



# Turning Business Intelligence (BI) into Institutional Intelligence (I<sup>2</sup>)

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## Higher Education Institutions in the US

1

There are nearly 3,500 colleges and Universities in the US

- large and small
- public and private
- research and non-research
- land grant
- parochial and non-parochial
- medical and teaching hospitals
- multi- and single campus
- physical and online campuses
- etc. ...

1. A.T. Still University of Health Sciences
2. Aakors Business College - Online
3. Abilene Christian University
4. Abraham Baldwin Agricultural College
5. Academy Of Art University
6. Academy of Oriental Medicine at Austin
7. ACCIS
8. Accutech Career Institute
9. Adams State College
10. Adelphi University
11. Adirondack Community College
12. Adler Graduate School
13. Adler School of Professional Psychology
14. Adrian College
15. Agnes Scott College
16. <sup>\*\*\*</sup> College of Business
3462. <sup>\*\*\*</sup> College
3463. Xavier University
3464. Yakima Valley Community College
3465. Yale University
3466. Yavapai College
3467. Yeshiva University
3468. York College
3469. York College
3470. York College of Pennsylvania
3471. York County Community College
3472. York Technical College
3473. Young Harris College
3474. Youngstown State University
3475. Yuba College
3476. Zane State College
3477. Zion Bible Institute

source: UnivSource (www.univsource.com)

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There are nearly 3,500 colleges and Universities in the US.

But fewer than 100 are listed by the EDUCAUSE Decision Support & Data Warehousing Constituent Group.

Does this really mean that the Higher Education rate of adoption is less than 3%?

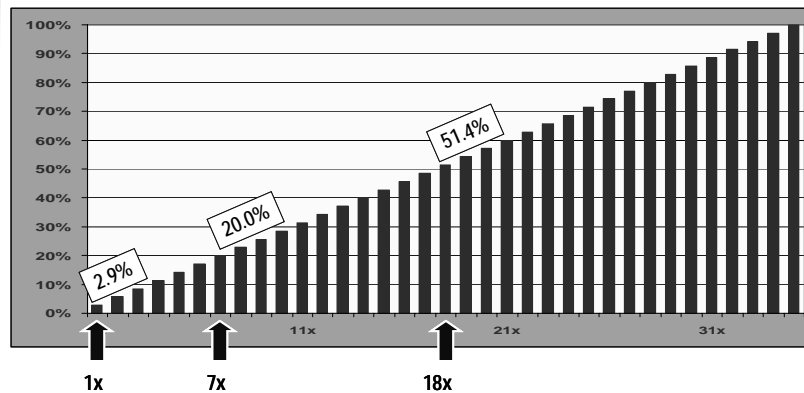
- Andrews University
- Arizona State University
- Baylor University
- Boston College
- Brown University
- California Community Colleges
- California State University
- California State University at Hayward
- California State University, East Bay
- Case Western Reserve University
- Case Western Reserve University, School of Medicine
- Central Queensland University
- Columbia University
- Cornell University
- Davidson College
- DePaul University
- Desert Research Institute
- Duke University
- Emory University
- Fort Hays State University
- Virginia Commonwealth University
- Virginia Tech
- Washington College
- Washington State University
- Williams College
- Yale University
- York University

source: EDUCAUSE Decision Support & Data Warehousing Constituent Group

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**Business Intelligence (BI)**

“The processes, technologies, and tools needed to turn data into information, information into knowledge, and knowledge into plans that drive profitable business actions ...”

