

Developing Flexible Reports to Respond to Routine External Data Requests

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ABSTRACT

External data requests are a common reporting need within a large university. Many organizations, from apartment complexes to graduation stationery providers, are interested in the names and addresses of our students. The responsibility for coordination and response to these types of external organizations is shared between functional and technical team members. Many of the requests follow a similar pattern and structure, only deviating with two or three specific value selections. To improve the timeliness and efficiency of request responses, a menu of standard reports were created and shared through the Information Delivery Portal. These reports are designed in Enterprise Guide and are accessed via the portal. Although access is still restricted to our office, the portal allows for report flexibility by using common field parameters, provides multiple output options, and ensures proper security by requiring login authentication. This presentation will detail the development, testing and release of our university's external data request solution.

WHO WE ARE

Mission

The mission of the Office of Institutional Research is to provide information of the highest quality, and which is both timely and easily accessible, and to facilitate and enhance decision-making, strategic planning, and assessment at the University of Central Florida.

Purpose

Institutional Research (IR) provides electronic and web-based dissemination of official information to the University community (including the Board of Trustees, the various colleges, departments and other academic and administrative units), external agencies, and the Florida Board of Governors (BOG). IR generates, supervises or develops all official University data reports and state-required reports, as well as providing end-user data solutions and training to facilitate decision-making processes. The director and staff serve on numerous university-wide committees and workgroups and assist with the collection and interpretation of institutional data, assist in planning academic programs, and participate in the implementation of evaluative procedures. The functions of the office support the entire university enterprise.

Background

Institutional Research has, as one of its primary objectives, the task of developing and implementing a university data warehouse. This enterprise-wide data system will facilitate the creation, access, and dissemination, by internal and external stakeholders, of institutional knowledge pertinent to the university. In collaboration with the data warehouse project stakeholder group, which represents a variety of key data users, the IR staff has established a data source of ten years' worth of student reporting data. This warehouse of information serves as the foundation for the development of a wide variety of reporting applications using SAS® Business Intelligence software.

INTRODUCTION

The University of Central Florida (UCF) is required to share public records under Florida's 'Sunshine Law'. The Office of Institutional Research (IR) is responsible for providing directory information to outside vendors upon request. These requests are often mailing lists designed to reach an appropriate student market that may have a specific need, such as graduation supplies, off-campus housing, or class rings. IR is required to respond to outside vendor requests in a timely manner, providing output in pre-determined formats. Many vendors replicate their data requests each semester, with some vendors requesting updates periodically throughout the semester. In order to move this responsibility from a technical user to a functional user, routine reports were designed and made accessible to select users through the SAS® Information Delivery Portal. The resulting design provided increased security and flexibility, which were essential elements of the project.

