Data Center Structure of the Corporation

At The Upjohn Company we have multiple data centers and each data center has at least one or more information centers. The corporate headquarters is located in Kalamazoo with buildings spanning a distance of 20 miles as well as international locations. During the past five to ten years, the approach to SAS training has been an ad-hoc approach. This means that whenever it appeared that several persons needed specific SAS training, someone individually took initiative to contact SAS and arrange for the class to be taught on-site at our company. Most of the participants tended to come from the immediate area that scheduled the training and if hands-on workshops were included, they were taught for one specific operating system. Sometimes this same scenario took place in multiple locations within our company at irregular date intervals.

In 1990 our company initiated an intense “right-sizing” effort to reduce headcount and concentrate resources where they are most productive for the company. This effort in addition to the multiple platform design of version 6 allowed SAS training to be coordinated by one unit within the corporation. To provide insight of all SAS knowledge, a questionnaire was distributed at all training sessions and SAS presentations. The purpose of the questionnaire was to locate SAS customers with expertise in specific SAS products and to gather anticipated training requirements. An existing team, SAS On-going Support (SOS), with representatives from multiple divisions became the focal point for discussing and planning training requirements and customer support.

Action Plan for Training

GOAL
• Develop a training plan from requirements
• Provide structured approach to SAS training

Using questionnaire results and system access information, we compiled a mailing list. The list is used to communicate information about SAS issues and training to computer support centers in Kalamazoo and international locations. For each mass mailing, we include a form to allow addition or removal from the mailing list. The list is maintained electronically with links to our employee database to provide correct company routings and eliminate update maintenance.

The questionnaire included responses for estimated training requests. From this list, an action plan was developed to address how training requests could be met. For general SAS topics such as Base SAS, SAS/Graph®, and SAS/AF® with an interest level of ten or more persons, the proposed action is to offer an on-site IBT (Instructor Based Training) class. To provide introductory SAS training and to continually enhance SAS skills, the proposed action is a CBT (Computer Based Training) class or hands-on workshop of a half day duration. For topics such as SAS/OR® or SAS/ETS® where there was a low number of requests, the suggested action is to arrange for documentation or user group presentations by another person within the company.

A cost comparison was performed for three training alternatives: initiate internal course development, attend a public SAS class, or provide on-site classes (IBT) from SAS Institute. Based on 1991 rates, internal course development using a SAS training kit was estimated at $9300 per course as compared to approximately $4500 per 2-day class (IBT) from SAS Institute, and $1500 per student for attendance at a public SAS class. Based on these figures, the decision is to send students to a Public class if there are less than five persons.
or if the training is needed immediately. If there are more than 30 students to be trained, then consideration is given to the use of internal personnel teaching from a SAS Trainers Kit providing there is someone available with the proper expertise level to teach. In other cases, the recommendation is to contract the class to the SAS Institute to provide quality instruction by an expert.

Based on the action plan and cost analysis, a target implementation plan was developed. The plan was used and modified as needed at several team meetings. The plan simplified scheduling by allowing us to provide SAS Institute with a list of classes that we would like to offer over a period of several months. As normal, we did experience minor set-backs based on availability of SAS Institute instructors and availability of internal experts for development of workshops. However, steady progress is continuing and more SAS customers have participated in instructor based training this year than in past years. The staff to handle all 1991 SAS training, including registration processing, required less than one person.

Curriculum Paths

**GOAL**

* provide quality SAS training
* highlight the importance of skills application

Since much of our action plan relied on contracting classes to SAS Institute, we wanted to maximize benefits when a student attended the IBT classes. In order to accomplish this, an inventory of all training options available at the Upjohn company was compiled into one document. Based on the training options available, curriculum paths were established and offered as guidelines for managers to plan yearly training budgets.

The inventory of training options was compiled in a document to summarize each option. All training options are categorized by the source of the training medium such as video, CBT, workshop, or SAS Institute class. For each class a title is listed along with the contact person for enrollment or access. An expertise level, and prerequisite skills are included with each class description. In addition to VBT (Video Based Training) and IBT materials, several books, periodicals, and self-training guides are included in the document.

Based on the inventory, an integrated approach was used to design the curriculum paths. In general, TDI (Technology Delivered Instruction) methods such as CBT and video are used for preliminary training. Our TDI sources include products from CRWTH® and DPEC® corporation in addition to SAS Institute products. The Curriculum Paths point out that training must be supplemented with practice. This is indicated in boxes labeled “Skills Application”. This also highlights the need to practice a skill such as SAS/Graph and SAS/AF before attending an advanced class on the same topic.

Three curriculum paths were established. The first path is labeled "Information User". It is designed for data technicians, laboratory analysts, laboratory technicians, financial analysts, or statisticians. Due to the diverse backgrounds in this group, the path starts at a more elementary level of computer usage and concentrates on basic concepts oriented toward SAS skills required to perform reporting and analysis tasks. The second path is labeled "Programmer: Report Writing". This path concentrates on basic SAS skills required to complete report writing assignments, but does not include classes for application development such as AF and SCL. The third path is labeled "Programmer: Application Development" and it is assumed that the students have a background of database and systems design. This path concentrates on basic SAS skills and moves quickly to intermediate and advanced skills needed to develop AF and SCL applications. The curriculums labeled as "Programmer" assume a background of college subjects or equivalent computer science knowledge obtained from on-the-job experience. All paths include optional classes to accommodate special student needs based on prior training and immediate job function.
Planning and Marketing IBT Classes

GOAL
* Advanced notification to all SAS customers
* Schedule classes on a regular basis
* Maximize benefit of classroom attendance

To maximize the number of students and minimize per student charges associated with SAS Institute classes, we schedule each class at least 6 to 8 weeks in advance. We attempt to offer several classes in a three month period with each SAS IBT class being scheduled at least once a year. We market all scheduled classes by quarterly announcements to the corporate SAS mailing list and announcements are included in newsletters. This provides sufficient time for cancellation without penalty if less than 10 students register for the respective class. We have established several bulletin boards in various locations within the company for display of detailed descriptions of each class and use electronic mail lists when possible. By following these guidelines, we have been able to keep the average per student cost under $300 for two day classes and under $450 for three day classes. In 1990 we trained 52 students in a classroom setting as compared to 137 students in 1991. This represents an increase of more than 150% in classroom participation without an increase of internal SAS training staff.