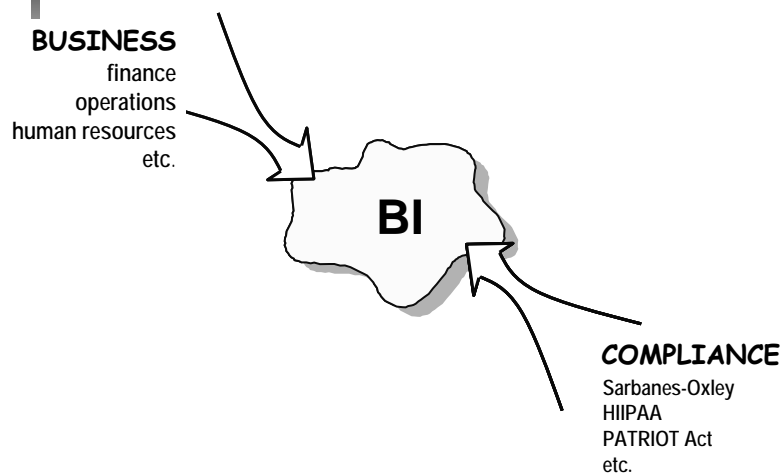
David Loshin  
*Business Intelligence: The Savvy Manager's Guide* (Addison Wesley, 2003)

**Institutional Intelligence (I<sup>2</sup>)**

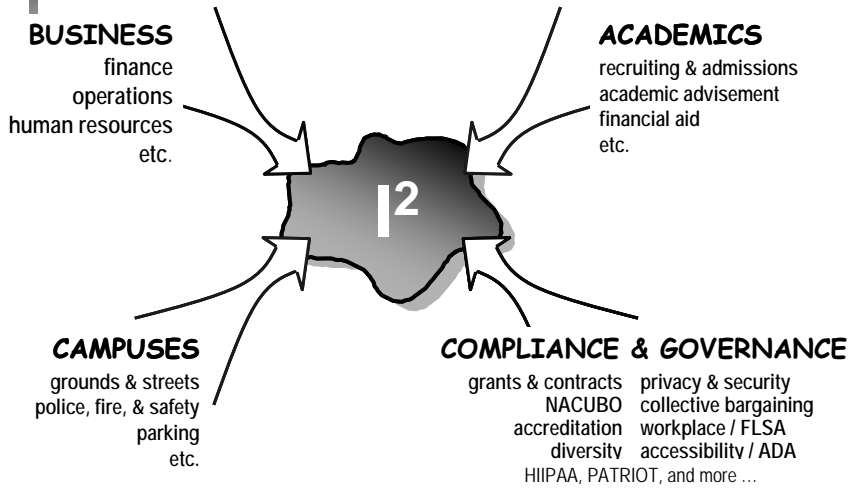
“the capacity of an institution to carry out analyses on questions of strategic import under continuously changing conditions ...”

Debra Friedman  
 Dean, College of Public Programs, Arizona State University

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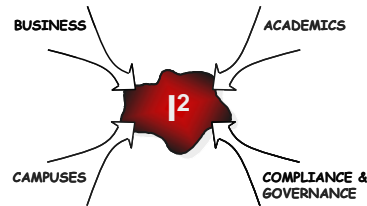


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- Performance Measurement
- Program Planning
- Performance Reporting
- Accountability
- Performance-Based Budgeting



## Institutional Performance Mgmt

**“It is reasonable to expect that higher education today should be able to establish clear goals; develop benchmarks and strategies to achieve those goals; report performance toward achieving goals; and create a mechanism to use that performance information to improve activities.”**

Mark Musick, President  
Southern Regional Education Board (SREB)

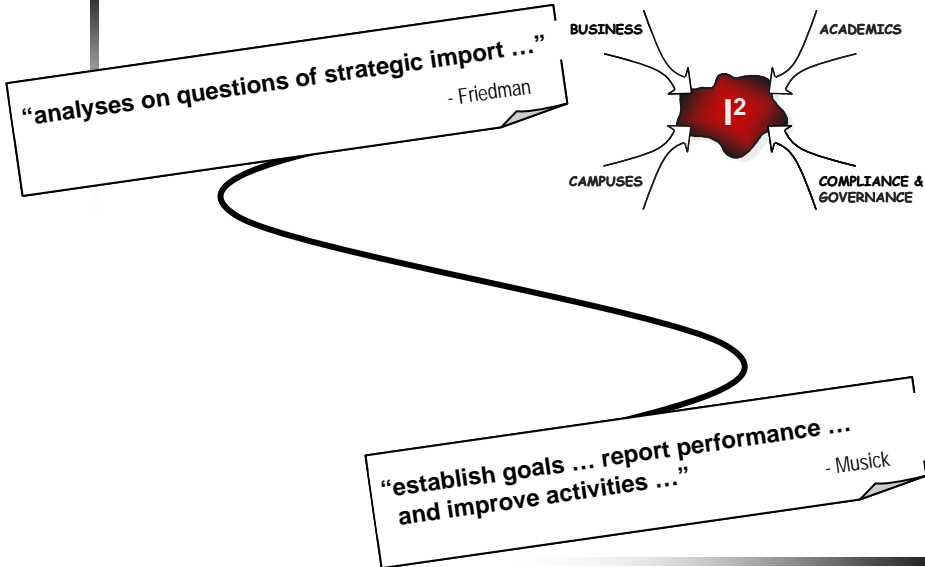
adapted from: *Measuring Performance in Higher Education*, State of Tennessee, 2001