REPORT APPLICATION DESIGNS

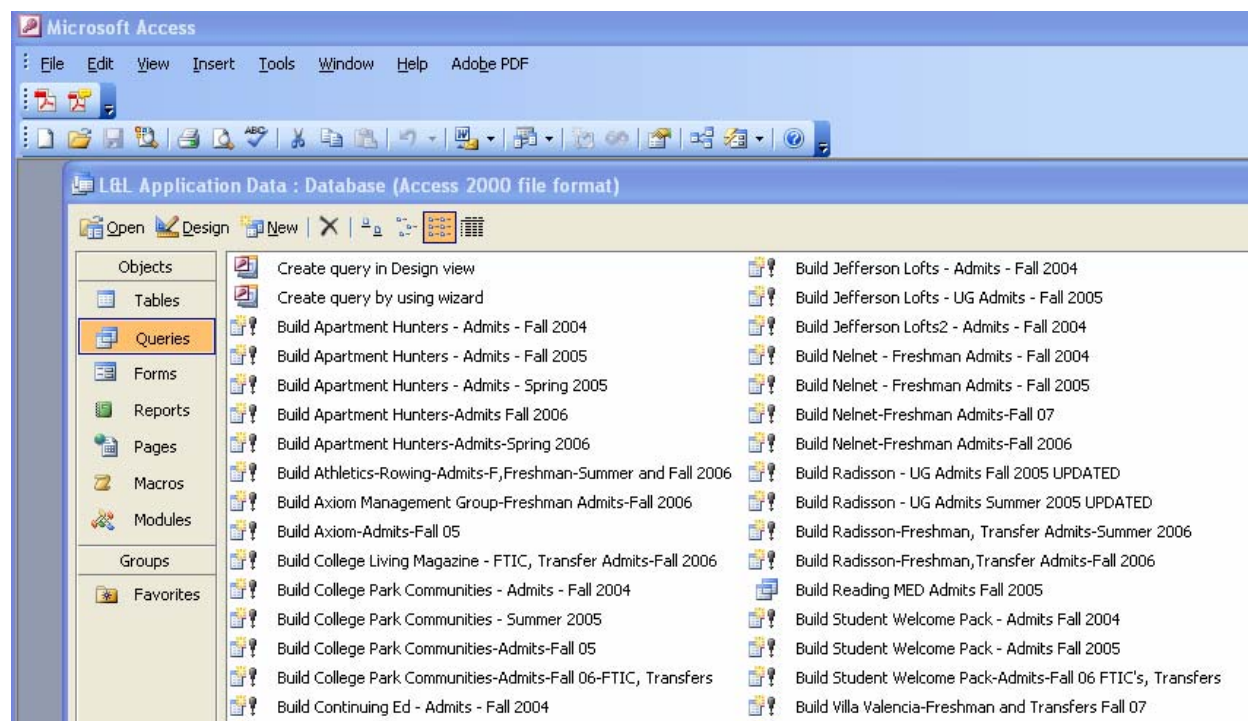
History

Vendor data requests at UCF were historically done with support of Computer Services programming staff. This responsibility was later moved to technical users housed in IR. To maximize staffing efficiency, routine requests were later assigned to administrative staff. These staff members had broad job responsibilities and required reporting designs that were user friendly, ran quickly, and required no coding experience. The resulting output had to be available in formats requested by the vendors and stored in a location that was secure and easy to retrieve. The design of the current project went through multiple stages, which are outlined below.

Microsoft Access Version

The first solution for a shared reporting environment was to create multiple Microsoft Access Database projects, which were placed on a shared server. The projects extracted data from current MS SQL Server data tables using ODBC connectivity. To increase 'readability', data labels were provided for unfamiliar field names, and query variables were changed to use long descriptions rather than codes. These changes gave the administrative staff increased confidence in the resulting dataset. An example of the queries page from one project is displayed in Figure 1.

Figure 1



This solution had a number of advantages over the previous method. For instance, coding experience was not needed and Microsoft Access was already available on the users' workstations. The required logic for table joins was designed for the user, and the filters were performed on fields with common terminology rather than less intuitive codes to decrease user error (ex. 'Fall 2006' rather than '1280' for term.) The resulting dataset could be exported to Microsoft Excel for additional manipulation or formatting to send to the vendor.

Although this design was effective, it had some weaknesses that IR sought to overcome. The projects were stored on a shared server that was accessed by a larger group of users than the select few who ran them. Although a userID was required to run a query, the output tables and the design of the input tables could be viewed by any individual with rights to the shared server. Additionally, Microsoft Access has limitations on size of output files and is sometimes sluggish when exporting large datasets. The database required monitoring for the need to compact and repair. (Staff members in IR have had Microsoft databases become unusable when they get too large.) Finally, the user was

working with the original project design (rather than a copy) and could inadvertently alter or delete parts of the query or database design.

SAS Attempt #1

IR staff includes data warehouse team members who have been hard at work loading and cleaning historical data, and exploring SAS Business Intelligence tools for use with the warehouse. This team recently completed a project that passes a single sign-on through the University portal to the SAS Information Delivery Portal where the data warehouse reporting environment resides. A future goal is to have all reporting originate from the data warehouse. In addition to historical data, the same current data tables referenced in the Microsoft Access database project above are available as registered tables in SAS® Enterprise Guide, accessed through an ODBC connection.

The first SAS solution included an Information Map that was restricted to common elements. It would allow recoding of table field names to easily understood labels, and apply the FERPA filter that protects records that should not be available for public view. This solution was effective in theory; however IR was unsuccessful in building this map from ODBC tables due to security restrictions.

SAS Attempt #2

SAS Enterprise Guide (EG) allows designers to create stored processes, which perform a sequence of steps in the project and displays the outcome. Stored processes may be designed with parameters that prompt the user to restrict the outcome to meet the needs of the consumer. A common prompt may be for reporting term or number of hours completed by a student.

