Using Common Actionable Intelligence Tools to Better Inform Decisions and Change the Campus Data Culture

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University at Buffalo (UB)
Institutional Analytics Team

2019 Commission on Information, Measurement and Analysis Summer Meeting → Wayne State University
Presentation Topics:

● UB’s Structure for Analytics Delivery
● EAB Posting/Article on UB Analytics
● Changing Data Culture (Who? How?)
● Analytics Example Tools/Dashboards
University at Buffalo (UB) 
Institutional Analytics
Using Common Actionable Intelligence Tools to Better Inform Decisions and Change the Campus Data Culture

UB Institutional Research Office (OIA)

- Internal Reporting, Effectiveness, Surveys
- Official Reporting, Data Architecture, Infrastructure
- Data Analytics, Visualizations

*Added Fall 2016*
Aligns with the 2012 Association of Institutional Research (AIR) Statement of Aspirational Practice in Institutional Research:

↑ Data for Wide Range of Decision Makers
↑ Institution-wide Use of Data and Analytics
↑ Data-Informed Staff Decision Making
From: EAB Post on UB Analytics (January 2019)

How one university centralized BI talent to achieve maximum strategic impact

Expert Perspective | January 30, 2019
Administrative and academic leaders alike want to make better decisions based on high quality, actionable data. But while many institutions are making significant technology investments to improve data quality these investments are useless without staff who can access and analyze this data and communicate trends to leaders.
From: EAB Post on UB Analytics (January 2019)

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need staff with ability to effectively communicate trends to leaders
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From: EAB Post on UB Analytics (January 2019)

Time Spent on non-BI Activities
From: EAB Post on UB Analytics (January 2019)

Nearly 100% Time DEDICATED to Institution-wide Analytics and BI Development!
Buffalo is already seeing results from the central BI team. Highlights include:

- Data visualizations and dashboards
- BI as a data hub
- Improved data culture
- Silo-busting
What We Do (and Don’t Do)

Dashboard of Dashboards
The Dashboard of Dashboards (DoD) was developed to simplify users’ access to some key campus dashboard sets, without requiring them to navigate through lists of Tableau sites and projects. It serves as a “one stop” launch page for the current institutional analytics dashboards available to the campus.

Enrollment Modeling Tools
Increased understanding of the underlying impact metrics that drive changes in outcomes is a great first step. The reality is that numerous metrics have potential impact, and to different degrees, so where do you start? Enrollment modeling tools are available to the campus community that give users the ability to “turn dial” up or down on selected metrics to see the resultant outcome changes over multiple years.

Enrollment Projection Tools
In order to take actions for change, it is important to know where you are heading. Predictive tools allow users to get an advanced look at the future, and determine if they need to take additional or different actions to change the predicted outcomes. Understanding the underlying metrics that drive changes in outcomes allows for more informed planning and proactive decision-making.
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What We Do

UB Institutional Research Office (OIA)

Internal Reporting, Effectiveness, Surveys

Official Reporting, Data Architecture, Infrastructure

Data Analytics, Visualizations

Added Fall 2016

Institutional Analytics Toolkit: University at Buffalo Actionable Intelligence Dashboards via Tableau Server

What We Do

Headcount and Head-to-Credit-to-Revenue (HCR)

Course Enrollment Pattern Analysis (URC)

Tuition Revenue - Normalized to Current Rates

Graduate Admissions Dashboard Series

The WEDGE: Undergraduate Student Flow Tracking

Course Searched Capacity and Utilization

Tuition Revenue History (10-years, 12 metrics)

Enrollment Projections (Head and Tuition Revenue)

Undergraduate Model (5-year projections)

What We Do

Produced by Institutional Analytics - for questions, contact Brian O’Connor (645-0754, boa@buffalo.edu)

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3 Current Dashboard Examples:

- Key Metrics (10 Years, 12 Metrics)
- Student Flow Tracking (WEDGE)
- Enrollment Modeling (Heads/$)
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→ Wayne State University

Brian O'Connor

University at Buffalo

3 Current Dashboard Examples:

- Key Metrics (10 Years, 12 Metrics)
- Student Flow Tracking (WEDGE)
- Enrollment Modeling (Heads/$)

Wide Variety of Audiences

Summary vs. Drill-down

Reporting vs. Discovery

Operational vs. Strategic
UB Analytics Example Dashboard #1

Key Metrics (KPIs)

Potential Users:
President and Provost
Central Enrollment Management
Central Resource Management
Deans and Associate Deans
Department Chairs/Directors
Unit Business Officers
Example #1 → The Key Metrics Dashboard

Key Metrics History (Most Recent Ten Academic Years)

- **Undergraduate**
  - Incoming Cohort
  - Full Time Only

- **Graduate/Professional**
  - Incoming Cohort
  - Full Time Only

- **Personnel**
  - Ladder Faculty
  - Full Count
  - Non Tenure Track
  - Full Faculty Count

**Generated by UB Institutional Analytics.**
For questions, contact Brian O’Connor
645-0754, boconnor@buffalo.edu

1st row = undergraduate metrics, 2nd row = graduate & professional metrics, 3rd row = personnel metrics.
Credit hours and tuition revenue are shown for the full academic year, all other metrics are shown for fall only.
Tuition revenue is normalized by applying most recent tuition rates to credits in each term for fair comparison.
Example #1 → The Key Metrics Dashboard

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Key Metrics History (Most Recent Ten Academic Years)

