

## Student Development and Enrollment Services Dashboard at UCF

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### ABSTRACT

At the University of Central Florida (UCF), Student Development and Enrollment Services (SDES) combined efforts with Institutional Knowledge Management (IKM), which is the official source of data at UCF, to venture in a partnership to bring to life an electronic version of the SDES Dashboard at UCF. Previously, SDES invested over two months in a manual process to create a booklet with graphs and data that was not vetted by IKM; upon review, IKM detected many data errors plus inconsistencies in the figures that had been manually collected by multiple staff members over the years. The objective was to redesign this booklet using SAS® Web Report Studio. The result was a collection of five major reports. IKM reports use SAS® Business Intelligence (BI) tools to surface the official UCF data, which is provided to the State of Florida. Now it just takes less than an hour to refresh these reports for the next academic year cycle. Challenges in the design, implementation, usage, and performance are presented.

### INTRODUCTION

SDES provided IKM with a booklet containing a set of reports that were manually generated. SDES spent an enormous amount of time creating this booklet twice a year based on preliminary and final data sets. SDES had no control of the data being displayed because it originated from different sources on each iteration of the report (it depended on the person compiling the report), and it was created manually using Microsoft Word and Microsoft Excel.

A redesigned report using SAS Web Report Studio software was implemented by creating a set of five main reports. Each report contains between three and nine tabs (sections), depending on the content. Two of the five main reports use report-linking capabilities (six additional reports are behind those two front-end reports). This development allowed room to include variations of the original data; for example, multiple cohorts and multiple ethnic groups. A total of 67 sections comprise the finalized project.

Each section is being fed by an information map created with SAS® Information Map Studio. The data supporting each report is official UCF data. Although the development took three months, cyclical updates require less than one hour of maintenance on the information maps and a lookup table being used as a filter for the retention, graduation, and progression reports. The actual reports are designed to be maintenance-free.

Reports are formatted to fit on one screen (to avoid scrolling), be opened on demand by using any computer or tablet (due to an increasing demand to use portable technology to share sensitive data in a timely manner) and are easily exportable to PDF. In addition, a set of three PDFs are being provided semi-annually. These PDFs include highlights of 12 different sections in preliminary and final versions, and also a final catalog with the entire content (approximately 100 pages). All PDFs provided have bookmarks for easy navigation. Two days are needed to create these documents.

### INSTITUTIONAL KNOWLEDGE MANAGEMENT

UCF's reporting needs are as varied as those of any other academic organization. At UCF, IKM is the official source of UCF institutional data and is tasked with providing accurate, insightful, and actionable information to the university and to the public. The primary resource to facilitate all of UCF's reporting needs is the implementation of our SAS 9.4 BI environment.

### PEGASUS MINE PORTAL

The user community at UCF, which consists of full-time faculty and staff, can access the university data warehouse through the SAS® Information Delivery Portal. This is also referred to as the Pegasus Mine Portal (PMP), a password-protected environment, which offers the ability to run pre-built dynamic reports that provide trend data for use in operational decision-making, strategic planning, forecasting, and performance measurement.

Our operational data store currently comprises over 18 years (more than 33 million rows) of student data based on official census files used for state reporting. This data store also contains additional source data (live, operational or siloed) from other university areas that are used to support custom reporting and information requirements.

The primary transaction data store from the university student enterprise system is an Oracle 12c Database environment. Additional data resources for snapshot information come from a Microsoft SQL server environment running a COGNOS RDS overlay.