The second SAS attempt included a stored process of a sequence of steps designed in an EG project. This design was abandoned when IR learned that the designer's userID and password were embedded in the stored process. The intent was to create a secure environment that required each user to provide their own user ID and password for the ODBC tables. These criteria would provide the appropriate level of access to the ODBC tables, since different users have varying levels of access to these datasets. It would also ensure that individuals who have portal access but who may not have rights to the ODBC tables cannot generate these reports.

When running a stored process, the user was not given the opportunity to review or alter the design of the projects. IR preferred to have the query design and filters available for review and alteration if appropriate for each vendor job. This was an additional shortcoming to the stored process solution.

SAS Attempt #3

The final version of the reporting solution for external data requests was accomplished in a multi-step process as detailed below. Projects are designed in EG, stored on a secure server, and accessed via a portlet made available to select users through the Information Delivery Portal.

PRODUCTION APPLICATION

Overview

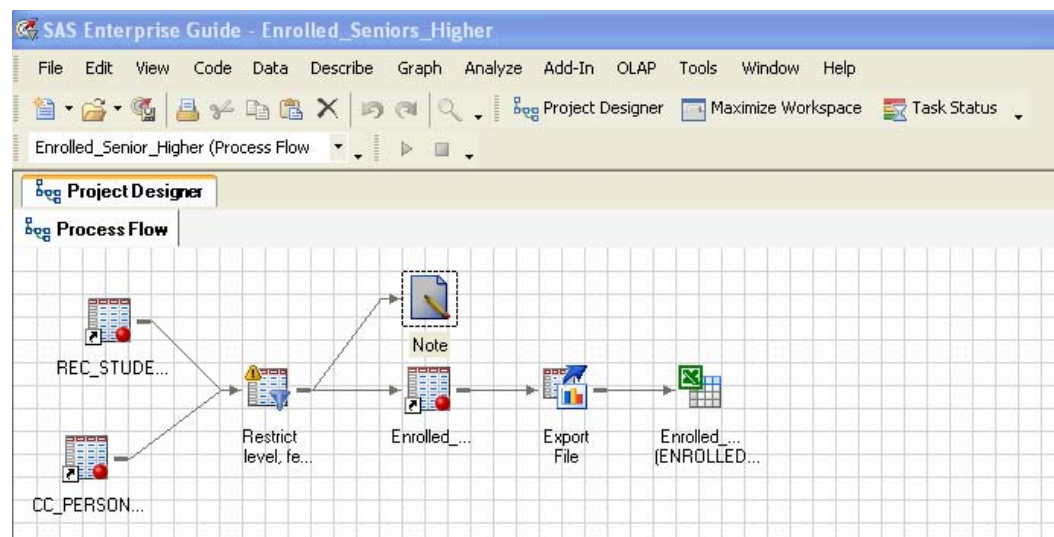
The SAS reporting solution currently in use overcame the various weaknesses identified in earlier attempts. It maintains a high level of security, allows flexibility in design, and is user friendly.

The small group of users who have permission to access the portlet and the link providing access also have SAS Enterprise Guide installed on their PCs and have the appropriate folder created on their C:\ drive to capture the resulting output. They are comfortable using EG for querying, and confident altering the filters if needed. One advantage of the final solution is providing access to the project design.

EG Design

Figure 2 displays an EG project that is designed to query two ODBC tables and export the output to an Excel file stored on the users' PC.