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## Strategic Intelligence in Higher Education

7.1



adapted from: *Measuring Performance in Higher Education*, State of Tennessee, 2001

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## Strategic Intelligence in Higher Education

7.2

These are some Education examples ...  
What about Research? Service? Community?

### PREPARATION

How well do we prepare prospective students to be eligible for and to benefit from higher education opportunities?

### PARTICIPATION

How well does the institution perform in providing opportunities for undergraduate and post-graduate education?

### AFFORDABILITY

How affordable is higher education for students and their families?

### PERSISTENCE & COMPLETION

How well do students persist toward and complete attainment of degrees?

### COMMUNITY GAINS & RETURNS

What are the economic and civic benefits of a highly educated population?

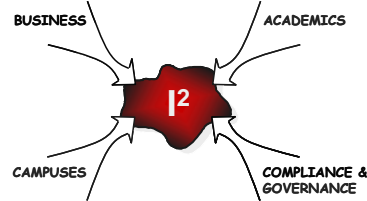
### INDIVIDUAL & FAMILY VALUE

What are the economic and sociological benefits of education students and their families?

adapted from: *Measuring Performance in Higher Education*, State of Tennessee, 2001

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- Enrollment/graduation rates by gender, ethnicity, and program
- Degree completion and time to degree
- Persistence/retention rates by grade, ethnicity, and program
- Remediation activities and effectiveness
- Student satisfaction
- Pass rate of professional exams
- Transfer rates to and from 2- and 4-year institutions
- Job placement / job satisfaction of graduates
- Faculty workload and productivity in the form of student-to-faculty ratios and instructional contact hours
- Faculty quality measured as academic credentials, publications, and awards
- Accessibility to underserved / underrepresented groups
- Comparative cost relative to peer institutions
- Comparative research funding relative to peer institutions
- Financial aid availability and utilization
- Collaborative activities with K - 12 systems
- Economic and workforce development activities



adapted from: *Measuring Performance in Higher Education*, State of Tennessee, 2001

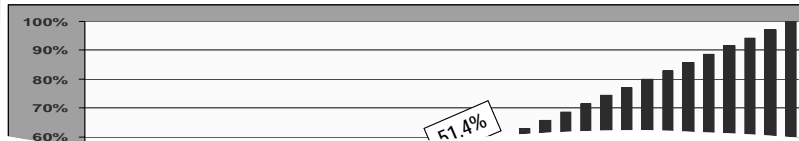
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Indicator	Us	Peers
Percent of family income paid as college expenses	19%	17%
Percent of income that poorest families pay as college expenses	23%	19%
Percent of family income paid as tuition	16%	18%
Percent of income that poorest families pay as tuition	23%	19%
Percent of grant aid targeted to low-income families	33%	28%
Average loan amount borrowed by a student annually	\$3690	\$3094

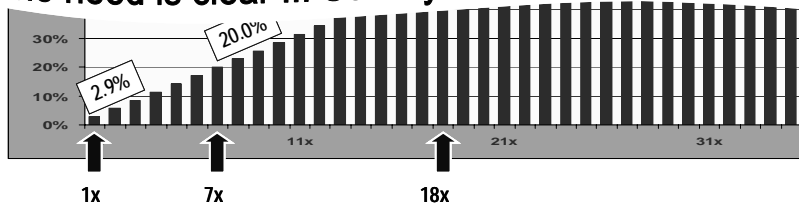
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There are nearly 3,500 colleges and Universities in the US

But fewer than 100 are listed in the EDUCAUSE  
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The need is clear ... So why the low adoption rate?