## STUDENT DEVELOPMENT AND ENROLLMENT SERVICES

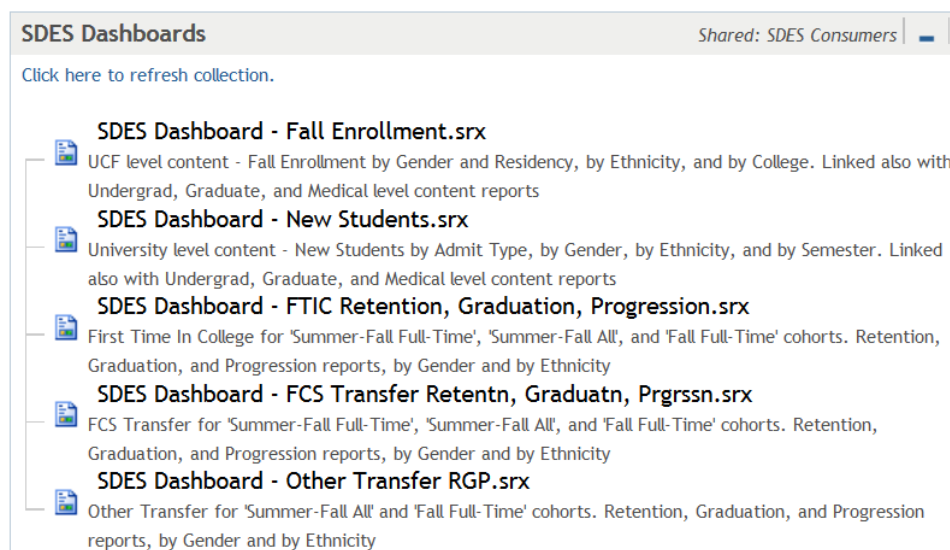
SDES is a division of the university, which is comprised of a wide-ranging array of programs and services, dedicated to providing students with opportunities for learning and a broad collegiate experience. SDES engages UCF students from matriculation to successful progression, graduation, and employment in a global workforce.

SDES activities, programs, and services provide further meaning to the UCF experience and increase UCF's competitive advantage. It is only through sustaining partnerships on campus and in the Central Florida city-state that SDES is able to empower students to succeed.

## SDES DASHBOARDS

### PEGASUS MINE PORTAL PORTLET

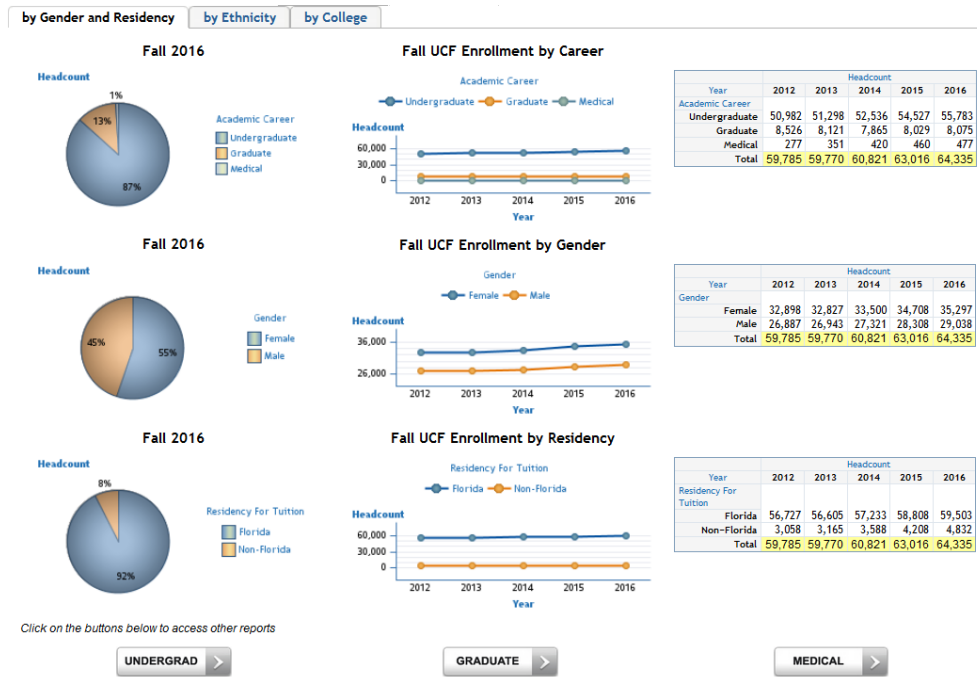
SDES Consumers (a security group) can access the reports in the SDES page of the PMP and SDES Dashboards portlet (see screen capture, Display 1 below).



