Deconstructing the Tortoise and the Hare: Building a Student Tracking Application

Christina Drum
Office of Institutional Analysis & Planning
University of Nevada, Las Vegas

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October 18, 2007
Overview

• Our Starting Point
• Clarifying Project Goals
• Application Design
• StudentTracker Demonstration
• Technical Development
• Testing and Implementation
• Challenges Encountered
• Impact Thus Far
• Questions
I just got our consultant's report. He's identified our biggest problem.

I recommend that we build a tracking database. We can put it on the network.

Would you like to hear what the problem is first?

I hate to dwell on the negative. We like databases.
Our Starting Point

• Data Warehouse
• DataNet Application
  – Aggregated Trend and Detailed Listing Reports
  – Data Dictionary & Online Help
  – Discussion Forums
  – Access Approval Process
  – Mandatory Training
  – Security Mechanism
  – 86 Users (at the time)
  – ASP.NET v.1.0
Clarifying Project Goals

• What did we want to automate?
• What information should the application deliver?
• Easy-to-use web interface
  – Relation to DataNet?
• Flexibility in defining cohorts
• Facilitate use of standard definitions and measures
• Allow for analyses beyond these standards
Initial Design “Mock-up”

• Driven by two questions
  – How will users define cohorts?
  – What reporting options will we offer?

• Wizard interface
  1. Identify the cohort you would like to track.
  2. Verify your cohort.
  3. Choose options for report output.
Initial Design “Mock-up”

- Sample Aggregate Report

<table>
<thead>
<tr>
<th></th>
<th>Enrolled</th>
<th>Graduated</th>
<th>Discontinued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2001 (cohort)</td>
<td>307</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fall 2002</td>
<td>215</td>
<td>-</td>
<td>92</td>
</tr>
<tr>
<td>Fall 2003</td>
<td>166</td>
<td>-</td>
<td>141</td>
</tr>
<tr>
<td>Fall 2004</td>
<td>118</td>
<td>29</td>
<td>160</td>
</tr>
</tbody>
</table>

- Sample Detailed Listing

<table>
<thead>
<tr>
<th></th>
<th>Fall 2001</th>
<th>Fall 2002</th>
<th>Fall 2003</th>
<th>Fall 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student1</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Student2</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Focus Groups

- Invited active DataNet users & other key stakeholders
- Two sessions with ~10 participants each
- Refreshments
- Provided copies of mock-up to jumpstart discussion around informational needs
- Used a set of questions to structure the conversation
- Very useful in helping us refine our thinking
Focus Groups

• What we heard/learned
  – Some needed trend reports, while others needed to track specific students.
  – Lots of barriers to obtaining student tracking information.
  – Considerable need for this information multiple contexts.
  – The importance of flexibility in cohort definition was even greater than we anticipated.
  – We would not be able to address everything.
  – “I would weep at my desk if it just appeared to me this way.”
“Finalizing” Design

- Returned to and revised original mock-up
- Revisited focus group notes
- Settled on 4 report types
  - One-year, fall-to-fall retention analysis
  - Six-year graduation rate analysis
  - Term-by-term aggregate report
  - Term-by-term student listing report
- Added much greater flexibility to cohort definition options
“Finalizing” Design

• Revised structure of wizard
  1. Choose type of report.
  2. Identify basic cohort.
  3. Further define cohort.
  5. Select report preferences.

• “Stand-alone” application, integrated with DataNet through shared components and common user interface.
Demonstration
Technical Development

• Decided on an overall architecture
• ASP.NET v.2.0, SQL Server 2000
• Performance testing on the back-end
• Started with coding the fall-to-fall retention report (simplest)
• Other reports followed; each presented unique technical challenges
Technical Development

- Saving cohorts and reports
- Downloading to Excel
- Formatting and design
- Logging and error handling
- Multiple learning curves
- Major coding took about nine months
Meanwhile, back at the ranch...

