

GETTING STARTED WITH EIS USING SAS/AF SOFTWARE

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Introduction & Business Background

This paper discusses the process Gulfstream (GAC) went through to develop Executive Information Systems (EIS) using SAS/AF software. It explains how they got started with EIS, why SAS was chosen as opposed to other EIS software, where they are now, and where they plan to go from here.

Gulfstream Aerospace Corporation is the world's leading manufacturer of corporate executive aircraft with approximately 3500 employees. Its primary product is the Gulfstream executive jet which is built in its manufacturing facility in Savannah, Georgia. The current production plane is the G-IV which is considered the "Rolls Royce" of corporate jets. They are currently developing a new G-V aircraft which is scheduled to be delivered beginning in 1996. GAC also has a major post-production business which includes two completion center and service center facilities (located in Savannah, Georgia and Long Beach, California) as well as a detailed parts manufacturing facility in Bethany, Oklahoma.

Gulfstream's mainframe data processing environment includes:

- One IBM 9000/740 running MVS/ESA
- Many IDMS and CICS/VSAM applications
- SAS/AF applications
- MVS/Officevision for E-Mail

SAS is used at GAC as an end-user computing tool as well as a tool for application development. We are currently running version 6.07 of SAS and recently migrated our version 5.18 AF applications to release 6.07.

What is an EIS?

An EIS is an Executive Information System. This is generally known as a computer-based tool which supports senior management. The "executive" has been known to be any person responsible for setting policy on or executing a critical organization mission.

In recent years, EIS's are being distributed to many other users below the executive levels. EIS is becoming known as "Everybody's Information System."

An EIS should provide quick answers to executive queries in the most useful format for the executive. This format may be textual or graphics. The EIS should also help support communication with other executives and/or staff. The EIS should reinforce goals and priorities of the business and the executive.

The EIS may not necessarily be an online system. Some are delivered on paper. It should be done using the most effective mode of delivering the critical information needed to the executive in order to help him do his job best.

To help insure that the EIS survives, the following points are important:

- Focus on Critical Success Projects or projects which will solve or monitor a particular business problem.
- Have a senior executive as the EIS sponsor
- User commitment to help define requirements throughout the project
- EIS development staff with business and technical skills
- Highly knowledgeable business professionals as users
- Market EIS successes throughout the company

Getting Started with EIS at GAC

SAS was brought into GAC in 1987 primarily as an end-user computing product to be used for reporting, statistical analysis, mainframe graphics, etc. Most of the various SAS modules were acquired at that time.

IS had a request from manufacturing to create graphs

to be plotted or viewed online related to hours to produce the aircraft. There were various detailed graphs by station as well as summary graphs by department, area manager, and total manufacturing. The graphs were line plots showing target vs. actual hours. Eventually, some customized graphs were created including a graph showing a schedule of when an aircraft will get its FAA Certificate of Airworthiness and other graphs showing progress of the major assemblies on current aircraft going through the production line.

These graphs became our first SAS/AF application. The application was pretty much thrown together quickly for viewing by manufacturing personnel. When the Vice President of Manufacturing (hereinafter referred to as VP-MFG) found out about the application, he expressed interest in gaining access to the information. This was the first time any executive at GAC had expressed interest in using a computer. At this point, I was brought into the project to make sure the application was very user friendly and easy to use since a vice president was going to be using it.

After several weeks of fine tuning the application to make it user friendly, we were ready to go. The VP-MFG was very happy with it from the start except for a couple of things - response time and the graph scaling. Response time is a very important factor in building an EIS. For the most part, our application had great, subsecond response time. We had set up a batch job to run at night on a regular basis to update the graphs which were placed in a graphics catalog. The entire application was PF key driven to make it easy to traverse screens. The one thing we did which impacted response time was at the beginning of the application. We created a custom graph which displayed a G-IV aircraft as the user was entering the AF application. This took four to five seconds to appear on the screen. The VP-MFG thought this plane was "cute" but not worth the added response time. He was anxious to get to the real data. This was a valuable lesson to learn right away for future EIS applications - response time is very important to the executive. We deleted the plane from the application.

The other problem related to graph scaling was a tricky one to fix. The VP-MFG did not like SAS's automatic scaling algorithm. He felt he had to think too hard when looking at certain graphs/scales to

calculate the hours. We ended up customizing the Y-axis scale based on the graph's maximum and minimum values. Over a period of weeks, we finally found an algorithm which satisfied him. In addition, we added grid lines across the Y-axis points to make it easier to figure out the numbers. This made us aware of another fact - executives don't want to have to think too hard when they're looking at the data. We need to make the system as simple as possible.

The VP-MFG had other requirements related to employee salary information, performance reviews, salary ranges, etc. We created an online system in TSO using clists and panels which allowed authorized executives to bring up salary and performance details for employees within their organization. They can search for an employee by department, first name, last name, or employee number. This has continued to be a very important application for them and has resulted in the elimination of several hardcopy reports.

The VP-MFG was very proud of "his" system and proceeded to talk about it to other executives, including the President of GAC at that time. The President was a 65 year old man who had never liked computers. Within a short time, he was ready to have a computer on his desk, too.

At this point, another requirement surfaced which was important to both of these executives - E-Mail. They were very anxious to start eliminating paper and to begin communicating electronically with their staff. At that time, we did not have anything implemented but were talking about implementing Personal Services from IBM. This project got pushed up in the priorities, and it wasn't long before E-Mail was being used by many users including the executives.

The President quickly realized what computers can do and began bragging to the other, lower level executives about his computer and the information he was getting. Soon, many other VP's and Directors started asking questions about the SAS application, E-Mail, etc. The President started saying that eventually everyone at GAC should have a computer on their desk. We began giving all interested executives graphics terminals and set them up for the SAS/AF application and E-Mail.

