

## **SAIS: Technology Solutions = Dollars and Sense**

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## **Abstract**

*The Florida State University Offices of Operations Analysis and Sponsored Research Accounting Services collaborated in the development and implementation of an automated invoicing system to produce invoices for state contract and grant awards. The goal was to replace a manual, labor-intensive invoicing process with an automated, resource-efficient system.*

*The Sponsored Research Accounting Services Automated Invoicing System (SAIS) was developed in Microsoft Access. It was implemented in April 2003 and is designed to:*

- *provide an active awards database of state contracts and grants*
- *produce cost reimbursement, fixed price deliverable, and fixed price percentage invoices for monthly and quarterly billings*
- *reduce redundancy and manual input*
- *use downloads of financial and directory data (names, addresses, etc.) from outside systems wherever feasible*
- *reduce resources required to produce and review invoices*
- *ensure completeness, consistency, accuracy and timeliness*
- *strengthen internal controls, productivity, earnings and efficiencies*
- *provide management tools to plan, monitor and measure work, and have real-time information for decision making.*

*SAIS is currently up, running and managed by the Office of Sponsored Research. As of September 30, the SAIS database is comprised of over 474 state grants and contracts representing over \$106 million in awards.*

*The turnaround time for monthly invoicing has been reduced from up to three weeks to one or two days. For example, in August 2003, the SAIS invoice schedule identified 231 accounts that needed to be invoiced. Three staff processed 133 invoices in less than 12 working hours, i.e., the first day and a half of the monthly invoicing cycle. At the same time staff sent 41 account-specific emails to departments to obtain project status on fixed price awards; reviewed 22 accounts and determined that no invoice was appropriate (e.g., no current month expenditures); and reviewed another 13 accounts and determined that additional documentation was needed before an invoice could be processed. In summary, three staff invoiced, emailed for status, or reviewed for action over 90% of the accounts in a day and a half. Similar results were achieved for the last quarterly invoicing cycle (June 30, 2003) for which 320 accounts were identified for invoicing.*

*The Office of Operations Analysis estimates that the new system will result in annual savings in excess of \$124,000, and will allow management to reallocate human and dollar resources to other priorities.*

## **Introduction of the Organization**

Florida State University, founded in 1851, is located in Florida's capital city of Tallahassee. The main campus rests on 486 rolling acres surrounded by North Florida's moss-draped live oak trees.

Florida State University (FSU) is respected for its breadth of excellence in both its programs and facilities. Its alumni are renowned and diverse in their accomplishments, from esteemed scientists to accomplished artists. FSU's faculty and facilities encompass Nobel Laureates and astronauts, museums and a medical college; historical architecture and cutting edge research and technology.

As a celebrated research university, Florida State University is one of the top ten universities in royalties generated from scientific research and discoveries. In addition, it is home to the world's largest magnet at the [National High Magnetic Field Laboratory](#), one of only five high field laboratories in the world.

FSU's tradition not only includes academic excellence, but also boasts a long-standing practice of promoting racial, ethnic and socioeconomic diversity. On its numerous campus locations in-state and abroad, minority students from the United States and around the world represent almost 25% of FSU's 36,000 student population.

## **Statement of the Problem/Initiative**

Four staff in the FSU Office of Sponsored Research Accounting Services Office (SRAS) have direct responsibility for the post-award maintenance of 474 active state contracts and grants representing \$106 million in total awards. Approximately 90% of these awards require that SRAS invoice various agencies monthly, quarterly or annually to recover expenditures on a cost reimbursable or fixed cost basis.

The process of managing state contracts and grants at the post-award level includes the set-up of new awards; retaining hard copy files; scheduling of invoicing; producing and mailing monthly, quarterly and annual invoices; recording receivables; recording cash collections; recording award time and dollar modifications; processing of personnel action forms; communication and coordination with the departments; and the ongoing financial management of awards.