Display 1. SDES Dashboards portlet

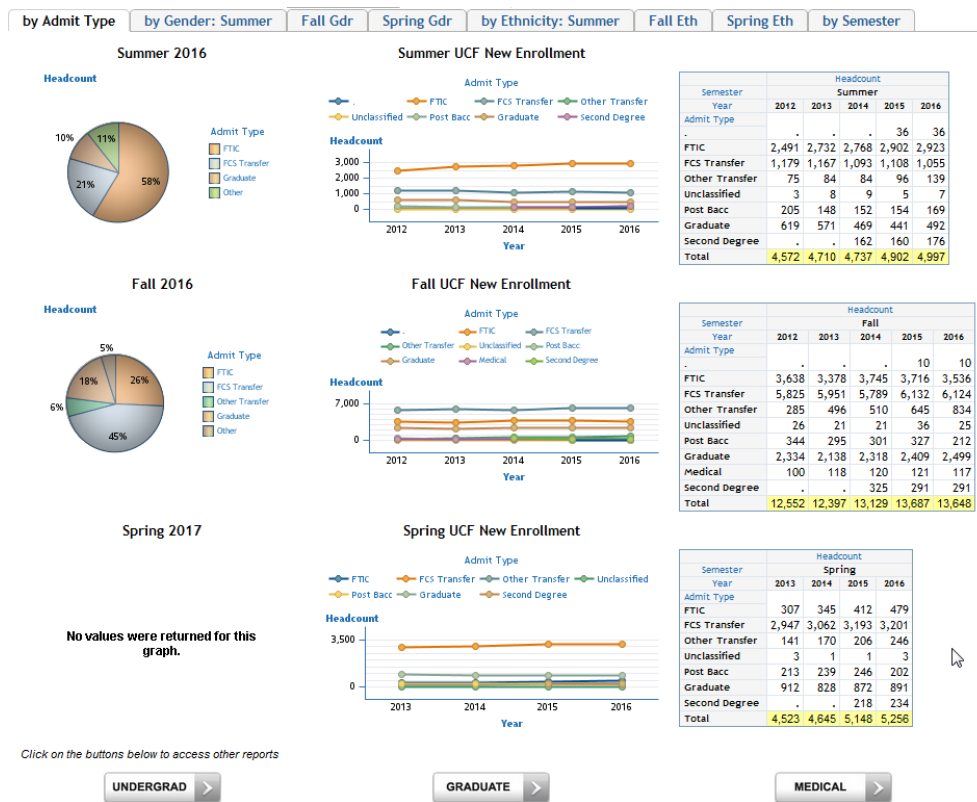
### FALL ENROLLMENT AND NEW STUDENTS

The series of reports for Fall Enrollment (see screen capture, Display 2 below) and New Students (see screen capture, Display 3 below), each include four reports: UCF, Undergraduate, Graduate, and Medical. These reports show percentages for specific metrics for the fall, the current academic year, and five-year trends. Report-linking is used in these series of reports to give user access to all different career options or to go back to the main UCF overall report. Please note that at the time this paper is published, Spring 2017 final values are not available, and this is indicated in the message being displayed in screen capture, Display 3 below.



Source: Student Instruction File (SIF)

