

## Mobile Reporting at University of Central Florida

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### ABSTRACT

Mobile devices are taking over conventional ways of sharing and presenting information in today's businesses and working environments. Accessibility to this information is a key factor for companies and institutions in order to reach wider audiences more efficiently.

SAS® software provides a powerful set of tools that allows developers to fulfill the increasing demand in mobile reporting without needing to upgrade to the latest version of the platform.

Here at University of Central Florida (UCF), we were able to create reports targeting our iPad consumers at our executive level by using the SAS® 9.2 Enterprise Business Intelligence environment, specifically SAS® Web Report Studio 4.3. These reports provide them with the relevant data for their decision-making process.

### INTRODUCTION

At UCF the goal is to provide executive consumers with reports that fit on one screen in order to avoid the need of scrolling and that are easily exportable to PDF. This is done in order to respond to their demand to be able to accommodate their increasing use of portable technology to share sensitive data in a timely manner.

The university data warehouse is supported by the Enterprise Decision Support (EDS) unit of Institutional Knowledge Management (IKM). The user community, full-time faculty and staff, can access the university data warehouse through the Pegasus Mine Portal, 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.

The data warehouse currently contains over 17 years (more than 30 million rows) of student data based on official census files used for state reporting. The warehouse also contains additional source data (live, operational or siloed) from other university areas that are used to support custom reporting and information requirements.

The technical challenge is to provide specific data to those executive users requesting access through their iPad devices. Compatibility issues arise but are successfully bypassed. We are able to provide reports that fit on one screen and that can be opened as a PDF if needed. These enhanced capabilities were requested and well received by our users.

This paper presents techniques we use in order to create mobile reports.

### TECHNICAL CHALLENGES

#### SUPPORTED BROWSERS

Internet browsers other than Internet Explorer (IE) 6.0/7.0, and Firefox 2.0(3.0) are not officially supported by SAS® 9.2<sup>1</sup>. At this time there is a limited and unsupported browsing experience when using non-recommended browsers such as IE 8.0/9.0/10.0, Firefox 4.0 and higher, Safari all versions, Chrome, Opera, and others.

Not only do users need to be using the right browser to be able to get the information displayed properly without having technical issues on their desktops or laptops, but developers also need to design elements using these supported browsers. Failure to comply with this basic principle will result in technical problems and/or malfunction in the environment.

At the University, EDS developers' workstations are Windows 7 64-bit x64, originally installed with Microsoft's IE 8.0 (released on Q1 2009); a browser that presented a lot of challenges. To prevent compatibility issues, IE8 includes the IE7 rendering behavior: compatibility mode. It needs to be activated when using IE 8.0 as a user and as a developer. Even with that feature on, unexpected/erratic behavior could occur specifically in the developing environment.

#### ALTERNATIVE BROWSING EXPERIENCE

We have found a more reliable environment when designing reports using SAS Web Report Studio on any version of Firefox with the add-on IE Tab V2<sup>2</sup> installed (last time a report was developed without issues was on Firefox 26.0). This successful combination was discovered a couple of years back after several frustrating hours dealing with errors related to text boxes in Web Report Studio while creating reports.

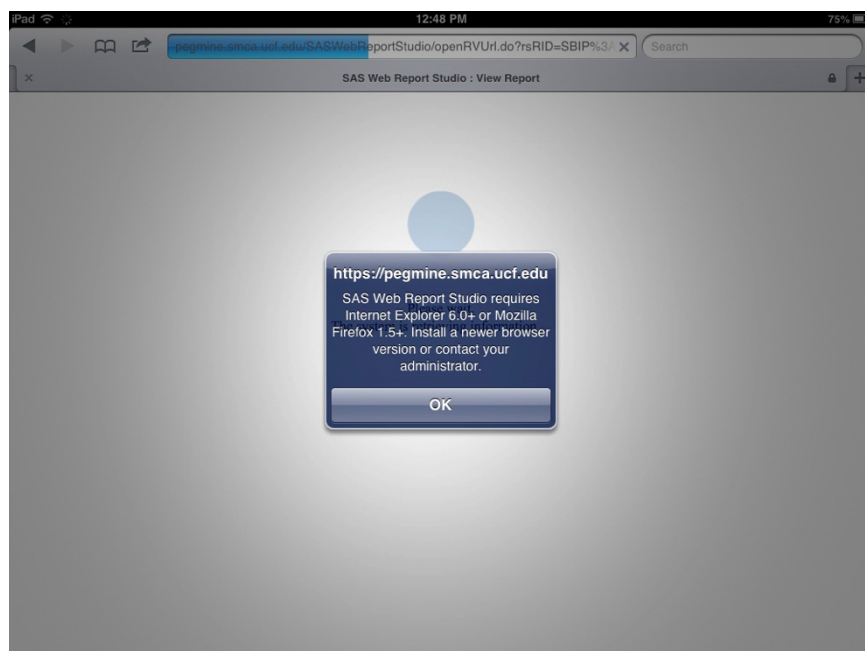
The add-on IE Tab V2 needs to be set to 'IE7 Standards Mode' (IE Compatibility Mode) and the portal session should be opened using the add-on (use the 'enable sites filter' option). Please note that this add-on only works in the PC version of Firefox.