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#### ***Variable metrics and measures***

A typical business has relatively stable key performance indicators and essential business metrics. A higher education institution experiences virtually unlimited variation in metrics of success.

#### ***Volatile goals and strategies***

Business cultures routinely have continuity and clarity of goals and strategies that is achieved through directed agenda setting for the business. An institutional culture typically works with distributed agenda setting, resulting in multiple, overlapping, and constantly evolving goals and strategies.

#### ***Shifting subjects of information***

Where a typical business has relatively stable customers and markets, students, faculty, and academic environments change continuously.

#### ***Unpredictable information consumers***

A mature BI program is able to optimize for known communities of interest with relatively predictable information and problem-solving needs. Higher education communities are diverse and volatile with ever-changing questions and problem-solving needs.

**Enterprise Orientation**

Higher Education institutions aren't a single enterprise ... Enterprise-oriented approaches not easy to apply ... Competing "fiefdoms" with different versions of the truth ... Reluctance to accept standards ... Many areas (those with resources) have shadow systems that are difficult to incorporate or reconcile

**Modeling**

No good industry standard models for higher ed ... Hard to find a starting place ... Best-practices models not being shared ...

**Politics**

Aggravated by academic and administrative computing priorities ... Creates sponsorship and funding conflicts ... Adds complexity to priority-setting and decision-making

**Technology**

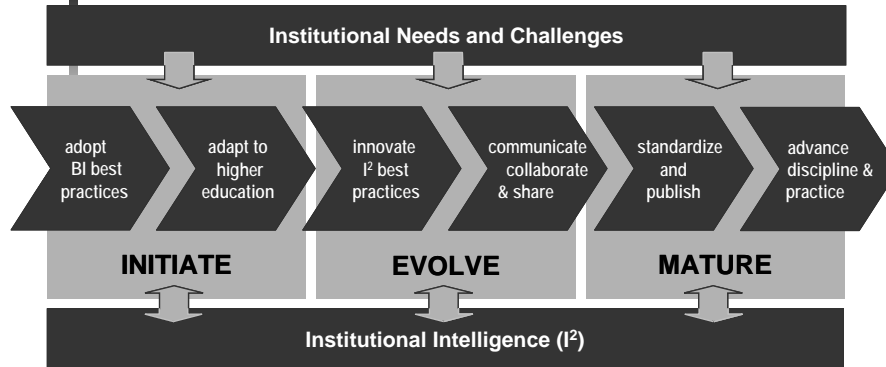
Variety and disparity of desktop workstations is typical in higher ed ... "Home grown" technology common in research schools incompatible with commercial tools ... Wide gap between leading and trailing edge of technologies used for systems and data

**Staffing and Skills**

Higher Education institutions rarely have administrative and IT staff with BI experience and expertise ... Budgetary and other constraints make it difficult to compete with corporate America for the expertise ... Overhead of maintenance and support rapidly consumes people and erodes development groups

**Data Governance**

Delivering large amounts of data and information to a wide and diverse audience ... Stratification: getting the right data (and the right views) to each person ... Over protection, territorialism, and "my data" attitude inhibit sharing ... Lack of consensus and consistency of data definition and usage



## PARTICIPATE:

- ✓ Higher Education Data Warehousing Forum (HEDW) [www.ds.uillinois.edu/hedw/index.html](http://www.ds.uillinois.edu/hedw/index.html)
- ✓ EDUCAUSE Decision Support/Data Warehousing Constituent Group [www.educause.edu](http://www.educause.edu)

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# Thank You!