- Authentication system
- DataNet 2.0
DataNet Integration

• Common interface design
  – Navigation
  – Selection criteria "controls"
  – Look and feel

• Integrated online help system

• Same data dictionary

• Shared discussion forums

• "Sister applications"
Launching StudentTracker

- Asked DataNet users to volunteer as beta-testers this past summer
- Training
  - On using the application
  - On cohort survival analysis
  - Training manual
- Launched to all DataNet users earlier this month
- More special training sessions
Challenges Encountered

- Settling on the design
- Fixed major limitation during test phase
- Did not get to everything
  - Annual cohorts
  - Defining cohorts by uploading student IDs
- Complex undertaking
  - Big projects can become manageable with:
    - Good support (training, time, patience)
    - Breaking things down into manageable pieces
    - Persistence
Assessing Impact Thus Far

• Our office
  – Improved understanding of tracking students across multiple terms
  – Helping with our reports and analyses

• Beta-testers
  – Associate Dean of Graduate College
  – Provost’s Planning Initiative
  – Academic Advisors
What’s Next

- Presentations to Campus Groups
- Additional Functionality
  - Uploading Student IDs
  - Additional reports
  - Integrating end-of-semester data?
- Server Migration
- Moving On
- Assessing Impact
Questions?

• For further information…
  – Our website: http://ir.unlv.edu
  – Email: christina.drum@unlv.edu

• Thank you!
studenttracker

screenshots

October 2007
Persistence and Graduation Reports

Welcome to StudentTracker, where you identify a cohort of students who were enrolled at UNLV during a given term, and then track their enrollment and graduation in subsequent terms.

This wizard will guide you through the following steps:

1. Choose the type of report you would like to run.
2. Identify the basic cohort you would like to track.
3. Further define your cohort.
4. Verify the cohort you have selected.
5. Select preferences for report output.

Get Started >>
One-year, Fall-to-fall Retention Analysis

The one-year, fall-to-fall retention analysis, as its name implies, automates reports that present a cohort’s one-year retention. An example of this type of report is shown below. This example shows first-year retention by ethnicity of a fall 2005 cohort of new freshmen. The first column of figures shows the number of students in the cohort. The second and third columns of figures show the number and percent of the cohort who were enrolled in the following fall.

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Fall 2005 Cohort (%)</th>
<th>Retained in Fall 2006 (♯)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>273</td>
<td>181</td>
<td>66.3%</td>
</tr>
<tr>
<td>Asian</td>
<td>538</td>
<td>405</td>
<td>75.3%</td>
</tr>
<tr>
<td>Caucasian</td>
<td>1,141</td>
<td>776</td>
<td>68.0%</td>
</tr>
<tr>
<td>Foreign National</td>
<td>40</td>
<td>37</td>
<td>92.5%</td>
</tr>
</tbody>
</table>
Cohort Survival Analysis

In the context of measuring student retention and graduation, cohort survival analyses involve identifying a cohort, or group, of students who enrolled during a given term, and then tracking this group longitudinally across subsequent terms. Sometimes the analysis only considers one subsequent term, as in the case of measuring one-year retention rates. Other analyses look at multiple points in time after the initial cohort term.

Much of cohort survival analysis revolves around defining the cohort to study. For a number of standard reports—e.g., IPEDS and the Common Data Set—a standard cohort definition of first-time, full-time baccalaureate-degree seeking freshmen is used. Sometimes a researcher is interested in examining a particular student characteristic (e.g., academic preparation, ethnicity) or course-taking behavior (e.g., students who took an English course during their first term). In these cases, it is common practice to begin with a standard cohort definition and then break down the results of the study by the other measure(s) of interest. The following report, for example, shows retention rates of a fall 2005 cohort of first-time, full-time freshmen by ethnicity.

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Fall 2005 Cohort</th>
<th>Retained in Fall 2006</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>273</td>
<td>181</td>
<td>66.3%</td>
</tr>
</tbody>
</table>
Report Selection

1. Choose the **type of report** you would like to run.

   - One-year, fall-to-fall retention analysis
   - Six-year graduation rate analysis
   - Term-by-term aggregate report
   - Term-by-term student listing report

[<< Return to Overview](#)  [Identify Cohort >>](#)
Basic Cohort Selection

2. Identify the basic cohort you would like to track. You may choose from the options below, or load a saved cohort.

**Cohort Term:** Fall 2000

**Cohort Level:** Undergraduate

**Basic Cohort:**
- All Undergraduates
- First-time Freshmen
- New Undergraduate Transfers
- All Admitted Undergraduates
- Non-admitted Undergraduates

Include baccalaureate degree-seeking students only.
Further Cohort Definition

3. You may further define your cohort by selecting from the options below.

Student Characteristics

- Enrollment Status: Full-time
- Residence: All Students
- College of Major: All Colleges
- Department: All Departments
- Major: All Majors

Additional Student Criteria:
- Match all conditions in this group
- High School Region Code is NVCL
- Add

Course Enrollments (in Cohort Term)

Include Students Enrolled in:
- Match all conditions in this group
- Course Prefix is ENG
- Add
4. Review and confirm your cohort selections.