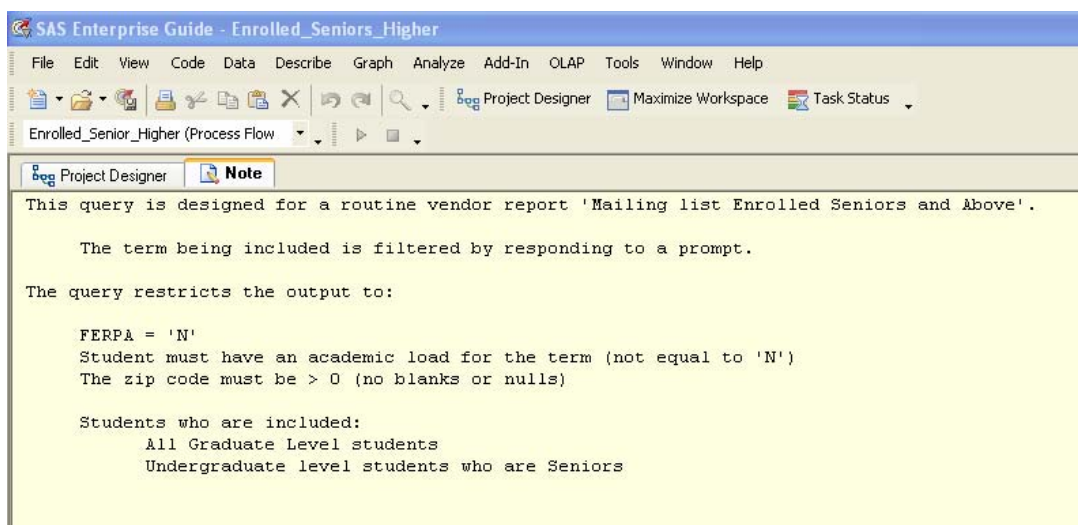
Figure 2



The query output is sent to the SAS 'WORK' library, which houses temporary files. The temporary files are then exported as permanent Microsoft Excel files to an existing folder on the user's PC. The user then has the opportunity to rename the files, relocate them, or alter them if needed using the tools familiar to them in Microsoft Excel.

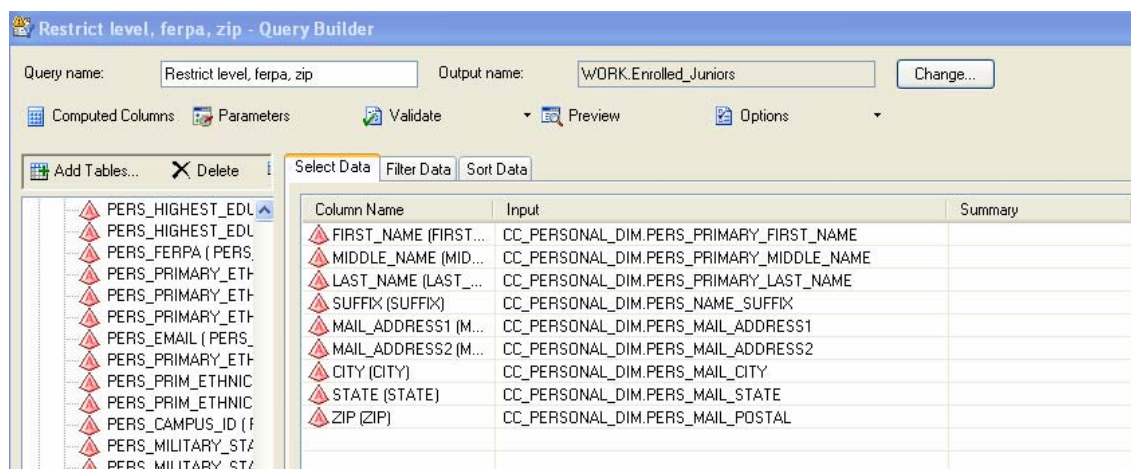
The user can reference notes that are included in each project that summarizes the original filters and intent of the project, as displayed in Figure 3. These notes will provide a user-friendly synopsis of the project and alert the user to intentional design features such as filters or calculated fields.

Figure 3



The users will have the opportunity to alter the query or any part of the project if needed. The original project is stored on a server, so they cannot corrupt the original design. The version they can alter is a downloaded copy that resides on their PC. The user can view the output fields and the labels they have been assigned, as shown in Figure 4. If computed columns are part of the design, they can view and alter the design of those fields.

Figure 4



Enterprise Guide allows for grouped filters, which are intuitive when shown in the graphical display. This user-friendly feature provides a clear visual representation of the filters used in the query and can be easily modified by a user without any coding experience. Figure 5 displays filters and their corresponding grouping that a user may view and alter.