## Display 2. Fall Enrollment, Fall UCF Enrollment by Gender and Residency

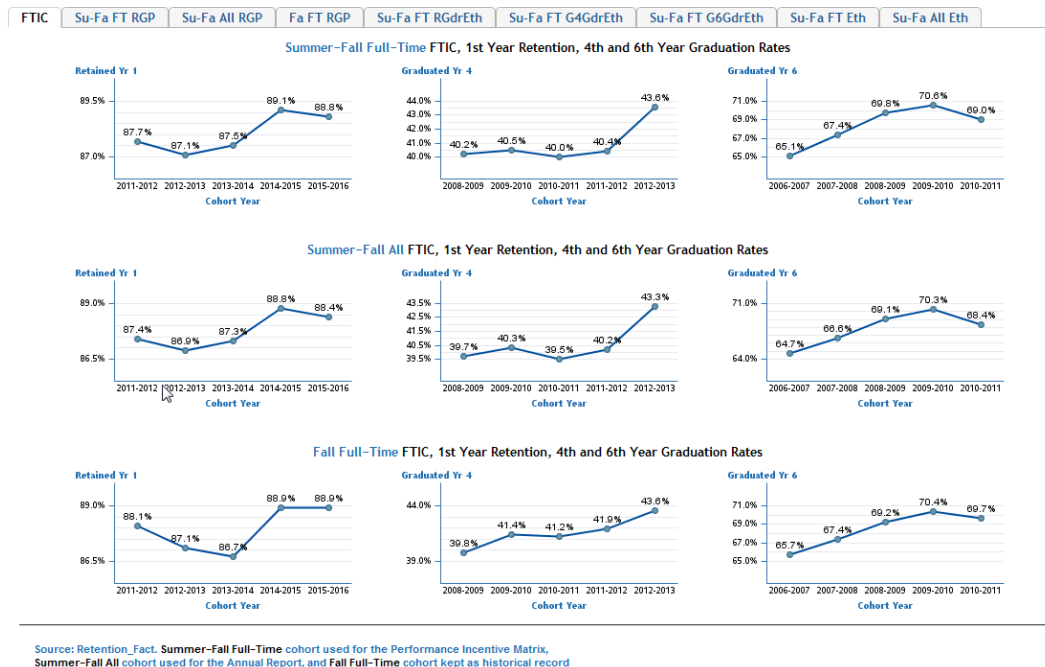


Source: Admissions File

## Display 3. New Students, UCF New Enrollment by Admit Type

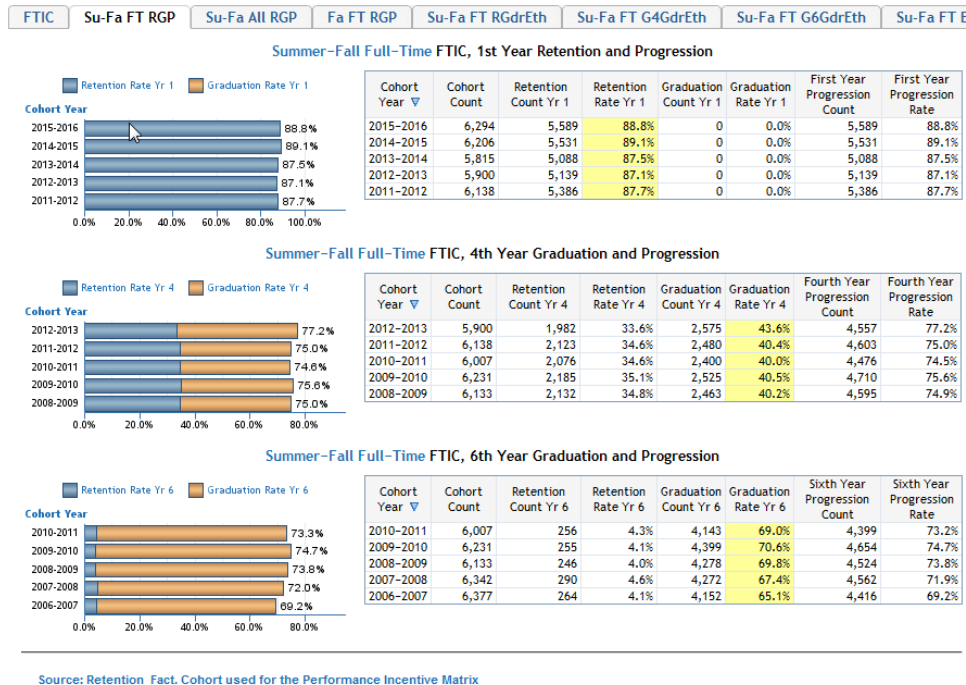
## FTIC RETENTION, GRADUATION, PROGRESSION

The following screen capture, Display 4, shows FTIC retention and graduation trends for three different cohorts across five academic years.



