

KSU'S SAS Initiative in Enterprise Information Management

Two Key Performance Objectives for Information Management and Technology

Information management and technology at KSU are expected to add value at two critical levels of performance:

Level 1 Performance. Support efficient automation of essential routine operations such as employment and payroll processing, financial accounting, student admissions, course registration, financial aid management and related Web-based transactions (i.e., support operational database “applications”) -- ESS leads

Level 2 Performance. Facilitate the establishment of accessible, accurate and reliable systems for information generation to support reporting, planning, decision-making, strategic management, and organizational effectiveness (i.e., support “information reporting and management,” “enterprise intelligence” and “analytics”) -- EIM leads

Only Routine Operations Are Served Reasonably Well by Current Packages

KSU's Banner and PeopleSoft systems are highly complex commercial software packages that focus primarily on Level 1 applications. They perform essential routine operations in student records, accounting, employment, and payroll reasonably well. Their vendors tout the capabilities of these systems to communicate with one another and serve as important Level 2 sources of decision-support information. However, those claims are not easily or routinely realized. The Banner and PeopleSoft systems are weak in support of enterprise intelligence and analytics. They are often negatively characterized as “data jails” because the data they capture are not easily accessed, edited, extracted, transformed, analyzed, or reported and are often neither standardized nor “clean.” Queries are cumbersome, complex, and require technical intervention. KSU's considerable efforts over the past five years to use those systems for the creation of a data warehouse, data marts, operational and analytical reports and enterprise intelligence have yielded disappointing results. KSU's CIO and EIM professionals have concluded that although Banner and PeopleSoft applications add value for routine university operations at Level 1, practical and cost-effective solutions for responding to the university's demands for data integrity, data integration, enterprise intelligence and analytics at Level 2 are not likely to evolve from those particular database systems and tools.

KSU's SAS Initiative for Enterprise Intelligence and Analytics

KSU's SAS Initiative aims to establish a practical and cost-effective alternative to meeting institutional demands for enterprise intelligence and self-service analytics at Level 2. In 2007, EIM acquired and installed the core components of the SAS Enterprise Intelligence Suite for Education (EISE). EISE is not a package that performs Level 1 operations. Instead, it is an enterprise data warehousing and intelligence platform that is designed primarily to address Level 2 interests. The EISE platform overlays and interfaces with diverse application platforms, silo operations, and niche software tools such as our existing Banner and PeopleSoft applications. It integrates and stores enterprise data in a unified metadata repository that reinforces data integrity and efficiently disseminates descriptive and predictive decision-support analyses through dashboards and self-service ad hoc reports to the desktops of end-users with little or no technical jargon or programming. The SAS BI platform is a recognized industry leader in business intelligence and analytics. Other early adopters in higher education of the EISE platform include the University of Central Florida, University of Kansas, the Virginia Community College System, Broward Community College in Florida, and Slippery Rock University. Most of those institutions have integrated EISE with their existing PeopleSoft applications. KSU's EIM team is presently in the process of integrating EISE with the existing Banner database. Future acquisition of the Financial Management and Human Capital Management modules would facilitate integration of the PeopleSoft databases (or their successors) with KSU's enterprise data warehouse. Even without the SAS FM and HCM modules, the present EISE platform can be utilized to provide self-service data extraction and reporting functions from KSU's existing operational databases without the necessity of technical programming at the user level. KSU's SAS Initiative has substantial potential to address successfully the institution's Level 2 needs and could produce a proof of concept and scalable prototype for addressing Level 2 interests throughout the University System of Georgia.

First Year's Progress on the SAS Initiative

April 2008

Accepting the Charge to Lead the SAS Initiative

In April 2007, Enterprise Information Management accepted the COO/CIO's charge to take a leadership role in coordinating KSU's SAS Initiative. That assignment is a good fit for EIM because the project's expected yield of IM capabilities are inextricably linked to the performance of our unit's fundamental mission and assigned responsibilities for enterprise reporting and master data management. EIM is the assigned keyholder with responsibility for many of KSU's federal, national, regional, state and local reporting tasks. EIM is also the publisher of KSU's Fact Book and manages the Virtual Information Center. EIM is a major functional user of the enterprise intelligence, information management, and data warehousing/mart systems at KSU's disposal, all of which should be strengthened and expanded significantly to better serve the interests of the entire university and its members.