Prior to automation, monthly invoice schedules were compiled from reviewing individual accounts each month. The invoice forms were maintained on individual Microsoft Excel spreadsheets. To complete the spreadsheets, staff had to research electronic data and paper award files, then transfer and compile data from the various external sources. All of these activities were substantially manual processes, requiring time-consuming and redundant data entry. There was no historical information available except in hard copy, and no back-up documentation for hard copy summaries. The sheer number of awards, combined with detailed and repetitive manual processes, created a work environment that was tedious, wrought with errors, and professionally unrewarding.

Florida State University is currently undergoing a multi-year implementation of a new system using Peoplesoft that will integrate the University's financial, human resource and student services systems. The Peoplesoft system will include automation of the invoicing process for federal contracts and grants, but it has not been determined whether state contracts and grants will be included in the functionality in the first implementation phase. Based on the long range implementation date of the new system, and the growing numbers of awards that must be administered, the Offices of Operations Analysis (OA) and SRAS undertook the development and implementation of a solution to automate the state invoicing process. The solution, the Sponsored Research Accounting Services Automated Invoicing System (SAIS), was designed and implemented to reduce workload while at the same time increase accuracy, efficiency and accountability in the financial management of FSU's contracts and grants. In addition, SAIS will be interfaced with the new Peoplesoft system in the event that functionality for state contract and grant invoicing is not included in the first phase of software implementation.

## **Design**

### **Purpose**

The purpose of SAIS is to provide a cost-effective and resource efficient method of maintaining an active awards database of state contracts and grants that efficiently produces cost-reimbursement, fixed price deliverable, and fixed price percentage invoices on monthly, quarterly, and annual schedules.

## **Resources**

Given the limited availability of additional resources, the decision was made to use existing resources, including both staffing and software, in the development of a solution for state invoicing. Staffing for the design and development phase of SAIS included the Director of Operations Analysis (who at the time was assigned to oversee SRAS operations on an interim basis), the SRAS Access Programmer, and an SRAS employee who was identified as a Model User based on her extensive knowledge and experience with the invoicing process. The SAIS implementation team incorporated the system design, development and implementation tasks into their daily work responsibilities at no additional cost to the University.

Microsoft Access was selected for the application software. It was already available to and being used by SRAS staff for other purposes and the SRAS Programmer was highly skilled in its use. With the exception of using the state invoicing staff for developing the SAIS database and inputting data into the system during the implementation phase, there were no additional staffing, equipment or technology resources needed or used.

## **Methodology**

The new system, SAIS, is designed to utilize current technology to accomplish the following:

- automate the entire state invoicing process
- ensure completeness, consistency, accuracy and timeliness of invoices
- eliminate errors and redundancy

- utilize downloads of information from other systems wherever feasible
- significantly reduce resources required to produce invoices
- reduce supervisory time to monitor and review invoicing process
- provide management with tools to plan, monitor, and evaluate operations.

To achieve the above, SAIS includes:

- **Billing Sheets** for each award that reflect detailed contract and grant information including contacts, award amounts, award period, compliance, forfeiture dates, billing cycle info, etc.
- **Active Awards Database** of all state contracts and grants populated from Billing Sheets input by accountants.
- **Invoice Schedule** reflecting all budget numbers by EO, invoice due date, and type of invoice due for the particular invoice period (monthly, quarterly, etc.). The Invoice Schedule automatically updates as invoices are completed, and is linked to other reports and functions.
- **Automated e-mails** that notify departments of deliverables due on fixed price projects; and notify departments in advance of closing projects including downloaded expenditure data, and fixed asset reporting forms to departments.
- **Standard FSU invoices and envelopes** for Cost Reimbursement, Fixed Price Deliverable, and Fixed Price Percentage state contracts and grants for monthly, quarterly and final invoices.
- **Reports** for accountants and management to monitor work flow, measure performance, identify exceptions and track information.

- **Automatic download** of data from the University financial system and indirect costs from the Indirect Cost File system.
- **Storage and back-up** system that provides a historical trail of all state invoices and processing.

