



IMPLEMENTING A BUSINESS INTELLIGENCE (BI) PROJECT FOR STRATEGIC PLANNING AND DECISION MAKING SUPPORT

Office of Student Data, Analysis, and Evaluation (OSDAE) IUPUI
Michele Hansen, Steve Graunke, Janice Childress, Norma Fewell, &
Stephen Hancock

Enterprise Business Intelligence
Indiana University Technology Services (UITS) IU
Richard Shepherd & Namrata Zalewski



Overview

- New IR/Assessment office formed to support strategic planning
- Business Intelligence- What is it?
- Purpose of BI/Decision Support Project
- Technical Aspects
- Sharing Student Data Reporting Tools and Dashboards
- Partnership between IR and IT
- Lessons Learned
- Visions of the Future

Office of Student Data, Analysis, and Evaluation (OSDAE)

Vision Statement

- OSDAE will provide accurate and timely information to support **strategic planning decisions** about **enrollment management and student success and learning**. Using information from this office will allow greater coordination and alignment of activities to achieve maximum impact in regard to IUPUI's Strategic vision, mission, values, and campus strategies related to the success and learning of our students.

OSDAE Activities and Reports to Support Decision Making



Strategic Enrollment Management



Retention and Graduation



Assessment of Student Development and Learning



Student Surveys



Program Evaluation (assessing what works and is cost effective)

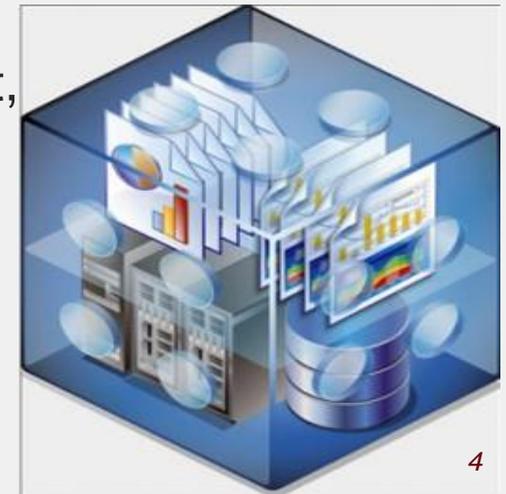


Mixed-Method Investigations (Qualitative and Quantitative Research Methods)



Business Intelligence (BI) in an Institutional Research Context

- Set of technologies and processes that help decision makers use data to understand and analyze institutional performance.
- Use of data-supported management to drive decisions and actions.
- It is getting the right information to the right people at the right time to support decision-making and institutional effectiveness.
- Broad term that encompasses what is referred to as the decision support environment, and including the data warehouse, reporting, and analytics.
- Enables better data storage, management, retrieval, and analysis.



Student Analytics Project Benefits

Enable Data
Exploration

- Reduce time from questions to answers
- Centralize business logic, moves it upstream
- Information closer to analysts and decision makers
- Analytics across subject areas

What is



Why, what if

Partnership Between IR and UITs

IR

- Institutional Context
- Anatomy of Decision Making
- Knowledge of Institutional Data Systems and Definitions
- Research, Program Evaluation, Assessment Expertise

UITs

- Project planning and coordination
- Knowledge of Technological Tools
- Dashboard and report development
- OLAP Cube Building MDX, ETL
- Enterprise wide vision

Student Analytics Deliverables

- SQL Server Analysis Cube integrated across multiple subject areas
- Tools for ease of analysis
 - Reports and dashboards
 - Tableau
 - SQL Server Reporting Services
- Metadata
- Knowledge transfer
- Training