The training is scheduled in rooms equipped with PC’s and mainframe access to each data center. This allows students to develop code during the class and save it in their own private work area for future reference. For each class we request data tapes from SAS Institute for each operating system that will be used by students in the class. We load the data tapes into public areas on the mainframe so each student can access the data and sample programs. In addition to flip charts, overhead projector, and white board, our training facility is equipped with an overhead display system for on-line demonstrations. This allows the instructor to demonstrate special features and show examples of coding syntax.

Each student receives SAS training materials and a general packet of internal documentation. The general packet describes how to access SAS version 6 for each data center, lists common terminology to describe the version 6 model, and explains window command syntax for the Display Manager System. Specific chapters of SAS manuals are listed to help students locate details and descriptions for future reference.

Summary

At our company we have established a corporate focus on SAS training. By coordinating efforts between data centers and using an integrated approach to curriculum paths, we provide training for a large and diverse user base. In 1991 we experienced a significant increase of student participation in classroom instruction without an increase in SAS training personnel. Our future goals include establishing a corporate expertise matrix to focus on ways to improve customer support. To accomplish this, we will continue to investigate ways to utilize all expertise available within The Upjohn Company rather than relying on expertise of individual units or divisions within the corporation.

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SAS CURRICULUM
INFORMATION USER
Data Technicians, Laboratory Analysts/
Technicians, Financial Analysts, and Statisticians

Beginner

- PC CBT: Fundamentals of the SAS System
- Mainframe CBT: Intro & Display Manager
- Class: Intro. Base SAS (++) or Workshop: (+) Fundamentals
- Workshop: Display Manager (+)
- Reading: Topics in SAS Manuals, Books
- Skills Application: SAS Projects with mentor
- Mainframe CBT: Using SAS, The SAS Language
- Video: SAS Assist
- Video: Using PROC Report (+)

Intermediate

- PC CBT: Proc Tabulate
- Class: SAS Report Writing
- Class: SAS Programming
- Workshop: SAS/ACCESS (Relational Data) (+)
- Reading: Relational Concepts
- Video: Using SQL in SAS (+)
- Class: SQL Processing with SAS
- Skills Application: SAS Projects with mentor

Optional

- Mainframe CBT: Using SAS/GRAPH (version 5)
- Class: SAS/GRAPH I
- Skills Application: SAS/Graph Projects with mentor
- Class: SAS/GRAPH II
- Introductory Statistics Class

Optional: Refer to both "PROGRAMMER" Curriculums: Advanced Level

(+) On order or under development
(++) Preferred option
SAS CURRICULUM

PROGRAMMER: REPORT WRITING
Persons with a Background of Computer Science Knowledge
(College or Job Experience)

Beginner
- Mainframe CBT: Intro & Display Manager
  - Class: Intro Base SAS (••)
  - Workshop: (*) Fundamentals
- Workshop: Display Manager (*)
- Skills Application: SAS Projects with mentor
- Reading: Topics In SAS Manuals, Books
- Mainframe CBT: Using SAS, The SAS Language
- SAS Reporting Projects

Intermediate
- Suggested Classes:
  - Classes listed on "INFORMATION USER" Curriculum: Intermediate Level
- Optional:
  - Other classes listed on "INFORMATION USER" curriculum: Optional Level

Advanced
- Mainframe CBT: Using SAS - Advanced Features
- Video: SAS Macro Variables
  - Workshop: (*) Macro Variables
  - Class: SAS Macro Language
  - Skills Application: Advanced SAS Projects

(••) On Order or Under Development
(•) Preferred Option
SAS CURRICULUM

PROGRAMMER: APPLICATION DEVELOPMENT
Persons with a Background of Computer Science Knowledge
(College or Job Experience)

Beginner

Mainframe CBT: Intro & Display Manager

Class: Intro.
Base SAS (++) or Workshop: (*) Fundamentals

Skills Application:
SAS Projects with mentor

Mainframe CBT: Using SAS,
The SAS Language

OPTIONAL:
Refer to "PROGRAMMER:
REPORT WRITING"
Curriculum: beginner level

Intermediate

Class: SAS Programming

Reading:
Relational Concepts

Video: Using
SQL in SAS (*)

Class:
SQL Processing with SAS

Workshop: SAS/Access
(Relational Data) (*)

Mainframe CBT:
Using SAS -
Advanced Features

Skills Application:
SAS Projects with Mentor

OPTIONAL:
Refer to "INFORMATION USER"
Curriculum: Optional Level

Advanced

Video: SAS Macro Variables

Workshop:
Macro Variables (*)

Class:
SAS Macro Language

Skills Application:
Advanced SAS Projects

Video: SCL
Appl. with SAS/FSP (*)

Video: SCL
Appl. with SAS/AF (*)

Class:
SAS/AF Software
Appl. Using SCL

Skills Application:
SAS/AF Projects

Class: Advanced
SCL Programming

(*) On Order or Under Development
(++) Preferred Option