State Reporting with Blackboard Analytics
Data Warehouse

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Agenda

• Introduction
• Versioning
• Selection
• Custom Fields
• Data Cleaning
• Output
• Questions
UMBC

University of Maryland - Baltimore County

- Located a few miles south of Baltimore, MD
- 9 Pan-Am chess championships
- #1 Up & Coming university (last 3 years)
- #4 in Undergrad Teaching

- PeopleSoft SA, Finance and HR
- Blackboard Analytics for data warehouse
- SQL Server 2008 R2
“Official” Reporting

• Who
  – Federal (IPEDS)
  – Maryland Higher Education Commission (MHEC)
  – University System of Maryland (USM)
  – Campus

• What
  – Applications
  – Enrollments
  – Credit Hours / FTE
  – Degrees
  – Employees
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- Introduction
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Versioning

- Blackboard Analytics (BbA) methodology
- DimVersion
- “10th Day” Freeze
- Summer/Winter Admits
- Change Freeze Key
- Special Version
- Degrees
- Employees
BbA Methodology

- Copy of “Current Snapshot”
- Administrative page
  - Select different Version
  - Future scheduling
## DimVersion

<table>
<thead>
<tr>
<th>Versionkey</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>Unknown</td>
</tr>
<tr>
<td>1</td>
<td><strong>Current Snapshot</strong></td>
</tr>
<tr>
<td>3</td>
<td>End of Term Census</td>
</tr>
<tr>
<td>4</td>
<td>Begin Term Census</td>
</tr>
<tr>
<td>7</td>
<td>Day -5</td>
</tr>
<tr>
<td>8</td>
<td>Day 1</td>
</tr>
<tr>
<td>9</td>
<td>Day 5</td>
</tr>
<tr>
<td>10</td>
<td>Day 25</td>
</tr>
<tr>
<td>11</td>
<td>POTENTIAL Begin Term Census</td>
</tr>
<tr>
<td>13</td>
<td>End of Year Degree Census</td>
</tr>
<tr>
<td>14</td>
<td>Begin Special Term Census</td>
</tr>
<tr>
<td>15</td>
<td>Advanced Registration</td>
</tr>
</tbody>
</table>
“10th Day” Freeze

• “Begin Term Census”
  – Delivered
  – Official Freeze at end of schedule adjustment
  – Fall and Spring only

• “Potential Begin Term Census”
  – New VersionKey
  – Update to “Begin Term Census”
  – Avoids version availability until valid
Summer / Winter Admits

- Summer Admits
  - Treated as Fall admits
  - Frozen in Summer and Fall
  - Need to know both
  - Winter treated as Spring

- New field: Reporting Admit Term

<table>
<thead>
<tr>
<th>Key</th>
<th>Admit Term</th>
<th>Key</th>
<th>Rptg Admit Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Summer 2011</td>
<td>101</td>
<td>Fall 2011</td>
</tr>
<tr>
<td>101</td>
<td>Fall 2011</td>
<td>101</td>
<td>Fall 2011</td>
</tr>
</tbody>
</table>
Change Freeze Key

RptgAdmitTermKey vs TermKey

• HEA.SnapshotFinal procedure
  – Modified INSERT and DELETE statements
  – Fields based on Term being processed
  – FactApplications only
Special Version

- Freeze at end of Summer schedule adjustment
  - VersionKey 4, AdmitTerm Summer 2011
- Fall freeze includes Summer
  - VersionKey 4, AdmitTerm Summer 2011

- “Begin Special Term Census”
  - New VersionKey
  - Avoids duplicate TermKey in Version
Degrees

“End of Year Degree Census”

- Freeze degrees in August 2012
  - Summer 2011, Fall 2011, Spring 2012
- Manual freeze
  - copy Version 1 to 13 (New VersionKey)
  - DimTerm.Academic Year = ‘2012’
- FactDegreeAwards
  - One record per degree
- FactDegreePlans (New table)
  - One record per major per degree
Employees

- Refreshed Every Night

Current

Freeze Appends

Frozen

Employees

Not part of BbA
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Selection of Official Records

New Dimensions

- Official Application
- Official Enrolled
- Official Subject
- Official Degree Plan
Official Application

- Exclude
  - Readmit/Reinstate
  - Continuing Education
  - Previously Enrolled at "Student Level"
  - Intercampus

- One Record Per Student
  - Enrolled with application
  - Program Status (admit over applied)
  - Education Level (PhD over Masters)
Official Enrolled

• **Include**
  – Enrolled
  – Official Plan
  – Primary StudentTerm (UG & Grad)

• **Exclude**
  – Continuing Education
  – Taking only Audit courses
  – Taking only “Place holder” courses
Official Subject

- Reporting Credit Hours and FTE
- Custom table of Subject attributes

- Excludes
  - “Place holder” courses
    - Study Abroad
    - Grad Assistant
    - Practicum
  - Intercampus
  - Remedial Subjects
Official Degree Plan

- New table: FactDegreePlans
- Include
  - Awarded
  - Valid HEGIS/CIP Code
  - Major/Certificate only
- Exclude
  - Previously Awarded
  - Secondary Plan for Graduate students
  - Duplicates
  - Mixed degree level
Agenda

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Custom Fields

- Gender
- IPEDS
- Ethnicity / Multiple Ethnicities
- FTE
- App Enrolled Official
- App Student Level
- Degree Sought MHEC
- Other Custom Fields
GenderIPEDS

- Handling “Unknown” Gender
- Based on Student ID
- Even = “Male – Assigned” …..