Figure 5

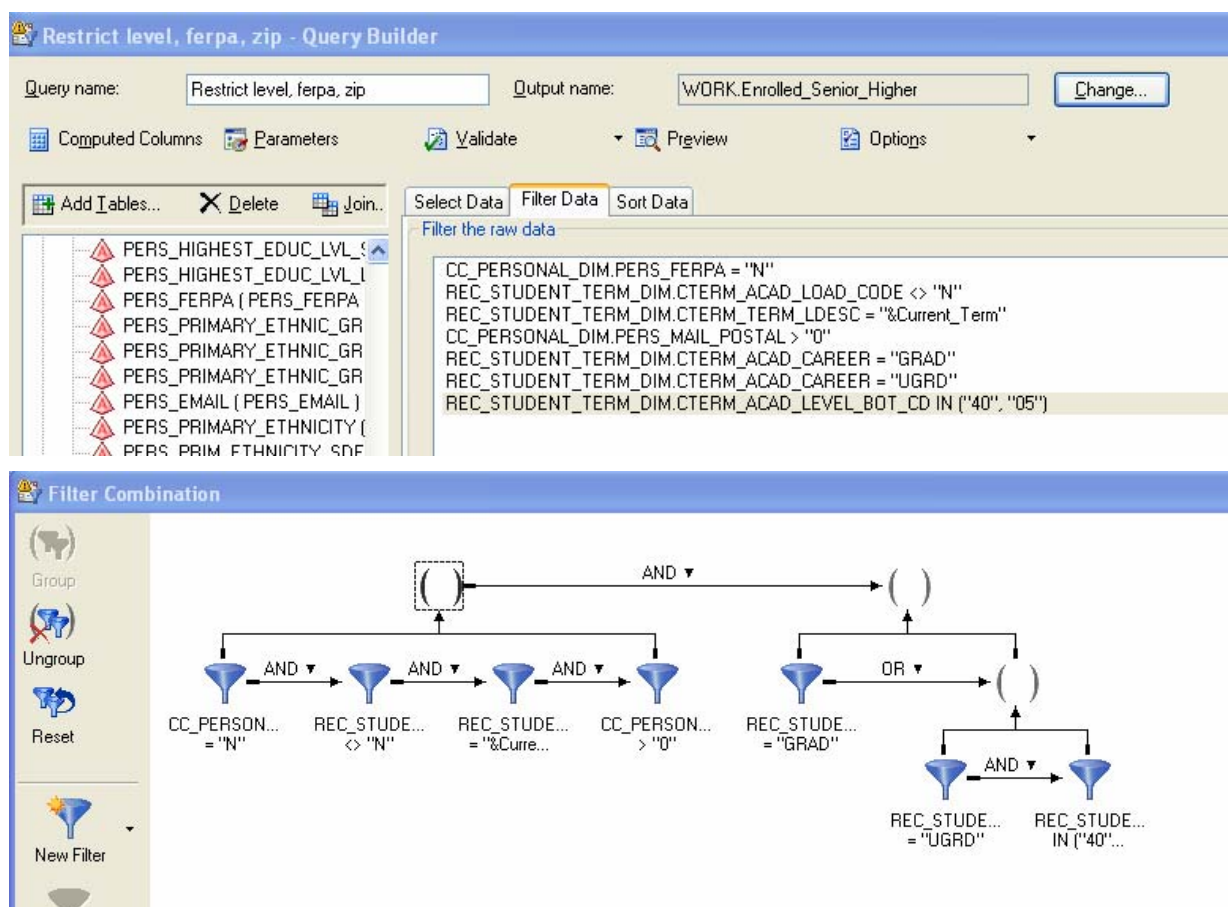
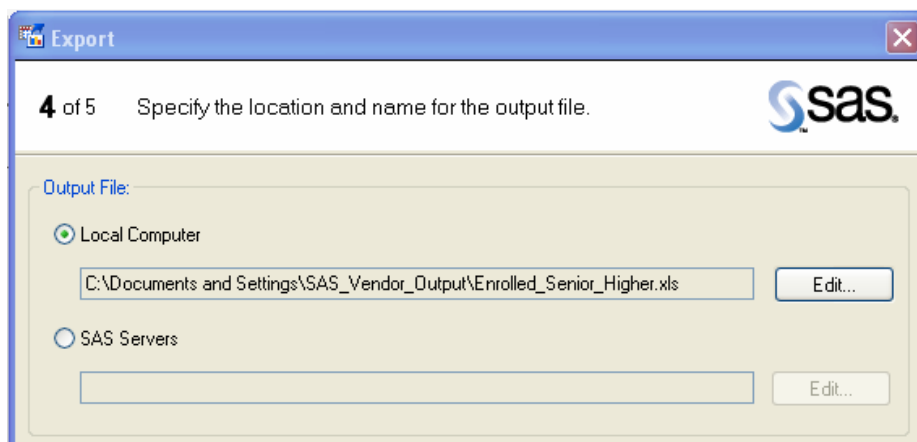