A collaboration between IUPUI and UITS

OSDAE Website

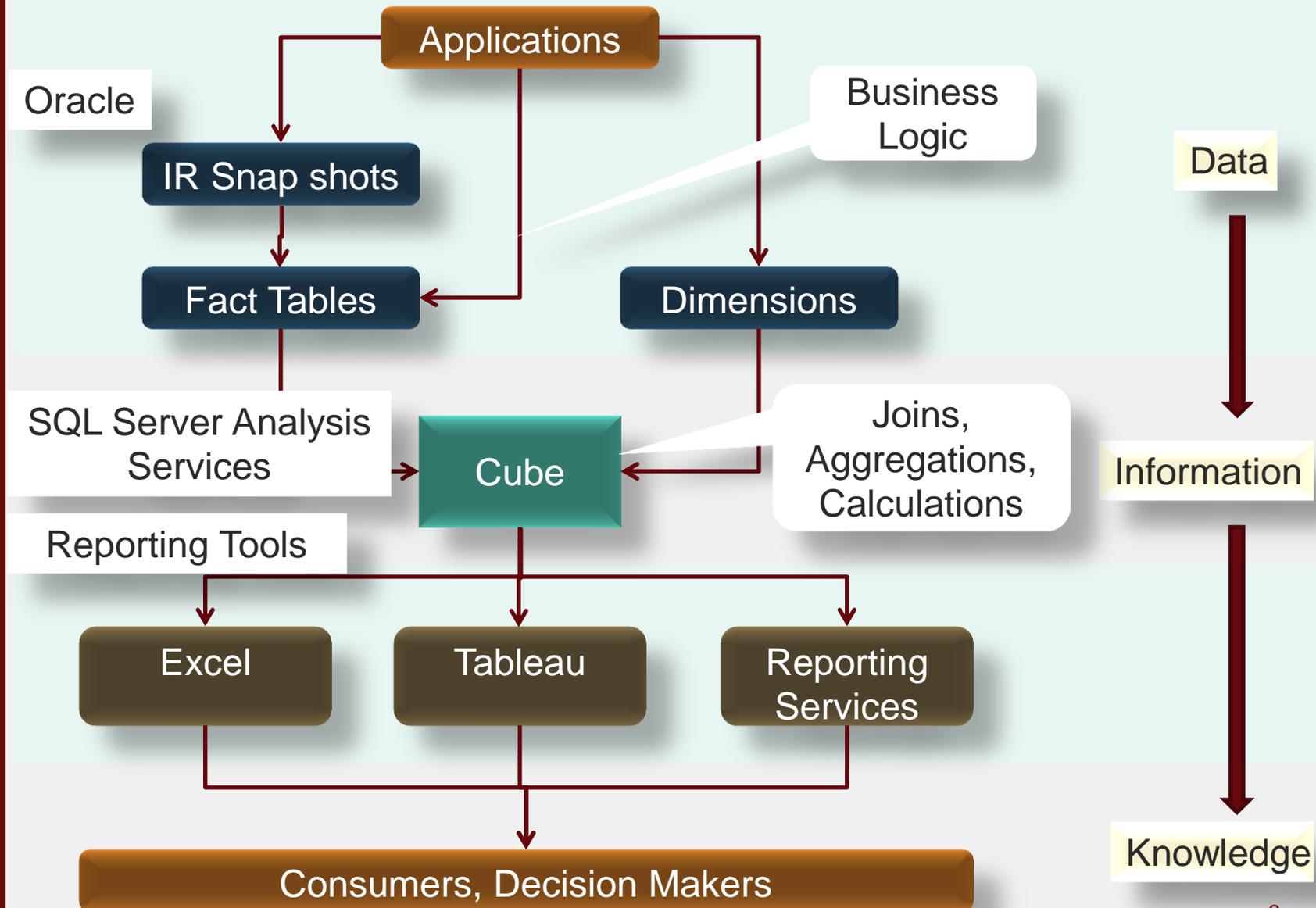
Access to all Student Data Reports and More!

<http://osdae.iupui.edu/>

Map link:

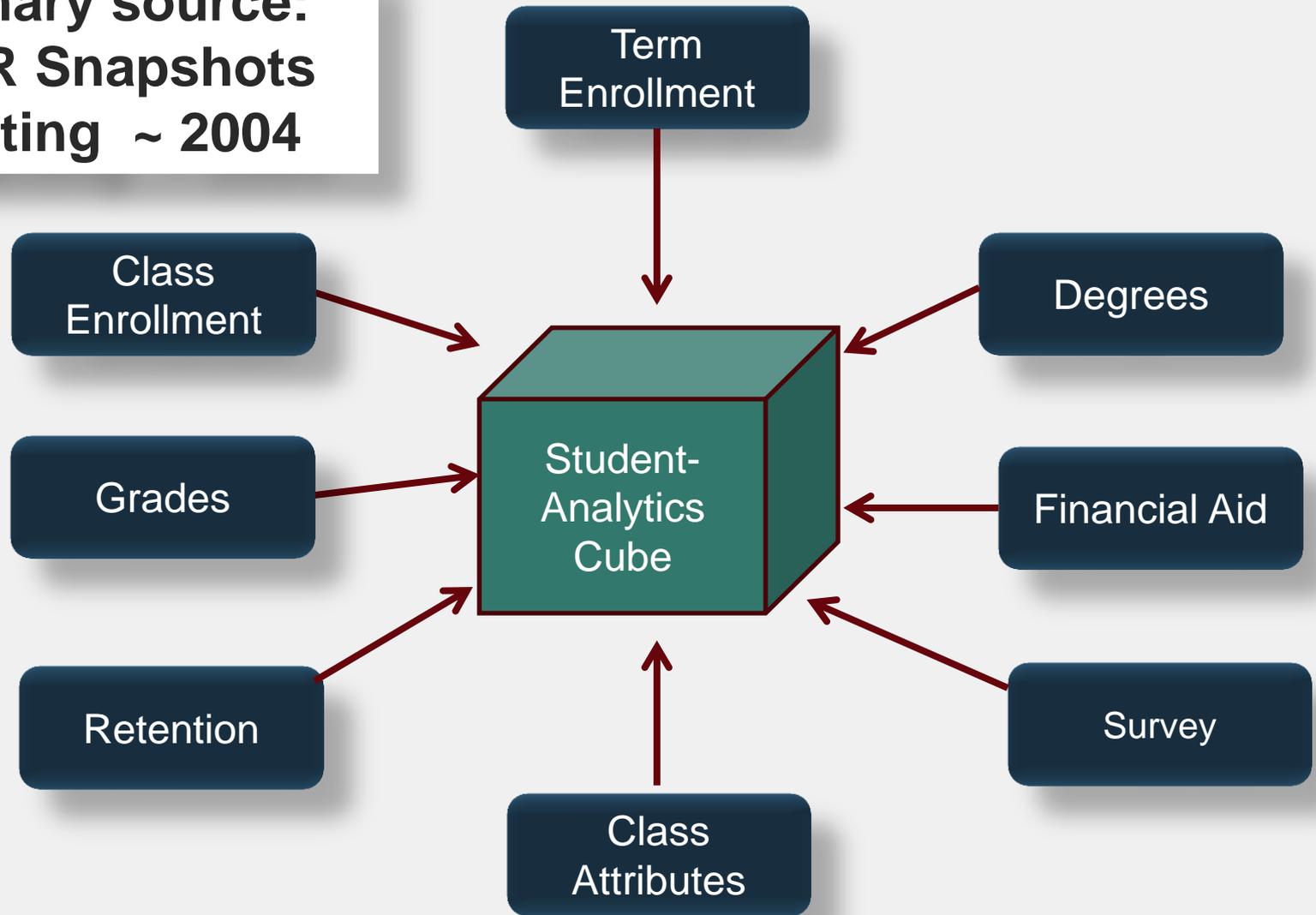
https://tableau.bi.iu.edu/t/prd/views/Enrollment_Maps/EnrollmentMaps#1