### **Invoices**

SAIS produces standard FSU format invoices for cost reimbursement, and fixed price deliverable and percentage awards based on the Invoice Schedule. Current and cumulative amounts recorded in the University financial system are downloaded for all expenditure object codes directly into the SAIS standard invoice format. Indirect costs are automatically downloaded from the Indirect Cost file (maintained by SRAS Treasury Management). Total revenue is downloaded from the University financial system and shown in the summary history of transactions on the invoice. All totals on the invoices are automatically calculated. As a result, manual preparation of previously required expenditure and cash reconciliations and expense summaries in Excel are no longer necessary.

SAIS automatically updates the Invoice Schedule reflecting invoices completed by date and invoice number for management review. In addition, various management reports are automatically created in SAIS to provide tools to monitor and measure the invoice process and support decision making. The invoicing process and related reports are “real-time”; management can easily monitor progress on an up-to-the-minute basis.

## **Closing Awards**

SAIS automatically identifies awards and their related budgets that are closing in the current invoicing period, and provides a function for accountants to send e-mails to departments prior to the project end date. The e-mail notifies the department that the project is closing; contains automatic downloads of financial data on project budget and expenditures; and notifies the department that encumbrances and expenditures must be finalized by the month end before the forfeiture date. At the month end before the forfeiture date stated in the contract, SAIS produces a final invoice and automatically updates information in the Invoice Schedule.

It is important to note that SAIS reflects all expenditures on the final invoice through the month end before the forfeiture date. This process, along with the early e-mail notification to departments, eliminates the need for accountants to run manual expenditure reports separately to calculate total final costs to be invoiced. SAIS automatically downloads the information through the month end before the forfeiture date, saving time and reducing errors.

## **SAIS Accounts Receivable and Receipts**

When the invoicing process is complete, Accounts Receivable staff accesses the Invoice Statistics Report which provides the information necessary to record receivables.

Accounts Receivable staff manually inputs the information into the Accounts Receivable system. The future intent is to interface the Accounts Receivable system with SAIS, or rely on an interface available in the new Peoplesoft system.

As monies are received, the Accounts Receivable staff enters the receipt information into SAIS. This function provides a historical record of all monies received, partial and full, for each invoice on each award. In addition, a Receipts Report is available in SAIS that provides up-to-date details of all invoices and receipts by date for the award.

Accountants are no longer required to make two copies of each invoice for Accounts Receivable staff since this information is available electronically in SAIS. Accountants and Accounts Receivable staff are also no longer required to produce manual receipt forms or maintain manual logs in files.

### **SAIS Management Reports**

A variety of reports have been designed in SAIS to allow accountants to monitor their work and identify errors and omissions, and to provide management with tools to monitor, measure, and have current information for decision-making. The reports are real-time and can be utilized throughout the monthly billing process. SAIS reports currently include:

- **Invoice Schedule** details all budget numbers for awards that require invoicing for a specified time period. The Schedule automatically tracks the sending of e-mails for FPD, FPP and final invoices. In addition, it provides specific information on invoices such as date prepared, invoice number, and comments.

- **Active Awards Report** details all awards reflected in the SAIS database and provides totals of the number of awards and total dollar amounts of awards. Information enables management to monitor growth, evaluate resource requirements, and have reporting mechanisms available on a monthly basis.
- **Invoice Statistics Report** details the number of invoices produced (sorted by assigned accountant and bill type) reflecting total dollar amount invoiced and total number of invoices produced in a billing period. This information provides data to measure performance and make decisions regarding staffing, division of workload, strategic planning, etc.
- **Active Awards Not Scheduled** details budget numbers reflected in the awards database that do not appear on current Invoice Schedule. Allows management and accountants to review information for any errors to ensure completeness of billing cycle.
- **Scheduled Awards Not Invoiced** details awards that appear on the current period Invoice Schedule (invoice due in current period) but have not had an invoice produced in the current period. Allows management and accountants to track invoicing not completed on the Invoice Schedule for reasons such as lack of response on deliverables, etc.