This choice is found to be more reliable than using IE8, IE9, and IE10 in compatibility mode when designing reports. But avoid recommending this option to desktop users in Windows 7 and Windows 8 environments unless they encounter an important issue while using IE9 or IE10 in compatibility mode (usually there are no problems when viewing reports, only when designing).

## IPAD EXECUTIVE USERS

Smartphones and tablets are part of today's businesses and working environments. Accessibility of sensitive information in a timely matter is key in operational decision-making and strategic planning. The iPad's first appearance was in Q1 2010, and it was very popular by 2011. Executives at UCF replaced their laptops with iPads due to its portability. Then they hit a wall: none of our SAS Web Report Studio reports opened in the portal without giving an "error message."

Apple's default browser, Safari, is a non-supported browser. Not only a message saying to install a newer browser version or to 'contact your administrator' is being displayed while trying to open a report (see screen capture, Display 1 below), but also errors and malfunctioning reports behavior is expected.



**Display 1. Message displayed while trying to open a SAS Web Report Studio report in iPad's Safari**

It was imperative to solve the browsing experience on the iPad while using the portal environment reports. A hunt for a third party browser for the iPad started. After exhaustive research and testing of several options a cheap, but solid solution was found: Atomic Web Browser<sup>3</sup>.

If using an iPad, Atomic Web Browser is the recommended browser at UCF due to its native full screen and 'identify browser as' features. This last feature allows the browser to 'pretend' to be desktop Firefox 3 (among other options), which prevents a system alert in the Pegasus Mine Portal when using non-recommended browsers.

Although the Atomic Web Browser is unsupported, with testing, we have verified it can be used with good results. Atomic Web is available in the Apple App Store for a small fee. Atomic Lite is not recommended. Note that even though Atomic Web Browser could be also identified as IE6 or IE7, the compatibility alert is still being triggered.

## MOBILE REPORTS

After being able to bypass the compatibility mode issues on the iPad, the challenge was to convert or adapt reports to a web resolution of 1024x768 in full screen mode in order to avoid the need of scrolling when using the device. In order to do that, the screen resolution was set to 1024x768 (while using a 24 inch screen with native resolution of 1920x1080) and put in full screen mode to mimic the appearance on the iPad while working on the development using SAS Web Report Studio.

## SAMPLES

The following screen captures correspond to developed projects that comply with all requirements mentioned before in order to be properly displayed on the iPad.

### SDES Dashboard

The screen capture presented on Display 2 is from a project developed thanks to the combined effort of Student Development and Enrollment Services (SDES), Institutional Research (IR), and EDS. SDES provided IR with a book containing a set of reports generated manually twice a year. SDES expended an enormous amount of time and effort creating the book on preliminary and final phases. They had no control on the data displayed (coming from different sources on each iteration of the report) and they had to feed it manually using Microsoft Word and Microsoft Excel for this purpose. The amount of error in the data reported was pretty high. They used to invest between 8 and 10 weeks each time they created this book.

The book was redesigned in SAS Web Report Studio by creating a set of 5 main reports. Each report contains between 3 and 9 tabs (or sections) depending on the content. Two of the five reports use report-linking capabilities (11 reports are really behind those two front end reports). A total of 67 sections were created to mimic the original book. Each section is reading an information map that was created using SAS® Information Map Studio. Some information maps already created for other projects were used in this one, but new information maps were also created. The new tables that feed the new information maps were put together in SAS® Enterprise Guide® projects.

The information behind each report is official warehouse data (same source). Development took 3 months of part-time effort to create this project. Cyclical updates only require 1 hour of maintenance.



**Display 2. SDES Dashboard, Fall Enrollment**

Besides providing reports that can be opened using any computer or an iPad on demand, a set of 3 PDFs are being provided semi-annually: a preliminary version with highlights of 12 different sections, a final version of the same highlights, and a final Catalog (100 pages book). A total of 5 days is invested in order to create these documents. All PDFs provided have bookmarks for easy navigation.