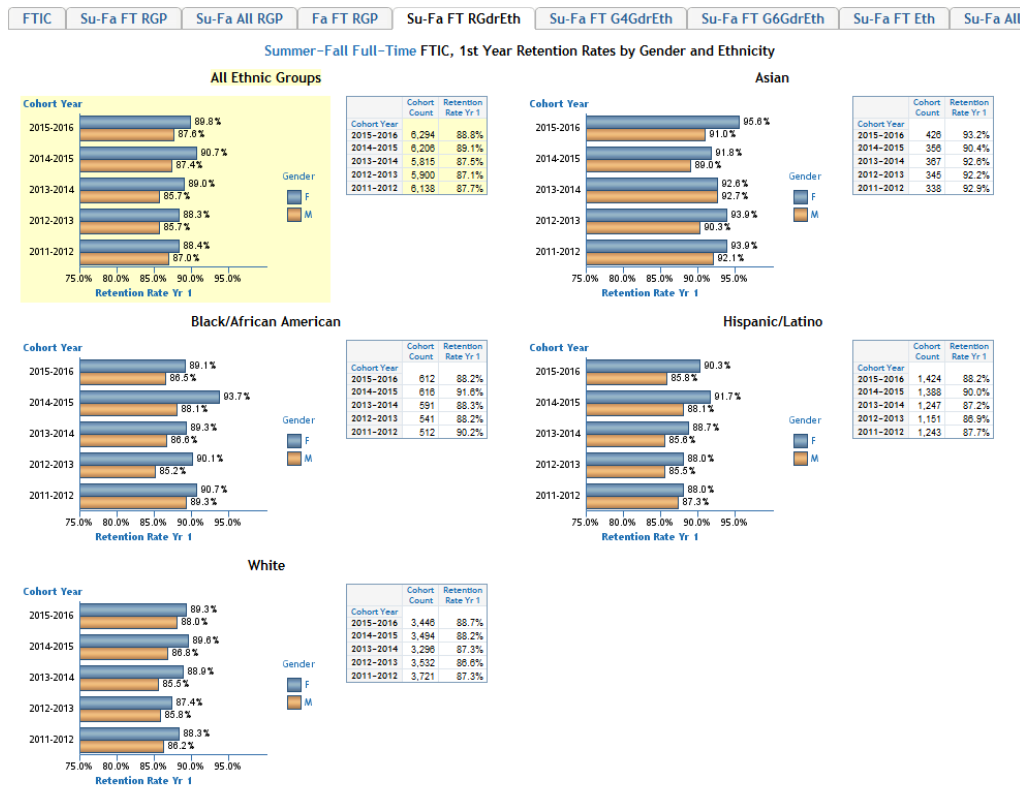
Display 4. FTIC Retention and Graduation Rates

Screen capture, Display 5 below, shows retention, graduation and progression rates for the last five academic years.



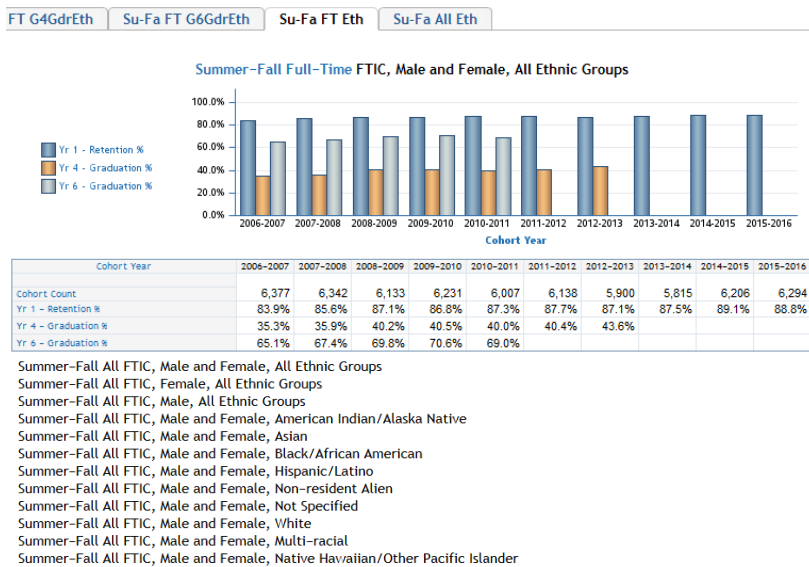
Display 5. Summer-Fall Full-Time FTIC Retention, Graduation, and Progression Rates

Ethnic groups of interest and their retention rates by gender can also be found in this report (see screen capture, Display 6 below).



