

The USF InfoMart: an Electronic Report Delivery System

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Abstract

*Looking for information about USF? All you need is a computer and web-access. We've produced an application called the **USF InfoMart**. Data streamlined to your needs are available with the click of a few buttons: <http://www.usf.edu/usfirp/infomart/>*

*The **USF InfoMart** is intended to provide management information, both summary and detail, to interested users on campus and in the general community. Data include a spectrum of University resources, including headcount, credit hours, courses, degrees, employees, and more. You can view, print, or download the data into your own PC to design spreadsheets to meet your specific needs. The application includes fifteen semesters or more of data and is updated at specific benchmarks each term, making data useful for point-in-time comparisons and historical trends or future projections.*

*The **USF InfoMart** not only allows dynamic access to current information but also includes academic department profiles, a retention reporting system, a built-in usage tutorial called iTraining, and links to data publications like the University Fact Book.*

*As a result of the **USF InfoMart** development, data are more accessible, timelier, and the need for time and cost consuming paper-based reports has been eliminated.*

Introduction of the Organization

While the status of most prestigious universities was developed over one to two centuries, the University of South Florida has built a dynamic, national reputation in less than 50 years. Founded in 1956, USF now serves more than 47,000 students annually, including students from every state and more than one hundred foreign countries.

The University ranks in the top national classification of the prestigious Carnegie Foundation for its excellence in research. USF's world-renowned researchers, specializing in fields such as oceanography, genetics, neurology, aging and public health, alternative fuel polymers, and advanced materials, generate more than \$200 million annually in sponsored research contracts and grants. USF's affiliations with area hospitals, including Tampa General and All Children's in St. Petersburg, plus two located on campus -- H. Lee Moffitt Cancer Center and Shriners Children's Hospital -- make it the center of the region's medical, biotechnology and bioscience research.

Located in the thriving Tampa Bay metropolitan area, USF has campuses in Tampa, St. Petersburg, Sarasota-Manatee and Lakeland, as well as centers in downtown Tampa, New Port Richey and northern Pinellas County. Over two hundred degree programs are offered with degrees conferred at all levels, including MD.

The above information provides but a brief introduction to the USF story. For more on USF, its campuses; its programs and its community, visit our web-site at <http://www.usf.edu>.

Statement of the Problem/Initiative

The Data Administration and Reporting Team (DART) is an organizational unit within the Office of Budget & Policy Analysis. DART faces the daily challenge of providing relevant accurate, and useful management information to a variety of internal and external clients, including top-level USF management, regional campus Deans, college Deans, and department chairs. Historically, these responsibilities were handled by as many as seven employees who programmed and maintained reports, processed ad hoc requests, prepared summaries, ran reports, printed, sorted, copied, collated, and distributed these data to every college, campus, department, and external agency that requested the information. At its busiest, at any one of twelve reporting benchmarks in an academic year, three to four employees spent three to four days running reports and preparing spreadsheets for the many clients that regularly expected them.

At a time when more people wanted more data more quickly, the USF culture was transitioning its core business technologies. As a result, due to the new system implementations, fewer resources were available for data production. The **USF InfoMart** was developed as an answer to the manual, time consuming, labor-intensive method of data production and distribution that existed.

The **USF InfoMart** is an organized collection of interactive database driven web applications that provide point-and-click access to more than five years worth of information about a wide spectrum of University resources, including students, courses, degrees, employees, and more.

Design

DART developed the **USF InfoMart** (<http://www.usf.edu/usfirp/infomart/>) in-house, collecting data from the internal transactional systems, summarizing and storing this information in databases and displaying it on web pages. Programming tools and languages include SAS, SQL Server, HTML, Visual Studio, JavaScript, Visual Basic Script, and ActiveX Data Objects. The initial phase was designed and developed by two full-time employees off and on over a six-month time period. In addition, a third employee coordinated user input, marketing, and, eventually, training.

The **USF InfoMart** has two major components: the back end, where data are extracted, scrubbed, summarized, and stored, and the front end, a graphic user interface allowing end users to easily interact with this information.

For the backend, data are extracted from the enterprise server and student information system (Oracle) using SAS. These data are cleaned (for consistency and accuracy) and written to flat files, also using SAS. These files are then loaded into MS SQL Server. Stored procedures are written in SQL to load these data into the appropriate database tables. That way, data are pulled out into reports based on specific parameters and future maintenance is as point-and-click as possible.

The front end consists of web pages developed in MS Visual Studio. Using standard HTML and JavaScript, the user is presented with choices as to which type of data they would like to view. As the user specifies their specific criteria, VB Script and ActiveX Data Objects interact with the database to produce a custom report on demand. These reports are all written in basic HTML, resulting in easy access by anyone with a web browser.

The **USF InfoMart** has two major parts for access to University data, each with its own specific function. The main inner portion allows the user to navigate to applications that provide dynamic, detailed views of the following University data:

students: applied and/or accepted counts and yields, enrollment headcount, student demographics, degrees awarded, and unduplicated annual headcounts;

courses: section counts, average course sizes, generated student credit hours with full-time equivalency (FTE) conversions, and a derived course load matrix report that displays credit hours and instances of enrollment generated by courses within a department broken down by students from majors within that department and/or college or outside the college;

employees: counts and demographics of all staff and/or faculty by type and status, plus extensive faculty activity information; and

metadata: descriptions and values of data sources and crosswalks, showing the relationship between student units and course units and displaying the actual transactional system tables used as the report and data selection sources.