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## EDUCAUSE Decision Support/Data Warehousing Constituent Group

Andrews University	University of Akron
Arizona State University	University of Arizona
Baylor University	University of California Los Angeles
Boston College	University of California San Diego
Brown University	University of California Santa Cruz
California Community Colleges	University of Cincinnati
California State University	University of Connecticut
California State University at Hayward	University of Idaho
California State University, Hayward-S390 Focus Data Warehouse	University of Illinois
California State University, East Bay	University of Kansas
Case Western Reserve University	University of Maryland
Case Western Reserve, School of Medicine	University of Miami
Central Queensland University	University of Michigan
Columbia University	University of Minnesota
Cornell University	University of Nebraska
Davidson College	University of Nevada, Reno
DePaul University	University of New Mexico
Desert Research Institute	University of New Mexico
Duke University	University of New Mexico
Emory University	University of Notre Dame
Fort Hays State University	University of Osnabrueck/Germany
George Mason University	University of Rochester
George Mason University	University of Tennessee, Knoxville
George Washington University	University of Texas at Austin
Georgetown University	University of Texas at San Antonio
Georgia Southern University	University of Utah - Health Sciences Center
Harvard University	University of Virginia
Indiana University	University of Washington
Indiana University Of Pennsylvania	University of Western Ontario
Ithaca College	University of Wisconsin - Madison
Jaypee Institute of information technology	University of Wisconsin - Stout
KCTCS - Kentucky Community & Technical College System	University of Wisconsin, Milwaukee
Loma Linda University	US Naval Academy
MIT	Utah State University
North Carolina Central University	Virginia Commonwealth University
North Dakota University System	Virginia Tech
Northeastern University	Washington College
Ohio University	Washington State University
Oklahoma State University	Williams College
Oregon State University	Yale University
Penn State University	York University
Pennsylvania State System of Higher Education	
Purdue University	
Rensselaer Polytechnic Institute	
Rhode Island College	
Saint Francis Seminary	
Stanford University	
Syracuse University	
Texas A&M University System	
Trinity College	
Tufts University	

# **Institutional Intelligence: Applying Business Intelligence Principles to Higher Education**

by David L. Wells, TDWI Director of Education

Higher education, generally among the leaders in technology adoption, is late to embrace data warehousing and business intelligence (BI). While there are nearly 3500 universities, colleges, and community colleges in the US<sup>1</sup>, fewer than 100 have recognized data warehousing programs<sup>2</sup>. This represents an adoption rate of less than three percent for a discipline well into its second decade of mainstream practice!

Does BI not work for higher education? Or does it simply not apply? The answer to both of these questions must be a resounding “NO!” The principles of BI do apply, and the capabilities of BI are critical to institutional success. The importance and the value of data warehousing and BI are recognized by leading institutions such as the University of Illinois, Northwestern University, Rensselaer Polytechnic Institute, University of Texas at Austin, and California State University.

## **The Need for Institutional Intelligence**

The need for data integration, institutional metrics, and higher education analytics is apparent and unarguable. Debra Friedman<sup>3</sup> describes a need for institutional intelligence – “the capacity of an institution to carry out analyses on questions of strategic import under continuously changing conditions.” BI principles apply throughout the strategy, planning, management and operation of a college or university. Every institution must address all of the typical business management disciplines: financial management, operations management, human resources, and the like. But institutions of higher education are more complex than most businesses. While encompassing all of the traditional aspect of business, they must also measure and manage uniquely academic issues and processes such as admissions, financial aid, academic advising. Many colleges and universities oversee resources and activities similar to those of a municipal government, with campus police, fire and safety, traffic management, parking services, etc. Add to this the similarities with the hospitality industry – residence halls, dining services, meeting facilities, etc. – and the complexity is magnified.

Also consider the dimension of regulatory compliance. Environmental, privacy and security, workforce regulations, accessibility, diversity, collective bargaining agreements, grants and contracts, and more make up the landscape of institutional compliance considerations. Although the Sarbanes-Oxley Act of 2002 (SOX) does not apply to higher education and other public or not-for-profit entities, the National Association of College and University Business Officers (NACUBO) has issued guidelines related to the issues raised by SOX. Though not directly impacted by Sarbanes-Oxley, institutions must still attend to issues such as auditor independence, corporate responsibility, enhanced financial disclosures, accountability, and certification of financial results.

