ROI and emerge as leaders that adapt to shifting socioeconomic and technological realities. After all, it is imperative to evolve, for as newspapers, the U.S. military and multinational companies have indicated, there is only one option amidst a culture of change: Adapt or die.<sup>16, 17</sup> It is only a matter of time before this axiom pervades the field of higher education.

For more information on NIIT Business Intelligence for Higher Education, please contact [Svenkat@niit.com](mailto:Svenkat@niit.com).



## About NIIT

*NIIT's Enterprise Learning Solutions Company delivers innovative strategies that help clients accelerate business impact. Our clients count on our Managed Training Services specifically in the areas of advisory and learning services, technology tools, and custom content to optimize their learning organizations and to improve time to performance for employees, customers and partners.*

*We use cutting-edge instructional design and our Critical Mistake Analysis method to deliver award-winning solutions, technology and services. Together with our subsidiaries, Cognitive Arts and Element K, our Global Talent Development programs help clients achieve real-world skills to better compete in today's market.*

*Established in 1981, NIIT is known globally as the number one choice for strategic learning solutions. We proudly partner with the world's leading education, technology, publishing and Fortune 500 companies. NIIT has won over 40 awards, including 12 Brandon Hall awards.*

## About Venkat Srinivasan

*Venkat Srinivasan has over 15-years experience in business strategy, new business development, strategic relationship management, and operations in the education and training industry. His insight into the business of higher education, and experience designing and developing learning and student retention solutions for institutions truly set him apart from others in his field. Venkat started out as part of the NIIT faculty, and went on to design and develop various new programs, including increasing student retention and reducing attrition rates by 50%. Venkat currently holds the position of Vice President at NIIT.*

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