You have chosen to run a six-year graduation rate analysis for a Fall 2000 cohort of 916 first-time freshmen.

**Student Characteristics**

- You have filtered this cohort to include:
  - Baccalaureate degree-seeking students only
  - Full-time students only
  - Nevada residents and non-residents
  - Students majoring in:
    - College: All Colleges
    - Department: All Departments
    - Major: All Majors

Records matching the following condition:

- High School Region Code Is NVCL

**Course Enrollment Criteria**

- **Cohort includes:**
  - Records matching the following condition:
    - Course Prefix Is ENG

**Save Cohort for Future Use**

You may now modify this cohort by returning to the previous screen(s), or proceed and set your report preferences.
Report Preferences

5. You may select up to three group-by options below.

Group By:

- High School GPA
- Student College
- Student Department
- Major
- Program
- Gender
- Ethnicity
- Residence

- [ ] Include Totals
- [ ] Include Certificates in Graduation Results

<< Return to Cohort Verification  Display Report >>
### Six-year Graduation Rate Report: Fall 2000 through August 2006

<table>
<thead>
<tr>
<th>High School GPA</th>
<th>Fall 2000 Cohort (#)</th>
<th>Graduated by August 2006 (#)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.25 - 2.49</td>
<td>2</td>
<td>1</td>
<td>50.0%</td>
</tr>
<tr>
<td>2.50 - 2.74</td>
<td>74</td>
<td>12</td>
<td>16.2%</td>
</tr>
<tr>
<td>2.75 - 2.99</td>
<td>133</td>
<td>31</td>
<td>23.3%</td>
</tr>
<tr>
<td>3.00 - 3.24</td>
<td>242</td>
<td>71</td>
<td>29.3%</td>
</tr>
<tr>
<td>3.25 - 3.49</td>
<td>201</td>
<td>87</td>
<td>43.3%</td>
</tr>
<tr>
<td>3.50 - 3.74</td>
<td>168</td>
<td>88</td>
<td>52.4%</td>
</tr>
<tr>
<td>3.75 and above</td>
<td>91</td>
<td>55</td>
<td>60.4%</td>
</tr>
<tr>
<td>No HS GPA</td>
<td>5</td>
<td>2</td>
<td>40.0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>916</strong></td>
<td><strong>347</strong></td>
<td><strong>37.9%</strong></td>
</tr>
</tbody>
</table>

Notes: 1) Small cohort counts may limit generalizability of results.
2) If the cohort is limited to one student level (e.g., undergraduate, graduate), then only degrees conferred at that level are included in the graduation results.
3) Certificates are included in graduation results.

Source: Student Information System, UNLV StudentTracker
Report Date: 10/15/2007

### Cohort Definition
This Fall 2000 cohort of 916 first-time freshmen includes:
- Baccalaureate degree-seeking students only
- Full-time students only
- Nevada residents and non-residents
- Students majoring in:
  - College: All Colleges
  - Department: All Departments
## Fall 2005 to Fall 2006 Retention Report

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>Fall 2005 Cohort (#)</th>
<th>Retained in Fall 2006 (#)</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>272</td>
<td>181</td>
<td>66.5</td>
</tr>
<tr>
<td>Asian</td>
<td>533</td>
<td>402</td>
<td>75.4</td>
</tr>
<tr>
<td>Caucasian</td>
<td>1,134</td>
<td>772</td>
<td>68.1</td>
</tr>
<tr>
<td>Foreign National</td>
<td>40</td>
<td>37</td>
<td>92.5</td>
</tr>
<tr>
<td>Latino</td>
<td>415</td>
<td>263</td>
<td>68.2</td>
</tr>
<tr>
<td>Native American</td>
<td>41</td>
<td>29</td>
<td>70.7</td>
</tr>
<tr>
<td>Not Disclosed</td>
<td>123</td>
<td>81</td>
<td>65.9</td>
</tr>
<tr>
<td>Unknown</td>
<td>388</td>
<td>291</td>
<td>75.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>2,946</strong></td>
<td><strong>2,076</strong></td>
<td><strong>70.5%</strong></td>
</tr>
</tbody>
</table>