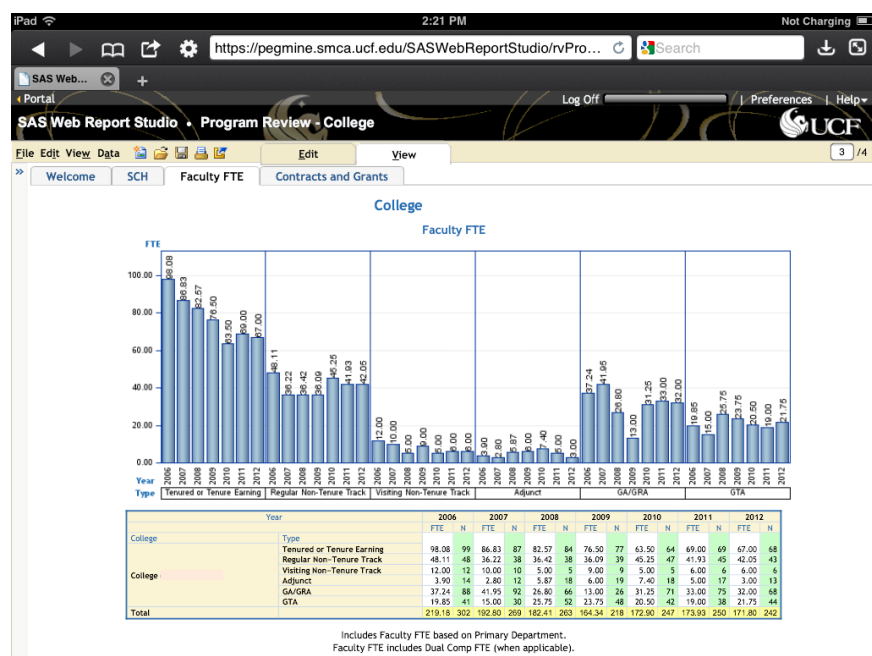
## Program Review

This project has more than 10 years of evolution history at UCF. It evolved from a manual effort using Microsoft Word (2000), to Microsoft Access (2003), to SAS Enterprise Guide and Microsoft Excel pivot tables (2006), to SAS Enterprise Guide (2008), to SAS Enterprise Guide and SAS Web Report Studio (2012).<sup>4</sup> Also, a printed version for each program under review has to be provided to external consultants (PDFs with bookmarks).

Program Review is mandated by state statute, is a 7-year cycle, and evaluates approximately 30 programs per year. By using the previous iteration of Program Review created with SAS Enterprise Guide (2008-2011) it used to take in-between 3 and 4 weeks to generate these reports (for programs under review only). Now it takes no more than 4 days to provide the data for all programs (not only for the ones under review) each new cycle. IR waited for cascading parameters to be available in SAS Web Report Studio to fulfill this improvement.

A total of four SAS Web Report Studio reports were created in order to mimic the reports previously created. Users are prompted in order to filter the information behind the scenes. Additionally, dynamically generated values and cascading parameters are being used. Information maps used by SAS Web Report Studio create views of the data stored in warehouse tables that were generated with SAS Enterprise Guide projects created for this new iteration of the development.

Even though these reports were created to be used on a desktop computer, and to be eventually surfacing on a web page as PDFs, some of the sections created in this project can be perfectly viewed using an iPad (see screen capture, Display 3 below).