Data Flow, Transformation



Integrated Student Analytics Cube

**Primary source:
UIRR Snapshots
starting ~ 2004**

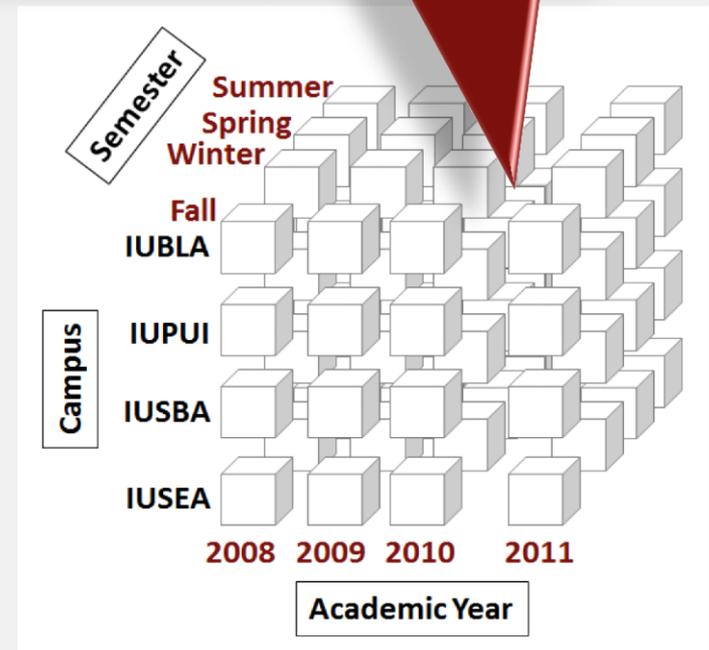


What is a Dimensional Cube?

A Cube is a set of related Measures and Dimensions that is used to analyze data:

- A Measure is fact, which is a transactional value or measurement that a user may want to aggregate
- Dimension is group of attributes and used to analyze measures in the cube

At each intersection of dimensions there are facts



Why build a Cube?

- **Good performance**
 - Aggregates and summarizes data
 - Response time for data retrieval is just a few seconds
- **Reinforces best practices**
 - Models data in the facts and the dimensions
 - Defines business logic
- **Allows multidimensional analysis**
 - Slice, pivot, rollup and drill down
- **Easy accessibility**
 - No extra tools are needed - Excel is sufficient
- **Minimum coding for analysts**
 - Pre-joined data
 - Complex logic built in

Student-Analytics Cube

Challenges	Approaches
<p>Large and complex cube</p> <ul style="list-style-type: none">Multiple subject areas joined and data didn't always align/matched as expectedCampus-specific logic	<p>Keep data design as simple as possible</p> <ul style="list-style-type: none">Define business process and logic early on
<p>Updates and maintenance</p> <ul style="list-style-type: none">SSAS database is built off cube, measures dimensions, data sources, security etc. All of these parts are closely connected and small change could cause issues	<p>Gaining in-depth knowledge of data design and cube components</p> <ul style="list-style-type: none">Documentation
<p>Data validation</p> <ul style="list-style-type: none">Cube data needs to be validated with every update and change	<p>Pre-spin cube data</p> <ul style="list-style-type: none">Compare and validate data after changes are implemented
<p>Issues with reporting tools</p>	<p>Acquiring knowledge of MDX and getting better understanding of reporting tools</p>

Data Tools Caveats

- Intended to be descriptive.
- Typically explaining *why* requires good research design and systematic inquiry.
- Not intended to replace requests for customized reports and more systematic investigations to understand why and how an intervention impacted student success and learning.
- Do not allow for causal inferences. Correlation does not mean causation.



Lessons Learned – Critical Success Factors...

- Good environmental scanning and understanding of key decision making, strategic plan metrics should guide project planning.
- Clear deliverables, specifications, and prototypes at onset.
- Cohesive team with trust, transparency, and openness.
- Shared visions of success and make assumptions explicit.
- Focus on decision making, strategic planning goals, and providing relevant data ---not just on providing access to more data.

Lessons Learned - Continued

- Best outcomes attained if iterative process with small-scale campus rollouts.
- Communicate the purposes effectively and accurately (manage expectations) - do not overpromise.
- Focus on some key deliverables yet understand that project necessitates continuous change and improvements.
- Identify metrics to judge effectiveness of project - develop an assessment plan for measuring success of the BI Initiative.
- Understand resources available and leverage available assets.
- Importance of Metadata and clear documentation.

Visions for the Future

- Series of visually appealing reports and dashboards to mark progress toward strategic planning goals
- Storytelling with Tableau example:
http://www.postsecondaryanalytics.com/edatta_in_tool/
- All campus rollout
- Develop a series of public reports and dashboards