Beyond these general needs that apply to virtually every institution are issues and needs unique to various kinds of institutions. Research One universities have specific demands and requirements. Those with medical schools have special demands in compliance and many other areas. State regulated institutions, land grant schools, community colleges, parochial schools, and multi-campus schools all have divergent needs.

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<sup>1</sup> source: [www.univsource.com](http://www.univsource.com)

<sup>2</sup> source: EDUCAUSE Decision Support/Data Warehousing Constituent Group

<sup>3</sup> Debra Freidman, Dean, College of Public Programs, Arizona State University

## The Challenge of Institutional Intelligence

Why, then, the low rate of adoption? With the need so great, what is it that prevents most colleges and universities from embracing the concepts of business intelligence and implementing institutional intelligence programs? Scope and complexity are certainly barriers to entry. To simultaneously address needs of academics, administration, municipality, hospitality, compliance, etc. seems an overwhelming effort. Yet institutions know well the disciplines of incremental implementation – the practice of start small and grow systematically.

Beyond scope and complexity lie challenges that are unique effects of the institutional culture and environment in which BI principles must be adopted and adapted to become institutional intelligence. Four key areas where institutional intelligence is distinguished from business intelligence are:

- *Variable metrics and measures* – A typical business has relatively stable key performance indicators and essential business metrics. A higher education institution experiences virtually unlimited variation in metrics of success.
- *Volatile goals and strategies* – Business cultures routinely have continuity and clarity of goals and strategies that is achieved through directed agenda setting for the business. An institutional culture typically works with distributed agenda setting, resulting in multiple, overlapping, and constantly evolving goals and strategies.
- *Shifting subjects of information* – Where a typical business has relatively stable customers and markets, students, faculty, and academic environments change continuously.
- *Unpredictable information consumers* – A mature BI program is able to optimize for known communities of interest with relatively predictable information and problem-solving needs. Higher education communities are diverse and volatile with ever-changing questions and problem-solving needs.

These are certainly not the only challenges an institutional intelligence program will face. There are sure to be more in many domains: economic, cultural, political, and technological. Yet this represents a road already traveled – issues faced by every business that has implemented a BI program. The problems are known and the solutions are found in BI best practices.

## Adopting Institutional Intelligence

Building an institutional intelligence program is an undertaking of real magnitude. It is a journey (not an event) that demands vision, commitment, and tenacity. A successful program is both mission-aligned and culturally aligned. For higher education institutions, mission-aligned means connected with and supporting the education, research, and service objectives of the institution. Thus the dashboards, scorecards, metrics, measures, and data have distinctly different focus than those of a typical business intelligence program. Cultural alignment has both organizational and terminology implications. Program sponsorship, program management, and decision-making processes will all need to be adapted – to discover and develop best practices for institutional intelligence. The language used to describe an institutional intelligence program must also be adapted. While institutions have revenue and expense, profit and loss, they are less significant than in for-profit business culture. They are not the driving forces in which meaningful measures of mission achievement are found.

Institutional intelligence is on the horizon. Getting started requires substantial knowledge of business intelligence principles, combined with innovation that adapts them for institutional needs and challenges. To know and understand BI principles, study that which has been done by the

most successful businesses. To adapt for higher education, become part of the small but growing community that is collaborating to discover and define institutional best practices.

The need is great, the challenges conquerable, and the rewards immense. Institutional intelligence is part of the future of higher education. Intelligence will pay off on many fronts: to recruit and retain the very best students, to recruit and retain top-quality faculty, to stand out in the crowded field of commodity education, to lead prestigious research projects, to deliver high-impact research results, to contain tuition costs, to maximize the value of the college experience, to avoid the risks inherent in regulatory compliance, and to advance the reputation and public perception of the institution. Institutional intelligence is undeniably challenging. Those who step up to the challenges will be well-positioned as tomorrow's leaders in higher education.