Data are organized by subject with mouse-over texts built into the interface to provide brief descriptions, helping users find what they need in an easy and intuitive manner. Data include current statistics as well as at least five years of history, all reflecting multiple point-in-time reporting benchmarks within the term that allow valid term-to-term and year-to-year comparisons. The application features include the user's capability to self-select only data of interest, by selecting from a series of pull-down boxes that identify time-period and level of detail desired. Data can be sorted and selected at the total university level, for only specific campuses within the university, by college, for selected departments within the college and for specific time periods, such as term or academic year. The user simply clicks on a Submit Query button and can then view, print, or download the data/report into a PC for re-formatting.

If users prefer, they can select pre-formatted reports and official publications via the **USF InfoMart** by accessing the second major part, the outer bar of the application's front page. One feature in the plethora of pre-formatted reports available via this electronic reporting application is a

virtual Academic Departmental Profile (<http://www.usf.edu/usfir/DeptProfiles/>). This profile provides one location for a department to access to find their current and historical statistics and demographics. The profile includes a five-year history of statistics specific to the department: enrollment headcount by major, credit hours generated via the courses offered by their department and who took those courses (i.e., majors, other majors in the college, majors outside the college, or non-degree seeking students), degrees awarded in their program, and numbers of staff and faculty. This feature is useful not only for internal management, but also provides data needed for the continual monitoring required by accreditation assessments and for the completion of survey or grant proposals.

Another feature in the application is an Undergraduate Retention Reporting System (<http://www.usf.edu/usfir/retention/>). Again, via a process of point-and-click, the user can find everything necessary to study the institution's graduation and retention rates, selecting any type of cohort or level of detail or summary of interest. Also, the application provides links to many of the University's official data publications, like the University Fact Book, the Common Data Set, performance measures, as well as Institutional Research abstracts and papers.

Implementation

When initially developing the **USF InfoMart**, DART had the good fortune to start with a nearly complete set of management information reports (though they were in hard-copy and often hundreds, if not thousands, of pages long). In order to put the **USF InfoMart** into production, space on USF's production web server was required, as well as a dedicated database instance within SQL Server. Once in production, a process for maintaining the database and easily updating it as new data became available was developed.

Once the **USF InfoMart** was developed, DART then had to instigate a cultural transition on the part of the user to use the web-based tool versus the more-familiar use of a hard-copy report. Training sessions were developed and successfully received. We found users hungry for information available for display at their fingertips! We provided hands-on training in small groups in the user's own environment. This provided the opportunity for user feedback, eventually leading to some redesign and the addition of some new segments to the application.

In addition, we incorporated another tool within the **USF InfoMart** by adding a section called "iTraining" (<http://usfweb.usf.edu/usfirp/iTraining>). iTraining includes a comprehensive documentation section that describes all parts of the application and explains all the reports and report options available as well as the methodologies used in the reporting process. It houses a step-by-step tutorial to introduce new users to the application. Additional features include usage statistics that reveal which part of the application receive the number of "hits" recorded and a process for user questions and feedback on the application's usefulness.

Benefits

The University of South Florida is a large, multi-campus, metropolitan institution. A plethora of accurate and useful management information must be available to top management at a variety of levels and locations in a timely manner. The development of the InfoMart application addressed USF's needs for enhanced data availability and access and, in the process, reduced the time, manpower and resources required to produce and maintain information and reports. The **USF InfoMart** provides a central, easily accessible source for official numbers for all University resources. And, the information in the **USF InfoMart** is there to use, not just to view! Within the iTraining section, step-by-step instructions show the user how to download selected reports into the PC (<http://usfweb.usf.edu/usfirp/iTraining/directions.htm>) . Because the application includes historical information, the user can cut and paste to prepare and graph historical trends and develop data projections.

Implementation of the system led to improved data integrity: as users began to look more closely at their own data, they were quick to report any discrepancies in the official data and their expectations. As users began to streamline their own reports, and because information is available to external constituents, ad hoc data requests have been significantly reduced.

Because the information is aggregated, there are no privacy or security issues. Data aggregation decisions, consistent with the institution's definitions and reporting methodologies, are already made for the user. By providing reports useful to all levels of management –from administrative offices to academic departments- shadow database systems were no longer necessary and all users are producing reports based on uniform collection and reporting methodologies. Data are openly available to anyone interested.

Retrospect

The **USF InfoMart** is a tool that is constantly evolving. Why didn't we do it sooner?

Technology was not available. The **USF InfoMart** was designed and developed to act as a University wide resource for the dissemination of information. It has grown to be a sophisticated tool, composed of many applications across several different subject areas. Use of the system requires only a computer with web access. We are constantly finding new ways to use the tool to enhance our reporting capabilities while streamlining effort and cost associated with those enhancements.