## Display 6. Summer-Fall Full-Time FTIC Retention Rates by Gender and Ethnicity

Screen capture, Display 7 below shows a bar chart and a table with trends for the last ten academic years.

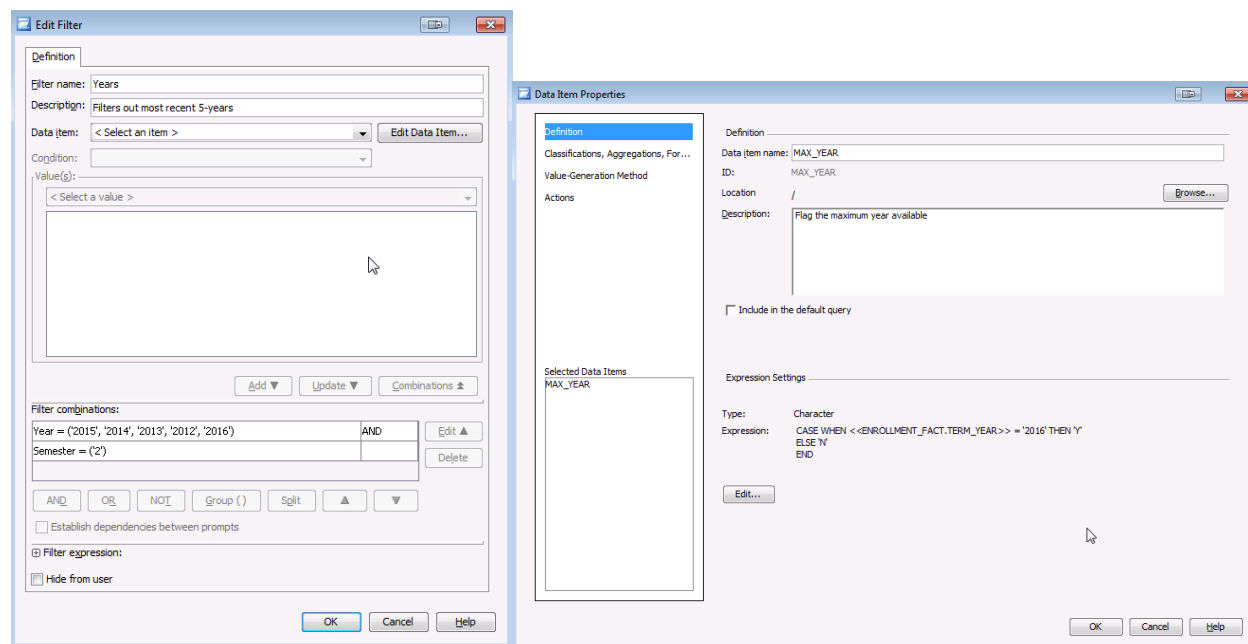


## Display 7. Su-Fa FT FTIC Retention and Graduation Rates by Gender and Ethnicity and list of variants

## MAINTENANCE

Maintenance of less than an hour is needed once a year to roll forward an academic year. Due to the high number of reports (11 total) and sections (67 total), the reports were designed as maintenance-free in order to avoid a scenario of dealing with a manually-intensive process.

Three information maps, 'Enrollment Fact Table', 'New Student Enrollment', and 'Retention', are used for this project, and a few of their calculated fields, such as 'Years' (a predefined filter) and 'MAX\_YEAR' (a calculated field), found on the 'Enrollment Fact Table' map, need to be updated (see screen capture, Display 8 below). Accordingly, a few calculated fields in the other maps also need to be updated.