Undergraduate Metrics Row

Graduate/Prof Metrics Row

Personnel Metrics Row

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1st row = UNDERGRADUATE metrics, 2nd row = GRADUATE & PROFESSIONAL metrics, 3rd row = PERSONNEL metrics.
Credit hours and tuition revenue are shown for the full ACADEMIC YEAR, all other metrics are shown for FALL ONLY.
Tuition revenue is NORMALIZED by applying most recent tuition rates to credits in each term for fair comparisons.
Example #1 → The Key Metrics Dashboard

Key Metrics History (Most Recent Ten Academic Years)

Undergraduate Metrics Row
Revenue Source

Graduate/Prof Metrics Row
Revenue Source

Personnel Metrics Row
Primary Cost
Student Flow Tracking (WEDGE)

Potential Users:
- Central Enrollment/Retention Office
- Central and School Academic Advisors
- School Level Enrollment Managers
- Department Chairs and UG Directors
- Department Program Directors
- Students (???) ... Eventually

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Example #2 → The WEDGE Student Flow Visualization (Base View)

Undergraduate WEDGE Student Flow - FA '10 Freshmen Cohort (All)
Based on Data through March 6, 2019

Cohort Size 3152

Produced by Institutional Analytics - For questions, contact Brian O’Connor, 643-0754, boc@buffalo.edu
Example #2 → The WEDGE Student Flow Visualization (Base View)

Cohort population is tracked and marked with their TERM STATUS in each career term.
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Example #2 → The **WEDGE** Student Flow Visualization (Base View)

Still HERE

LEFT with Degree

LEFT without Degree

**Cohort Term Number**

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Example #2 → The WEDGE Student Flow Visualization (More Detail)

Still HERE, switched School

Still HERE, switched Levels

LEFT with Degree in DIFFERENT School

Cohort Term Number

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Example #2 → The WEDGE Student Flow Visualization (Most Detail)

- Shows specific school cohort students switched into.

- Cohort Term Number:
  - Cohort Term 1: 30%
  - Cohort Term 2: 32%
  - Cohort Term 3: 32%
  - Cohort Term 4: 30%
  - Cohort Term 5: 25%
  - Cohort Term 6: 24%
  - Cohort Term 7: 29%
  - Cohort Term 8: 29%
  - Cohort Term 9: 35%
  - Cohort Term 10: 35%
  - Cohort Term 11: 33%
  - Cohort Term 12: 33%
  - Cohort Term 13: 32%
  - Cohort Term 14: 32%

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Example #2 → The **WEDGE** Student Flow Visualization (Source Data)

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Source data for the dashboard are **INDIVIDUAL** student records by term#

### Incoming Doctoral Cohort Term Status

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**Legend:**
- **Doctoral Degree**
- **Masters Degree**
- **Currently Enrolled - One Credit**
- **Left without Degree**
- **Currently Enrolled - Doctoral**
Example #2 → The **WEDGE** Student Flow Visualization (Source Data to Aggregate)

Source data for the dashboard are **INDIVIDUAL** student records by term#

The standard WEDGE viz is just the aggregated result for these individual students

### Incoming Doctoral Cohort Term Status

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<tr>
<th>Student ID</th>
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- **Doctoral Degree**
- **Masters Degree**
- **Currently Enrolled - One Credit**
- **Currently Enrolled - Doctoral**
- **Left without Degree**

**Legend:**

- **40.5%**
- **22.7%**
- **22.7%**
- **15.0%**
Enrollment Modeling (Heads and $$)

Potential Users:
Central Enrollment Managers
Central Resource Managers
Central Admissions Office Director
School/Dept Enrollment Planners
Unit Business Officers / CFOs
CIO Campus Licensing Staff
Space Planning Office
Example #3 → The Enrollment Modeling Dashboard (4-year Heads and Revenue)
Example #3 → The **Enrollment Modeling** Dashboard (4-year Heads and Revenue)

Combines: Incoming **Freshmen Cohort** for the School and **Transfer Student Share** for School
Example #3 → The Enrollment Modeling Dashboard (4-year Heads and Revenue)

Combines: Incoming Freshmen Cohort for the School and Transfer Student Share for School and **WEDGE In/Out Headcount Rates**
Example #3 → The **Enrollment Modeling** Dashboard (4-year Heads and Revenue)

**Combines:** Incoming Freshmen Cohort for the School and Transfer Student Share for School and WEDGE In/Out Headcount Rates and **% of Student Revenue to the School** at Various Points in Student Career
Example #3 → The Enrollment Modeling Dashboard (4-year Heads and Revenue)

Combines: Incoming Freshmen Cohort for the School and Transfer Student Share for School and WEDGE In/Out Headcount Rates and % of Student Revenue to the School at Various Points in Student Career and Fall to Spring Revenue Ratios
Combines: Incoming Freshmen Cohort for the School and Transfer Student Share for School and WEDGE In/Out Headcount Rates and % of Student Revenue to the School at Various Points in Student Career and Fall to Spring Revenue Ratios to Generate 4-year Future Values for Fall Heads
Example #3 → The **Enrollment Modeling** Dashboard (4-year Heads and Revenue)

**Combines:** Incoming Freshmen Cohort for the School and Transfer Student Share for School and WEDGE In/Out Headcount Rates and % of Student Revenue to the School at Various Points in Student Career and Fall to Spring Revenue Ratios to Generate 4-year Future Values for Annual Tuition Revenue

* All revenue **NORMALIZED** for fair comparison *
Simple Summary

UB’s Institutional Analytics Team Mission is ...

To simplify the seemingly complex through promotion and delivery of actionable intelligence to a wide range of campus users. The intent is to allow for more proactive data-informed decision making from the departments to campus senior administrators, and everyone in between.
Thanks!
Brian O’Connor (boc@buffalo.edu)
http://www.buffalo.edu/provost/oia.html