Note: Small cohort counts may limit generalizability of results.
Source: Student Information System, UNLV StudentTracker
Report Preferences

5. Please indicate your report preferences below.

Track Cohort through: Fall 2006

Display Intervening Terms:

- Fall
- Spring
- Summer

- Include Certificates in Graduation Results

<< Return to Cohort Verification  Display Report >>

Start Over
Retention and Graduation Rates of Fall 1998 Cohort through Fall 2006

<table>
<thead>
<tr>
<th></th>
<th>Still Enrolled (not graduated)</th>
<th>Graduated Undergraduate Level</th>
<th>Graduated Graduate Level</th>
<th>Not Enrolled (not graduated)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
</tr>
<tr>
<td>Fall 1998</td>
<td>20861</td>
<td>100.0 %</td>
<td>0</td>
<td>0.0 %</td>
</tr>
<tr>
<td>Fall 1999</td>
<td>11951</td>
<td>57.3 %</td>
<td>2250</td>
<td>10.8 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>565</td>
<td>2.7 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6095</td>
</tr>
<tr>
<td>Fall 2000</td>
<td>7524</td>
<td>36.1 %</td>
<td>4546</td>
<td>21.8 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1211</td>
<td>5.8 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7580</td>
</tr>
<tr>
<td>Fall 2001</td>
<td>4846</td>
<td>23.2 %</td>
<td>6444</td>
<td>30.9 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1667</td>
<td>8.0 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7904</td>
</tr>
<tr>
<td>Fall 2002</td>
<td>3060</td>
<td>14.7 %</td>
<td>7847</td>
<td>37.6 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1905</td>
<td>9.1 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8049</td>
</tr>
<tr>
<td>Fall 2003</td>
<td>1786</td>
<td>8.6 %</td>
<td>8859</td>
<td>42.5 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2041</td>
<td>9.8 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8175</td>
</tr>
<tr>
<td>Fall 2004</td>
<td>1121</td>
<td>5.4 %</td>
<td>9365</td>
<td>44.9 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2135</td>
<td>10.2 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8240</td>
</tr>
<tr>
<td>Fall 2005</td>
<td>763</td>
<td>3.7 %</td>
<td>9632</td>
<td>46.2 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2186</td>
<td>10.5 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8280</td>
</tr>
<tr>
<td>Fall 2006</td>
<td>526</td>
<td>2.5 %</td>
<td>9832</td>
<td>47.1 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2228</td>
<td>10.7 %</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8275</td>
</tr>
</tbody>
</table>

Notes: 1) Small cohort counts may limit generalizability of results.
2) If a student has earned multiple degrees during the time frame indicated, only the earliest degree is reflected in the results.
3) Certificates are included in graduation results.
Source: Student Information System, UNLV Student Tracker
Report Date: 10/15/2007
Report Preferences

5. Please indicate your report preferences below.

Track Cohort through: [Fall 2006]

Display Intervening Terms:
- Fall
- Spring
- Summer

Display Term-by-term Enrollment by: [Standing]

- Include Student Names
- Include Graduation Data

Include Student Characteristics (from cohort term):
- Origin
- Student College
- Student Department
- Major
- Program
- Gender
- Ethnicity
- Age

<< Return to Cohort Verification  Display Report >>

Retrieving report...
### Fall 2003 Student Listing: Persistence and Graduation through Fall 2006