**Display 8. Sample of a filter and a calculated field to be updated in one of the information maps**

On the other hand, for the Retention, Graduation, Progression reports, a lookup table (see screen capture, Display 9 below) needs to be updated by rolling forward one academic year in all the variables. Each variable will be used as a filter in the corresponding object (chart or table).

|    | CohortYear | RetainYr1 | RetainYr2 | GradYr4 | GradYr5 | GradYr6 | GenEth | RetainAvgYr1 | RetainAvgYr2 | GradAvgYr4 | GradAvgYr6 |
|----|------------|-----------|-----------|---------|---------|---------|--------|--------------|--------------|------------|------------|
| 1  | 2005-2006  |           |           |         |         |         |        |              |              |            |            |
| 2  | 2006-2007  |           |           |         |         | Y       | Y      | Y            | Y            | Y          | Y          |
| 3  | 2007-2008  |           |           | Y       | Y       | Y       | Y      | Y            | Y            | Y          | Y          |
| 4  | 2008-2009  |           | Y         | Y       | Y       | Y       | Y      | Y            | Y            | Y          | Y          |
| 5  | 2009-2010  |           | Y         | Y       | Y       | Y       | Y      | Y            | Y            | Y          | Y          |
| 6  | 2010-2011  | Y         | Y         | Y       | Y       | Y       | Y      | Y            | Y            | Y          | Y          |
| 7  | 2011-2012  | Y         | Y         | Y       | Y       |         | Y      | Y            | Y            | Y          | Y          |
| 8  | 2012-2013  | Y         | Y         | Y       |         |         | Y      | Y            | Y            | Y          |            |
| 9  | 2013-2014  | Y         | Y         |         |         |         | Y      | Y            | Y            | Y          |            |
| 10 | 2014-2015  | Y         | Y         |         |         |         | Y      | Y            | Y            |            |            |
| 11 | 2015-2016  | Y         |           |         |         |         | Y      | Y            |              |            |            |
| 12 | 2016-2017  |           |           |         |         |         |        |              |              |            |            |
| 13 | 2017-2018  |           |           |         |         |         |        |              |              |            |            |
| 14 | 2018-2019  |           |           |         |         |         |        |              |              |            |            |
| 15 | 2019-2020  |           |           |         |         |         |        |              |              |            |            |

**Display 9. SDES\_DASHBOARD\_RET\_GRAD\_FILTERS table**

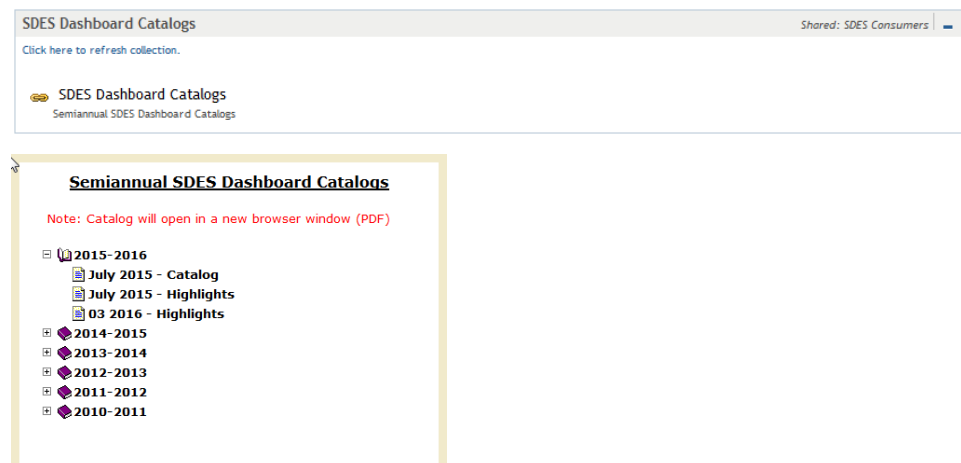
By using a lookup table, it saves a significant amount of time maintenance-wise, and rolling forward an academic year is intuitively very easy to do. An example of its use can be seen on the graphs and/or tables in Display 4, Display 5, Display 6, and Display 7 above.

## PDF REPORTS

Executive users at UCF requested the reports to be deliverable not only by desktops and portable devices such as tablets, but also as PDF files, for them to have access to a printed version of the reports anytime or anywhere, if needed.