Figure 6

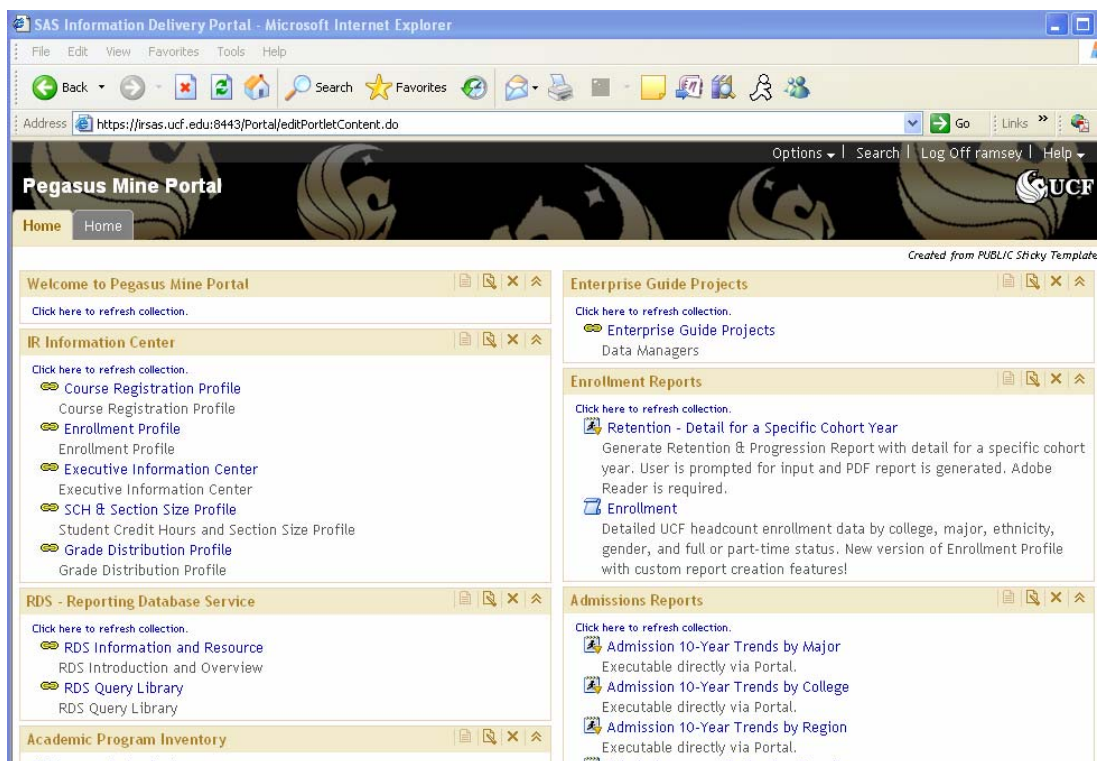


When a user runs the steps in EG and completes both the query and the export process, an Excel file is created and stored in a folder located on the user's local computer. The output location is shown above in Figure 6. The benefit of this design is to have a temporary file on the SAS server, and a permanent file on the local computer. When the EG session is closed, the temporary file will no longer take up space or have security conflicts when the steps are repeated for another vendor or term. The user will have the opportunity to relocate and/or rename the permanent file if they don't want it replaced when the project is run again in the future.

SAS Information Delivery Portal Access

Qualified users will be granted access to a listing of EG projects that have been developed for their pre-defined needs. Those users will be granted security access to add a portlet for 'Enterprise Guide Projects'. Figure 7 displays a portal page for a user who has this level of security, and has added the portlet to their personal page.

Figure 7



When activating the link, the user is sent to a web page that displays all the EG jobs and lists ongoing vendors who may request those reports. The EG projects are stored on a secure server and will be downloaded to the user's local PC for processing. This web page is displayed in Figure 8.