<table>
<thead>
<tr>
<th>PersonID</th>
<th>Origin</th>
<th>Fall 2003</th>
<th>Persistence by Standing</th>
<th>Degrees Conferred</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fall 2004</td>
<td>Fall 2005</td>
</tr>
<tr>
<td>L000073310</td>
<td>AZ</td>
<td>U04</td>
<td>U04</td>
<td></td>
</tr>
<tr>
<td>L000119233</td>
<td>AZ</td>
<td>U04</td>
<td>U04</td>
<td></td>
</tr>
<tr>
<td>L000501198</td>
<td>NM</td>
<td>U04</td>
<td>U04</td>
<td></td>
</tr>
<tr>
<td>L000502734</td>
<td>HI</td>
<td>U03</td>
<td>U04</td>
<td>U04</td>
</tr>
<tr>
<td>L000503037</td>
<td>OR</td>
<td>U01</td>
<td>U02</td>
<td>U03</td>
</tr>
<tr>
<td>L000503627</td>
<td>CO</td>
<td>U03</td>
<td>U04</td>
<td></td>
</tr>
<tr>
<td>L000506478</td>
<td>NM</td>
<td>U02</td>
<td>U03</td>
<td>U03</td>
</tr>
<tr>
<td>L000508848</td>
<td>CO</td>
<td>U02</td>
<td>U02</td>
<td>U02</td>
</tr>
<tr>
<td>L000509763</td>
<td>AZ</td>
<td>U01</td>
<td>U02</td>
<td>U02</td>
</tr>
<tr>
<td>L000510102</td>
<td>CO</td>
<td>U01</td>
<td>U02</td>
<td>U02</td>
</tr>
<tr>
<td>L000510174</td>
<td>HI</td>
<td>U01</td>
<td>U02</td>
<td>U02</td>
</tr>
<tr>
<td>L000510272</td>
<td>WA</td>
<td>U02</td>
<td>U02</td>
<td>U02</td>
</tr>
<tr>
<td>L000512753</td>
<td>HI</td>
<td>U01</td>
<td>U02</td>
<td>U02</td>
</tr>
</tbody>
</table>
Frequently Asked Questions

Select a category:

- About DataNet and StudentTracker
- About the Data
- Running DataNet Reports
- Running StudentTracker Reports
- Data Documentation
- Preferences
- Community Resources
- Training
- Preliminary and Final Reports
<table>
<thead>
<tr>
<th>Element</th>
<th>Data Source</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>AcademicYear</td>
<td>ALLGRADS</td>
<td>IAP Data Warehouse</td>
</tr>
<tr>
<td>ACTC</td>
<td>STUDENTS</td>
<td>IAP Data Warehouse</td>
</tr>
<tr>
<td>ACTE</td>
<td>STUDENTS</td>
<td>IAP Data Warehouse</td>
</tr>
<tr>
<td>ACTM</td>
<td>STUDENTS</td>
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</tr>
<tr>
<td>ADMITCODE</td>
<td>STUDENTS</td>
<td>IAP Data Warehouse</td>
</tr>
<tr>
<td>ADMITYEAR</td>
<td>STUDENTS</td>
<td>IAP Data Warehouse</td>
</tr>
<tr>
<td>AGE</td>
<td>STUDENTS</td>
<td>IAP Data Warehouse</td>
</tr>
<tr>
<td>ApprovalYear</td>
<td>PMD</td>
<td>IAP Data Warehouse</td>
</tr>
<tr>
<td>APRGDPTCD</td>
<td>APRG</td>
<td>Student Information System</td>
</tr>
<tr>
<td>APRGGRDDT</td>
<td>APRG</td>
<td>Student Information System</td>
</tr>
<tr>
<td>APRGPGCD</td>
<td>APRG</td>
<td>Student Information System</td>
</tr>
<tr>
<td>APRGPID</td>
<td>APRG</td>
<td>Student Information System</td>
</tr>
<tr>
<td>APRGSCHCD</td>
<td>APRG</td>
<td>Student Information System</td>
</tr>
</tbody>
</table>
### DataNet / StudentTracker

<table>
<thead>
<tr>
<th>Announcements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Announcements from the Office of Institutional Analysis and Planning that would impact the DataNet and StudentTracker applications are posted here</td>
</tr>
<tr>
<td>Topics</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>35</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Open Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>This is an open forum for all DataNet and StudentTracker users to discuss data issues and ask questions.</td>
</tr>
<tr>
<td>Topics</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>55</td>
</tr>
</tbody>
</table>

### Training and Testing

<table>
<thead>
<tr>
<th>Training Forum</th>
</tr>
</thead>
<tbody>
<tr>
<td>For practicing community functions during training sessions</td>
</tr>
<tr>
<td>Topics</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>31</td>
</tr>
</tbody>
</table>