- **Budget Exceptions Report** details expenses that exceed budgeted line items as outlined in the contract. The accountant's version details exceptions by object code; management's version details exceptions at the account level. This report enables management to instruct accountants to investigate exceptions and to make corrections where necessary.
- **Incomplete Billing Sheets Report** details specific information that is required for invoicing that is missing on the Billing Sheet. Enables accountants and management to evaluate the completeness and accuracy of the database that drives SAIS.
- **Assigned Accountant Report** details which accountant is assigned to specific awards for invoicing and responsibilities related to monitoring and maintaining the awards. Enables management to evaluate workload and work assignments.
- **Budget Numbers in SAIS Not in Pre-Award** identifies awards that are in the SAIS database but do not appear in the Pre-Award database. Allows accountants and management to ensure consistency between the two databases for complete and accurate billing.

## **Implementation**

### **Timeline**

The tasks and timeframes for the design, development and implementation of SAIS were as follows:

- August – October 2002. SAIS Design and development. The OA Director and SRAS Programmer met with SRAS invoicing staff and conducted an extensive review of the overall requirements needed for the automated system. This included identification of all manual processes and data sources currently used. From the review, the scope of the project was defined and the system was subsequently designed to address all needed functionality.
- November 2002 – January 2003. Three Pilot Tests were conducted. During each pilot, the implementation team identified weaknesses, areas needing improvement, and additional areas needing research and analysis. Each pilot included testing of the modifications that resulted from the previous pilot, as well as additional functions and refinements resulting from continued analysis of SAIS by the implementation team. During the third pilot, the implementation team also tested SAIS functions for creating a new account; producing the Invoice Schedule, various management reports, final invoices, and envelopes for mailing invoices; sending e-mails to departments to inquire regarding deliverables due and percentages complete as well as e-mails for projects that were ending. In addition, an invoicing period was simulated to download information from University accounting systems for monthly, quarterly and annual invoices, and from the Indirect Cost System file. All were tested for accuracy.
- February 2003. Billing sheet data for 482 active awards was scrubbed and input into SAIS by the SRAS state team to initially populate the database. Billing sheet data

included a host of data elements such as grant coding, budget numbers, cost sharing, state revenue coding, funding agency and FSU contact information, invoice schedule, type of invoice (cost reimbursement or fixed price), forfeiture dates, etc.

- March 2003. Final testing was performed in March 2003 by running SAIS parallel with manual processing for February 2003 invoices. The Team compared all manual invoices to invoices produced in SAIS to ensure accuracy and consistency. Minor problems were identified and additional data was scrubbed to pave the way for full SAIS implementation. In addition, a full day, hands-on User Training session was conducted and participants were provided detailed Training Manuals.
- April 2003. SAIS became fully operational. The March 2003 monthly, quarterly and annual invoices (produced in April) were created in SAIS only.

### **Pitfalls/Issues**

Several unanticipated challenges surfaced during the implementation phase of SAIS. The first challenge was the population of the SAIS data base. Staff had originally intended to download the Pre-Award database for basic population of the SAIS database, but this proved unworkable. The implementation team instead had to build the SAIS database from scratch, which included the data entry of approximately 30 fields related to billing for each of 482 active accounts. Since staff had not yet “seen” the database it required that some basic pre-training be given to staff. In addition, using the hard copy files for source data, although necessary, was very cumbersome. Many of the accounts were

maintained in multiple volumes of file folders, and the contents varied in terms of completeness and accuracy. The implementation team had to run numerous ad hoc reports to identify inconsistencies, and staff had to scrub much data to ensure accuracy. As a result, population of the database took approximately one month longer than anticipated. On the positive side, some of the ad hoc reports run for initial data entry proved to be very useful and were subsequently turned into “stock” reports for ongoing identification and correction of data entry errors and omissions.

Unique format invoices required by State agencies (other than FSU standard invoice) still requires preparation of the invoice in Excel, outside of SAIS. All award data is maintained in SAIS, however, the unique format is not available in SAIS. This should be resolved by July 1, 2004, by development of the unique format in SAIS, or through interface with the new Peoplesoft system.