Display 3. Program Review, College level, Faculty FTE

## CBA Dashboard

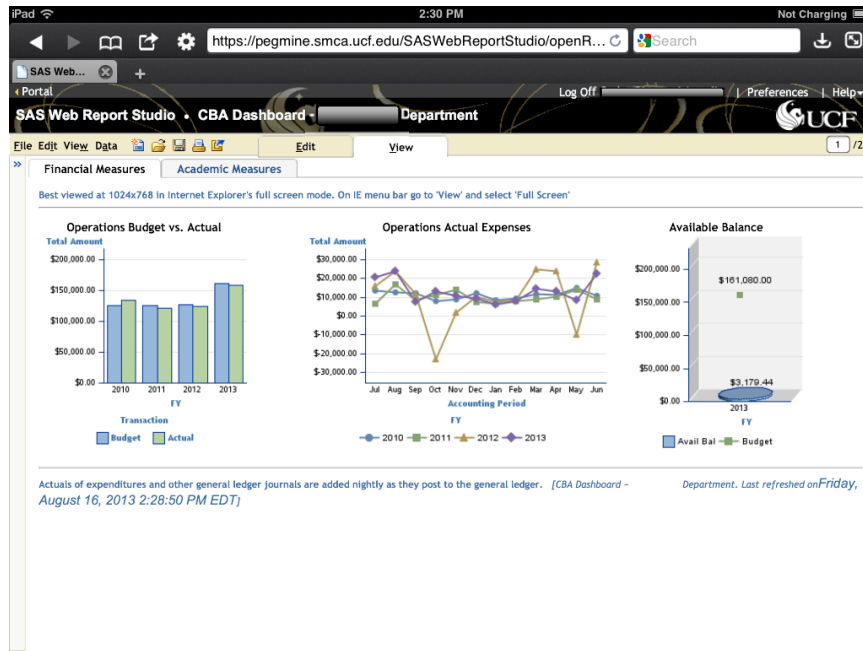
This was a huge pilot project back in Q4 2010. Development lasted 9 months. Three months were invested in literature research, defining key performance indicators to be used, and looking for tools that might help in the creation of this project; three months were invested in forming the necessary connections among different entities on Campus in order to be able to access the data needed; two months were needed to play and get familiarized with selected development tools: SAS® Stored Processes, SAS® BI Dashboard, SAS Enterprise Guide, and SAS Web Report Studio. The last month was used for development and documentation. The entities involved were College of Business Administration (CBA), UCF Finance & Accounting (F&A), and IKM/EDS.

As a result, 15 reports were created for a total of 24 sections. Seventeen sections are related to financial measures and 7 sections are related to academic measures. Each report was created for a specific Unit or Department of CBA.

The data warehouse only stores student data and has no financial information. Connections to F&A server were made, but it was required that every time a report is opened, the data has to be pulled on-demand into a temporary table that is dumped once the report is closed. EDS created a SAS Stored Process for this sole purpose.<sup>5</sup>

It takes a minute and twenty seconds for the financial measures to surface each time when opening a report due to policy barriers imposed. On the other hand, a warehouse information map already in place was used for the academic measures section of the report that takes no more than 5 seconds to appear after it is click on.

The following screen capture, Display 4, shows a 'financial measures' section originally design to be best viewed at 1024x768 in full screen mode, requirements that comply with our iPad report design restrictions.



**Display 4. CBA Dashboard, Financial Measures**

## CONCLUSION

Today's increasing demand for information goes hand-in-hand with accessibility granted by new gadgets and its applications. Relevant data is also a key factor to change the course of events, and when used in a timely manner, it is even more powerful. Despite pitfalls, workarounds can be found in order to make things work, even with tools not designed originally to fulfill those specific goals. Mobile reporting at UCF is a possibility thanks to a combination of technologies, factors, and efforts working together towards a specific goal.

Technology is in constant transformation and evolution, changing faster every day. It also has an associated cost that is not necessarily worth paying in such a short period of time... because it keeps changing.

## REFERENCES

1. SAS Support. "SAS® 9.2 Support for Web Browsers and Plug-Ins." support.sas.com. February 15, 2012. Available at <http://support.sas.com/resources/thirdpartysupport/v92/browsers.html#browsers>
2. ietab.net. "IE Tab V2 (Enhanced IE Tab)". ietab.net. June 30, 2013. Available at <http://www.ietab.net/>
3. Richard Trautvetter. "Atomic Web Browser - Full Screen Tabbed Browser w/ Download Manager & Dropbox." October 10, 2012. Available at <https://itunes.apple.com/us/app/atomic-web-browser-full-screen/id347929410?mt=8>
4. Ramsey, Patricia. Piemonti, Carlos. "Evolution of Program Review at UCF - Using SAS Business Intelligence Tools to move Towards Optimization." FAIR Conference. January 31, 2013. Available at [http://www.iroffice.ucf.edu/presentations/FAIR\\_2013\\_IR\\_Presentation.pptx](http://www.iroffice.ucf.edu/presentations/FAIR_2013_IR_Presentation.pptx)
5. Murray, Maureen. "Deconstructing Barriers for Dashboard On Demand Data." SAS Global Forum. April 6, 2011. Available at <http://www.iroffice.ucf.edu/presentations/SAS011-2011.pdf>

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## RECOMMENDED READING

- *Business Dashboards*. Wiley. 2009
- *Information Dashboard Design*. Analytics Press. 2013

## CONTACT INFORMATION

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