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ABSTRACT
The Coordination for the Improvement of Higher Education Personnel (CAPES) is a foundation within the Ministry of Education in Brazil whose central purpose is to coordinate efforts to promote high standards for postgraduate programs inside the country. Structured in a SAS® data warehouse, vast amounts of information about the National Postgraduate System (SNPG) is collected and analyzed daily. This data must be accessed by different operational and managerial profiles, on desktops and mobile devices (in this case, using SAS® Mobile BI). Therefore, accurate and fresh data must be maintained so that it is possible to calculate statistics and indicators about programs, courses, teachers, students, and intellectual productions. By using SAS programming within SAS® Enterprise Guide all statistical calculations are performed and the results become available for exploration and presentation in SAS Visual Analytics. Using the report designing tool, an excellent user experience is created by integrating the reports into Sucupira Platform, an online tool designed to provide greater data transparency for the academic community and the general public. This integration is made possible through the creation of public access reports with automatic authentication of guest users, presented within iframes inside the Foundation’s platform. The content of the reports is grouped by scope, which makes possible to view the indicators in different forms of presentation, to apply filters (including from URL GET parameters), and to execute stored processes.

INTRODUCTION
Sucupira Platform is an online application built to collect and analyze data from the Postgraduate Nacional System. It also provides real-time detailed information for the academic community about the system in order to improve transparency and reduce time and efforts on the evaluation of the SNPG.

The storage of information submitted by postgraduate programs makes feasible the establishment of a series of analytical processes including data cleansing, data handling, data processing and reports creation and distribution. These processes are developed internally with the help of SAS Enterprise Guide and SAS Visual Analytics, which raises new insights and understanding about Brazil’s postgraduate education.

This paper illustrates the steps associated with the process of collection, analysis and dissemination of information under the reality of the Coordination for the Improvement of Higher Education Personnel in Brazil and shows the roles of SAS throughout the process.

DATA COLLECTION, STORAGE AND ACCESS
Postgraduate Programs send through Sucupira Platform information about the programs, courses, teachers, students, scientific productions, and others. The transactional data is stored inside an Oracle Database and integrated with SAS Enterprise Guide, so that is possible to generate statistics about the Postgraduate Nacional System. After going through validation and analysis, the date are presented for different types of users who consume this information: the programs themselves, the evaluation areas and the country’s population as a whole. The entire process is shown in Figure 1.
So, despite having been simplified in the flowchart, the process involves different profiles of professionals (IT professionals, front-end and back-end developers, statisticians, managerial profiles) and users.

**DATA PRESENTATION WITH SAS VISUAL ANALYTICS REPORTS**

After performing the data validation, data analysis and constructing the auxiliary tables, it’s time to start talking about data presentation and distribution.

**IMPORTING DATA INTO SAS VISUAL ANALYTICS**

Importing data into SAS Visual Analytics is a quite simple task. With a couple of clicks the analyst takes care of it. Although, in a multi-user system, it’s important to guarantee an internal organization of files (tables, reports, explorations). Otherwise, things can get messy with time. Apart from that, importing data is a straightforward task. What makes this job a little more complicated is the need to maintain the data up to date. In other words, the necessity on automate all the process. One way to accomplish this step is to schedule the process inside Linux using Cron.

**CREATING REPORTS**

SAS Visual Analytics is definitely a user friendly module. So, now that the data is available, we are ready to take our next steps on creating reports just by dragging and dropping objects. Therefore, it’s not strictly necessary to make a formal planning on your dashboard layout. Yet, to make the work more efficient, it is important to have in mind at least a draft of your ideas. At this point, assume that we’ve already started to build the report. The first and second report screens are shown at Figure 2 and Figure 3.
Figure 2. Report - Programs Session

Figure 3. Report - Courses Session
The Report URL

Now that we’ve started to build the report, we might want to access it from a URL. It is possible to get the report URL just by clicking on File -> E-mail and then copy the URL from the e-mail body, like shown in Figure 4.

Figure 4. Getting your Report URL

Perform Filtering with URL GET Parameters

It is also possible to filter the report results only by adding a ";parameter=VALUE" to its URL. For instance, if you want to filter the report for the year of 2016, you can create a parameter YEAR, apply it to a controller object and call the URL shown in Figure 4 adding "&YEAR=2016" to it. So, the expected URL would be http://your-report-url&YEAR=2016. In our case, it was necessary to add other parameters, like region, program level, and others.

Using Stored Process to Export Data in Modern Version

One of the features that it’s no longer available in Modern (HTML5) version of SAS Visual Analytics is the data exportation. In the Classic version, it is possible to export the data to an Excel spreadsheet by right clicking the object and selecting “Export to Excel”. To make use of the Modern version, we’ve decided to create a stored process which prints the table into HTML and creates a button which exports the data to CSV. We also needed to add a little bit of Javascript to the code, as shown next.
As a final result, the stored process is executed in a specific report session and the user exports the data to CSV on the click of a button.

INTEGRATING THE REPORTS BACK INTO SUCUPIRA PLATFORM

Finally it’s time to go back to Sucupira Platform and present the reports to the final user. To access the report, the user must be logged in, at least anonymously. So, the first step is to change the report URL to automatically log an anonymous user into SAS Visual Analytics. The guest access will be available at URL “http://host/SASVisualAnalyticsHub/guest.jsp”.

After making some changes in URL Parameters to view the Report like described here, the final URL has the form “http://host/SASVisualAnalyticsViewer/VisualAnalyticsViewer_guest.jsp?reportName=report-name&reportPath=/path/to/report&reportViewOnly=true&appSwitcherDisabled=true&YEAR=year&otherFilter=value” and is presented within iframes inside Sucupira Platform. The users in a mobile environment are redirected to SAS® Mobile BI before accessing the reports.
CONCLUSION

According to the reality of CAPES, this paper presented some of the steps associated with the process of collecting, analyzing, presenting and distributing information of the Postgraduate Nacional System using SAS Enterprise Guide and SAS Visual Analytics. It was also shown a way to integrate SAS Visual Analytics reports with a web application by using iframes. One of the main findings was the possibility of using a stored process with Javascript code to export the data source to the final user and meet this need without losing the advantages of Modern View.

CONTACT INFORMATION

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