After generating these PDF files by printing the reports to PDFs in Web Report Studio, combining them into a single file, and adding bookmarks for easy navigation, these files are made available through a web page and the link is accessible in the SDES Dashboards Catalogs portlet, in the SDES page of the portal.

The web page lists all the reports currently available, displaying three reports by academic year: preliminary highlights (using the number of the month when it was produced), final highlights, and the final catalog, which is usually created in July of each year (see screen capture, Display 10 below).



**Display 10. SDES Dashboard Catalog portlet with web page link (up) and web page display (down).**

Initially, a full catalog was generated. But due to its length, our SDES executive consumers requested a streamlined version and, consequently, the highlights version was used vastly across the unit. Also, a set of preliminary highlights was requested and it has since been provided with each iteration of the report.

## CHALLENGES

It was a great advantage to start this project with a set of already-defined indicators that users were already accustomed to. Also, another benefit was finding out that the necessary data was available in our data store. In addition, selecting the tool to be used within the SAS environment was an easy choice. SAS® BI Dashboard was immediately discarded due to its row limitation for data sources: building pre-summarized sets of tables per indicator was not an option when trying to design a project with over 400 indicators and with several years of data to display for trending purposes.

The first big challenge was designing elements to fit on one screen, especially in an attempt to avoid the scrolling of pages for users with tablets. A resolution needed to be set to design under such constraints, and the development station was set accordingly. And considering that Web Report Studio only allows an information map per section as a data source, it was easy to categorize the elements.

However, several maintenance concerns arose when combining the elements. The most notable concerns are as follows: changing titles and/or footnotes, and the intensive task of rolling forward a year in certain indicators (a common source of errors for a project this large in scope). Being able to create calculated fields at the information map level was really helpful in finding solutions for the latter concern.

The idea of using a lookup table to roll forward academic years for all retention, graduation, and progression reports was proposed by Patricia Ramsey, our current Director of Institutional Research. Using a lookup table was easy to implement and it is very easy to maintain. Our initial approach was adding section filters, but that is not as efficient to maintain as the table.

Creating indicators was very straight forward, but dealing with text boxes was a different story. While editing text boxes by formatting the text that was previously keyed in and when adding text as 'measure values', text box errors began to consume a lot of development time. This challenge was overcome by using multiple browsers in the design: while Firefox worked in solving the issue with text boxes, it was not the appropriate browser for the actual development of any report because Internet Explorer was much more effective in all other areas. So, switching back and forth between browsers allowed us to complete the design.

## PERFORMANCE

Our design goal was to offer a report section that loads in less than 30 seconds. This time frame was selected because we found that users are only willing to wait this amount of time before becoming concerned about a possible issue.

Fall Enrollment is the most labor-intensive report because of the time it takes to open due to the amount of data being crunched behind the scenes. The 'by Gender and Residency' tab (see screen capture, Display 2 above) loads in approximately 20 to 30 seconds. The rest of the sections in this report open in less than 20 seconds. The rest of the sections in all other reports (New Students, and Retention, Graduation, Progression reports) load in 5 seconds or less.

## CONCLUSION

Our SAS® EBI shop was able to transform a bi-annual process into a collection of reports available on demand through a secure connection, a reliable data source, and a maintenance process that only needs a few hours to prepare for a new cycle. Prior to this breakthrough, SDES invested two months, multiple personnel, and various resources to complete a very limited booklet that was plagued with inconsistencies.

The great responsiveness to this project opened the door to a very committed partnership between SDES and IKM, which over time, also expanded to other units, divisions, and departments across UCF's campus.

## REFERENCES

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Student Development and Enrollment Services (<http://www.sdes.ucf.edu/about>).

SAS Institute Inc. "SAS® Information Delivery Portal 4.4: Introduction." July, 2013. Available at <http://support.sas.com/documentation/cdl/en/idpintro/66144/PDF/default/idpintro.pdf>.

SAS Institute Inc. "SAS® Web Report Studio 4.4: User's Guide." June, 2015. Available at <https://support.sas.com/documentation/cdl/en/citug/65926/PDF/default/citug.pdf>.

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