Acquisition of the SAS Enterprise Intelligence Suite for Education (EISE)

The COO/CIO authorized EIM to acquire the EISE platform and related SAS tools including Web Reports Studio, Enterprise Guide, and Enterprise Miner near the end of FY 2007. Those packages were subsequently installed on an EIM test server by the end of Summer 2007. Four new dedicated servers were also purchased at year-end to support production use of the EISE platform. The migration of EISE, the metadata maps for student/academic information, and SAS-powered Portal equivalent reports to those production servers is expected to be completed in May 2008.

At the COO/CIO's request in April 2008, EIM secured quotes from SAS and Dell for the Phase II software and hardware expansion of the Enterprise Intelligence Suite to accommodate data warehouse construction and data integration across KSU's operational databases for student/academic information, financial information, and human resources information. If funds become available soon for Phase II expansion, the earliest that the additional servers and SAS data warehouse software would be installed would be sometime in Fall Semester 2008. Metadata mapping and data integration would require an additional nine to twelve months of technical effort before a unified data warehouse becomes operational.

Phase I Milestones and Developments

Throughout Fall 2007 and into Spring 2008, six members of the EIM team participated in a variety of SAS training courses on the Enterprise Intelligence platform and related tool sets. They became KSU's initial core group of SAS Intelligence Specialists and resident SAS experts. The EIM team began training an alpha group of Banner power users in SAS Web Reports Studio in March 2008. That alpha group will constitute the first wave of KSU's unit-based SAS Intelligence Specialists. Roles and responsibilities of SAS Intelligence Specialists are outlined in the document, Developmental Phases of KSU's SAS Initiative.

Throughout Fall 2007, Erik Bowe, EIM's Director of Data Management and Information Architect and his team constructed the metadata map for defining, importing, and integrating Banner operational data into KSU's SAS Enterprise Intelligence system. Metadata mapping for financial and human resource information has not been initiated yet, but will be a necessary next step for a fully integrated SAS-powered information management system and data warehouse.

Throughout Fall 2007, SQL codes for over 650 current routine Oracle Portal reports involving Banner data were analyzed by EIM staff. Once reporting redundancies were eliminated through consolidations, the roughly 75 remaining reports were successfully converted for production from the SAS platform. Regression testing of those reports is underway and is expected to be completed at the end of April 2008. A beta group of Portal users will critically review the quality and usefulness of those reports in May 2008 before they are made widely available on the new SAS production servers. These SAS-powered reports are expected to replace their Oracle Portal counterparts.

Kim West and Erik Bowe formed an academic Data Integrity Review Team (DIRT) to facilitate the identification and elimination of dirty data in the Banner operational database. The work of that group in 2007-2008 significantly accelerated KSU's readiness for submission of data to the USG's Academic Data Mart in Spring 2008. Since then, use of the SAS Web Reports Studio by DIRT members has also led to notable self-initiated efforts to cleanse dirty data from the Banner database. Ideally, the data warehouse will store cleansed rather than dirty data.

The alpha group of Banner power users began testing the self-service features of SAS Web Reports Studio for satisfying their ad hoc needs for information in the Banner database beginning in March 2008. Self-service report generation in SAS eliminates the need for SQL coding or sophisticated knowledge of database tables or elements. Alpha group users of the SAS Intelligence system have typically been amazed by the speed and ease of access to "jailed" data and the flexibility they have to generate and change customized reports.

EIM and Enterprise Intelligence Are Cutting Edge Developments

EIM's Executive Director, Ed Rugg, attended the annual DAMA conference of data management professionals in the spring and learned that higher education is trailing industry and government in adoption of master data management and data integrity principles, metadata development initiatives, data governance and data stewardship practices, and database integration across silo operations to support enterprise intelligence capabilities. Admittedly, those terms and concepts are typically absent in IT and IM conversations throughout the USG. It was interesting to note, however, that the term, "Enterprise Information Management," was being touted as a new strategic direction in the field of information management. In DAMA's recent Summer EIM Conference announcement, the term was defined as "a comprehensive strategy for integrating the entirety of an organization's data...it is the emerging solution to the problems of information silos, disparate data resources, and un-integrated applications." KSU's SAS Initiative is apparently on the cutting edge of a new strategic direction in information management. Thank you Dr. Hinds for spearheading a visionary SAS Initiative!