Figure 8

Enterprise Guide Projects	
	<u>Date Last Modified</u>
Applicants	
 Mailing addresses of all new admits for prompted term - FERPA restricted	7/1/2007
Apartment Hunters - Admits	
 Mailing addresses of new FTIC admits for prompted term - FERPA restricted	7/1/2007
Axiom Management Group	
Educational Direct - FTICs	
Gatherings - FTIC	
GMG Transport	
Nelnet - FTICs	
 Mailing addresses of Undergrad admits (FTIC and Transfer) for prompted term - FERPA restricted	7/1/2007
College Living Magazine	
College Park Communities	
Gatherings - FTIC and Transfer	
Jefferson Lofts	
LEADS Scholars	
Radisson	
Student Welcome Packs	
Villa Valencia	
Villages	
Watson Realty Corp.	
 Mailing addresses of all new USA admits for prompted term - FERPA restricted	7/1/2007
Educational Direct - all USA	
Enrolled Students	
 Mailing addresses of all new admits for prompted term - FERPA restricted	7/1/2007
 Mailing addresses of enrolled students for prompted term Seniors and Above - FERPA restricted	7/1/2007
Ad Council	
 Mailing addresses of enrolled students for prompted term- Seniors and Juniors- FERPA restricted	7/1/2007
Network Direct	
 Mailing addresses of enrolled students for prompted term- Seniors in select Zip codes- FERPA restricted	7/1/2007
Webster University	
 Mailing addresses of enrolled students for prompted term- Seniors with > prompted hours- FERPA restricted	7/1/2007
Campus Graduation Supplies	
Signature Announcements	
 Mailing addresses of enrolled students for prompted term- Juniors- FERPA restricted	7/1/2007
Balfour - Juniors	
 Mailing addresses of enrolled students for prompted term- Freshmen- FERPA restricted	7/1/2007
Campus Direct	
Central Florida Hillel	
 Mailing addresses of enrolled students for prompted term- Fresh, Soph, Junior - FERPA restricted	7/1/2007
Jefferson Villages	
 Mailing addresses of enrolled students for prompted term- Fresh, Soph, Junior Select Zip codes- FERPA restricted	7/1/2007
Broward Community College	
 Mailing addresses of enrolled students in selected majors for prompted term - FERPA restricted	7/1/2007
Air Force	
Grades	
 Counts of grades (limit to 'DIS','SEM','LEC','LAB' sections with enrollment >4 - no plus/minus)	7/1/2007
Pick-A-Prof	
Graduation Intents	
 Mailing addresses of enrolled students filing an intent to graduate for prompted term - FERPA restricted	7/1/2007
Direct Student Services	
Gallery Announcements	
Professional Framing Company	
Signature Announcements	

IR encountered some challenges in the delivery process, such as having the server recognize the location and format of the EG projects. The file extension of .egg was being interpreted as .zip. With research, we overcame these challenges and can provide technical details upon request.

CONCLUSION

The exercise of moving through various alternatives to seek IR's desired outcome was quite informative. The lessons we learned will be applied to future development of reports using SAS software as the warehouse implementation continues.

There are many benefits that surfaced in the final design. Security is tight since the user must have appropriate portal security to add the portlet and the corresponding link to their portal page. ('Enterprise Guide Projects' will not appear as an option if they are not in the appropriate reporting group.) In addition, the user must have the software for SAS Enterprise Guide installed on their PC, or they will not be able open the project. This limitation also restricts access. Security is again checked when running the steps in a project, because the user must input a valid userID and password to access the ODBC tables. The risk of altering the original project design has been removed because users must download a copy of the EG project to their local computer. These features, along with the flexibility to alter a local copy of the project, review notes, view filters and display table joins gave IR results that satisfied all their requirements.

The shared projects are safe yet accessible to the designated staff members, user friendly, and require no coding. The results have been welcomed with enthusiasm by all potential users.

ACKNOWLEDGMENTS

We'd like to thank:

Maureen Murray and Ali Yorkos for assistance with SAS Information Portal security access and server support.

Jared Bott for investigating and solving Windows download challenges.

Anne Ryder for web design and ongoing support of the Enterprise Guide Portal web page.

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