<table>
<thead>
<tr>
<th>SourceKey</th>
<th>Description</th>
<th>AltDescription</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>Male</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
<td>Female</td>
</tr>
<tr>
<td>3</td>
<td>Male</td>
<td>Male - Assigned</td>
</tr>
<tr>
<td>4</td>
<td>Female</td>
<td>Female - Assigned</td>
</tr>
</tbody>
</table>
Ethnicity

- DimEthnicity
  - DimStudent.CurrentEthnicity

- DimIPEDSEthnicity
  - DimStudent.CurrentEthnicity
  - DimStudent.CurrentCitizenship
  - Added EthnicityCodeIPEDS
  - Added EthnicURMCount
Multiple Ethnicities

Single Answer

- Helper table created
  - Single ethnicity per person
  - Source for CurrentEthnicity
- Any Hispanic = Hispanic
- More than one non-Hispanic = “Two or More”
- “MULTI” ethnicity created in load
Multiple Ethnicities

Multiple Answers

• DimEthnicities
  – New static dimension (128 combos)
  – Allows for multiple ethnicities
  – Indicator for each ethnicity

• SourceKey
  AMIND-ASIAN-BLACK-HISPA-NSPEC-PACIF-WHITE
  -ASIAN-BLACK-HISPA---
  ------WHITE
FTE

• Delivered
  – FactStudentTerm
  – 'FTE Divisor - Undergraduate‘ (12)
  – 'FTE Divisor - Non-Undergraduate‘ (9)

• Customization
  – FactRegistration
  – Course Level (ug 15)
  – Thesis course (9)
  – Masters/Doctoral student (12/10)
App Enrolled Official

Is student officially enrolled in Fall/Spring with this Application?

- Trying to sync Applicant file indicating enrolled with the Enrollment file indicating new
- Case: UG applies for Grad, stays UG
- New field in FactApplications, but set in PreLoad FactStudentTerm
- Must be Officially Enrolled in Rptg Admit Term
- Admissions Application Number must match
App Student Level

- **Student Level**
  - Undergrad
  - Masters
  - Doctorate

- **Student Level New**
  - Previous Enrollment at Student Level

- **Student Level Status**
  - Report to State combination of two variables
Degree Sought MHEC

- State codes for degree objective
- Attribute associated with each Plan
- Dimension attributes
  - Current MHEC code
  - Code for Enrollment file Prior to 2009
  - Code for Degree file Prior to 2009

- Separate code for “Bachelors 2\textsuperscript{nd} Major”
Other Custom Fields

• New Status Official
  – New/Continuing, Freshmen/Transfer
• First Time Status MHEC
• Geographic Origin Official
  – Time of application
  – County, State, International
• DimResidency.Residency MHEC
• Instruction Mode
• Room Scheduled By
Campus Reporting

Plan = “BIOL BS”

- Plan Objective
  - Bachelors
- Reporting Plan
  - “BIOL”
  - UG/Grad Indicators
- Plan Reporting Org
  - BIOL and MOCB to “Biological Sciences”
- Plan Reporting College
Plan Attributes

- Custom setup table
- Reporting Organization rollup
- Degree Sought MHEC
- Online Plan indicator
- Second Campus indicator
- Continuing Ed indicator
- STEM indicator
Slowly Changing Dimension

Plan Attributes History

• Reporting Org rollup changes over time
• Setup table has Begin and End Term
• DimPlanAttributes
  – Latest record for each Plan
  – Lookup by SourceKey
• DimPlanAttributesHistory
  – All records
  – Lookup by SourceKey AND Term between Begin and End Term
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Data Cleaning

- Clean it in the transaction system
  - Daily reports for Data Quality
- “Unknown” values (key = -1)
- Create fake records
  - Bad majors
  - “Two or More” Ethnicity
- New fields
  - GenderIPEDS
  - App Enrolled Official
Output

• Extract files to State
  – SAS
  – Selection using proper Version
  – Selection using “Official” fields

• Campus reports
  – Any reporting tool
  – Same selection criteria
  – Same fields
Recap

• Versioning
  – New Versions
  – Change selection key
  – Manual freezes

• Selection
  – “Official” indicators

• Custom Fields
  – PeopleSoft shortcomings
  – “State” requirements

• Current and Frozen data together
Wrap Up

Any Questions?

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Source code is available upon request