Developmental Phases of KSU's SAS Initiative

Phase I: Operational Database Access (Liberating Jailed Operational Data)

Expected Outcome: Administrative units will have Level 2 self-service access to, report generation capabilities from and customized analytics for their operational databases on a routine and ad hoc basis from their desktops with little or no technical programming required

Required Prerequisite Tasks:

- **Administrative divisions/units (academic, student services, financial and human resources units initially) elect to partner with EIM by identifying their key personnel who will become the initial SAS Intelligence Specialists for their divisions/units with a charge to provide Level 2 support for facilitating and proliferating self-service database reporting and data management within their divisions/units**
- **EIM's Director of Data Management and KSU's SAS Intelligence Architect (Erik Bowe) trains and coordinates (through an ongoing recognized dotted line relationship) the initial collaborative network of SAS Intelligence Specialists who subsequently support and train their colleagues in the use of SAS Web Reports Studio for self-service database reporting and data management in their units**
- **EIM's SAS Intelligence Architect consults with the pertinent SAS Intelligence Specialists to create the enterprise metadata maps for SAS integration of the critical data elements that presently reside in KSU's operational database silos and ERP systems**
- **In consultation with each unit's SAS Intelligence Specialists, EIM's SAS Intelligence Team configure customized SAS data element cubes (critical data element repositories for each unit) for self-service access and reporting by the units' members using SAS Web Reports Studio**
- **In consultation with the pertinent SAS Intelligence Specialists, EIM's SAS Intelligence Team streamlines and converts existing routine operational database reports produced through Oracle Portal/SQL into routine reports generated through SAS Web Reports Studio which are also accessible at the desktop on a self-service basis**
- **Each unit's SAS Intelligence Specialists take the lead, with the advice of EIM's SAS Intelligence Team as needed, for the development of customized analytics and management dashboards for their self-service reporting functions**

- Each unit relies primarily on its SAS Intelligence Specialists to manage and facilitate their unit's self-service generation of routine and ad hoc reports, database cleansing, data systems coordination, and intelligence troubleshooting, consulting EIM's Director of Enterprise Information Reporting (Donna Hutcheson) and other SAS Intelligence Team members for assistance as needed

Phase II: Data Warehouse/Mart Access (Storing and Retrieving Census Data)

Expected Outcome: EIM will take the lead in coordinating and establishing a unified and integrated enterprise data warehouse/marts structure for KSU that stores historical, cleansed, official, census data for Level 2 enterprise and unit self-service data retrieval, reporting and analytics in support of planning, decision-making, assessment and improvement

Required Prerequisite Tasks:

- KSU adopts Data Governance Standards that incorporate good practices of data stewardship of the enterprise's information assets
- EIM's SAS Intelligence Architect/Team in collaboration with the units' Database Stewards and SAS Intelligence Specialists design, construct and populate KSU's Data Warehouse/Marts in compliance with KSU's enterprise data integrity/governance standards
- EIM coordinates with KSU's Database Stewards and SAS Intelligence Specialists implementation of enterprise data governance and master data management standards for census data capture and cleansing before storing official/authoritative enterprise information in KSU's Data Warehouse/Marts
- KSU's Data Warehouse/Marts are designed to have similar self-service access, reporting, and analytics capabilities to those which are available through the SAS Intelligence platform at the enterprise and unit levels from the operational databases
- The SAS FM and HCM modules will be purchased to facilitate the construction and maintenance of a sound and integrated enterprise data warehouse/mart repository
- The units' Database Stewards and SAS Intelligence Specialists will be key advocates and catalysts for developing and maintaining the integrity and usefulness of KSU's enterprise data warehouse/marts