It became apparent that EIS had begun at GAC. The SAS/AF application was completed in 1988; and by

1989, many executives were using a computer for, minimally, E-Mail.

To Buy EIS Software or Not to Buy???

Requests for other online applications were received from the executives. It became quite evident that we needed to look at various alternatives including acquiring EIS software and building customized EIS applications. In 1989, the search began for EIS software which would allow us to build customized, user-friendly EIS applications easier. At that time, we were interested in a product which had both a mainframe and a PC component (this was before the big move to LAN environments). The three products available at that time which met our requirements were Execucom's Executive Edge, Comshare's Commander, and Pilot Software's Command Center. We went through the normal vendor and product analysis and selected the product which best matched our overall requirements. Just as we were ready to submit paperwork to purchase the software, a major cost reduction program began. The budget was drastically cut, and we could no longer afford to buy EIS software and associated hardware. Also, the executives liked what they had and didn't see the need for a better tool.

We continued to proceed in developing EIS applications in-house. Some of the applications ended up being built in CICS because of the amount of users and the type of application.

More SAS/AF EIS Applications

One of the executives who had not yet been "hooked" by the EIS systems we had created was the Chief Executive Officer (CEO). The Chief Financial Officer (CFO) came up with an idea to try to make the CEO aware of what computers can do for the business. A big problem in the past had been that some of the older executives did not realize what computer technology can do to help improve costs and business processes. The CFO wanted us to develop a very simple EIS application which would give the CEO the information most important to him and would also teach him a little about computer technology. He wanted to start out small and simple and eventually build more from there. Some of the items included daily cash report, used aircraft inventory, G-IV customer list, summary income

statement and balance sheet, and officer salary information.

We created a very simple SAS/AF application which was totally PF key driven. Some of the data was uploaded at night into a sequential file from a PC spreadsheet. We used PROC GPRINT to display this type of data on a screen for the executive with customized titles and footnotes. We also included the name and phone number of the user responsible for the data in case the executive had additional questions.

When we got done with the development, we showed it to the CFO. I was going to show him how it worked, but it was so simple that he just started using it with no training. This was the first time he had ever tried to do something with no instruction. The next step was to show it to the CEO and convince him that he needed a computer on his desk. Within a few days, the CEO had a computer on his desk and began using the applications. These applications answered many questions he always had when he came back from a trip and helped get information to him quicker.

Tips on Developing an EIS with SAS/AF

1. Keep it Simple - This is the most important tip and appropriate for any EIS application! Executives do not want to have to think too hard when using the computer. It needs to be intuitive.
2. If the EIS will be strictly a mainframe EIS, use graphics terminals with PF keys. The keyboards on terminals are much easier to use than many PC keyboards. Also, there are 24 PF keys which can be used in the AF application to make it easy to traverse from screen to screen. We set up all SAS/AF menus to be PF key driven.
3. Use standard PF key settings, colors, and formats throughout. We used PF1 for help, PF3 to exit, PF7 and PF8 to page, etc. We placed these types of keys at the bottom of the screens to make it easy for the user to figure out what keys to hit. Keep colors consistent and make sure the colors are coordinated and easy to read on the screen. Cyan, yellow, and white are popular colors for

us. We also use red to emphasize things. Be sure to include instructions on what to do next on each screen. Make menus and help screens consistent as far as color, format, etc.

4. When data on a screen is being provided by a particular user, put the user's name and extension at the bottom of the screen. This will make it easy for the executive to quickly call the user if he has any questions. It also shows data ownership and helps promote data currency and accuracy which is very important. If the data is out of date or inaccurate, the executive knows who to call. Most users are very good at keeping their data up-to-date, because they don't want to get phone calls from executives who have noticed untimely or inaccurate data.
5. Make the TSO set-up as easy as possible for the executive. We set up a special primary menu for the executives. When they log on to TSO, they do not get the ISPF Primary Options Menu. Instead, they get a customized Executive Information System menu. When they select an option from their main menu, a CLIST is called which invokes the appropriate application. Some options are hidden from certain executives if they do not have access.
6. Store graphs in a graphics catalog so they do not need to be created on the fly while the executive is waiting. We have a MAJOR graphics application which I described earlier in this paper. The graphs are created at night and placed in a graphics catalog for quick response time.
7. Response time is very important. Executives do not like to wait long for their information. We have tried to keep response time to a maximum of 1 to 2 seconds to go from screen to screen, graph to graph, etc.
8. Designate a person whose highest priority job responsibility is to help the executives. Any time they have a problem using the application, password problems, errors, etc., they know they call this person and get a quick response.

Where are We Going from Here?

GAC has again started talking about acquiring EIS

software to be used for future EIS applications. Even though the SAS applications have suited our needs, there is a desire to provide more functionality in some EIS applications. This would include some of the common EIS services such as traffic lighting to quickly spot variances, drill down reporting, exception reporting, etc. This would not be easy to do if we built it ourselves. We are also interested in more of a PC-based system and client-server architecture.

SAS has an EIS product now which merits an evaluation. We are in the preliminary evaluation phase now. One requirement has been to be able run on a PC and Macintosh platform. Unfortunately, SAS's EIS does not run on a Macintosh to date. I will have more information on our direction by February at SESUG '93.

Summary

SAS/AF was the perfect product to allow us to get started with EIS at GAC. The product was in-house and had the necessary components to enable us to quickly build easy systems to get the executives started. For companies who already have SAS and can't afford to buy a full blown EIS package, this is a good, economical way to get started. Of course, now a SAS site can acquire SAS/EIS for very little additional cost. If the EIS applications will be strictly mainframe applications, graphics terminals can be used which are easy to use and less expensive than PC's.

SAS/AF can help you get started with EIS for a minimal cost.