Another area that continues to create challenges is the interfacing of SAIS with Account Receivables. Currently, Accounts Receivable is maintained in SAIS and in a separate Accounts Receivable system. The goal is to either interface the current Accounts Receivable system with SAIS, or to interface SAIS into the new Peoplesoft system in its Accounts Receivable module. Until then, Accounts Receivable remains a duplicative process.

Finally, an ongoing challenge is ensuring that staff works only within the system; in other words, not making adjustments outside the system. Despite organized hands-on training

sessions, and involving staff in problem-solving sessions that demonstrate that the system is working efficiently and accurately, some staff continue to feel more comfortable with the old paper processes. With ongoing training and communication, the complete transition in thinking should be accomplished over time.

## **Benefits**

### **Use of Staff Resources**

The SAIS monthly and quarterly invoice process is straight-forward and fast. The benefit of the automated system in comparison to the manual process is summarized below in terms of resources used.

- Download of University systems financial information and Indirect Cost data file is performed by the 7<sup>th</sup> day of the month.

**SAIS: 7 - 10 minutes**

**Manual: not available**

- Run Invoice Schedule.

**SAIS: 2 - 3 minutes**

**Manual: 1 – 2 days**

- Accountants send e-mails on closing projects. The e-mails advise the department that the project is closing; provide timeframes for resolving encumbrances; and provide a form to transfer fixed assets, if any. The e-mail contains downloaded encumbrance and expenditure data, deliverables due, and percentage completed as appropriate.

**SAIS: 2 - 3 hours**

**Manual: 4 – 5 hours**

- Accountants begin processing invoices and printing envelopes for all invoices due.

**SAIS: 1 – 2 days**

**Manual: 2 – 3 weeks**

- Invoice Schedule is updated for all completed invoice information, e-mails sent, and comments entered on report

**SAIS: 0 - done automatically**

**Manual: 6 – 8 hours**

- Accounts Receivable information for all invoices given to AR staff.

**SAIS: 2 – 3 minutes to run Invoice Statistics Report**

**Manual: 2 – 3 hours hard copy per invoice**

- Management reports are produced, evaluated and summarized at the end of the process and presented to the Director.

**SAIS: 1 – 3 hours**

**Manual: Not available**

As a result of the above savings in resources, the challenge for the future is for management to effectively reallocate resources based on strategic planning goals and objectives.

### **Cost Benefit**

The cost of designing and implementing SAIS is offset and exceeded by immediate and long-term savings in operational costs. The estimated net benefit in excess of costs for

SAIS was calculated at \$88,562 in year one, and \$124,012 annual savings for each subsequent year.

The net benefit in excess of costs in year one translates to a payback period of less than one year. The first year design and implementation costs were approximately \$35,450 compared to the first year estimated benefit of \$124,012.

Savings are a result of reduced labor and time requirements, accompanied by increased interest earnings due to timelier invoicing and collection.

### **Ready for Peoplesoft**

The implementation of SAIS has had other benefits in addition to enormous savings in resources. With the upcoming transition to Peoplesoft, SRAS staff will be ahead of the learning curve. SRAS staff will already be familiar with an automated environment (SAIS) with similar functionalities, and will already have undergone the transition from dependency on labor intensive, manual processes to dependency on automated processes.

### **Retrospect**

SAIS dramatically changes the way the SRAS State Team works. Other than delays in waiting for responses to e-mails sent to departments for FPD and FPP invoices (to determine deliverables and/or percentages completed for the invoicing period) and time required to create unique invoice formats, the automated invoicing process takes no longer than 1 to 2 days. In comparison, the previous invoicing process consumed 2 to 3

weeks of staff time. Effort spent on producing invoices and maintaining award data is significantly reduced, while accuracy and consistency are vastly improved. The savings in time allows SRAS management to redirect resources to customer service and other assignments that forward the mission of SRAS, and offers staff a challenging and rewarding work environment.

SAIS has proven itself to be an efficient and cost effective system for invoice processing. The Director now has real-time information available to effectively manage the allocation of work and will be able to redirect resources where needed. The Office of Operations Analysis continues to provide ongoing monitoring of the system and support to the SRAS team.