-Lunch and Learn-
SAS for Non SAS Users

**Presentation Overview**

• SAS Overview

• SAS Industry Position

• SAS Products & Solutions

• SAS Clinical Solutions

• SAS for Marketing & IT

• SAS Base, Stat and Graph

• The SAS Professional
SAS Overview

SAS helps to achieve high level of performance. By delivering an integrated set of business intelligence software and services that enables business to not only navigate today’s challenges but also capitalize on tomorrow’s opportunities:

- **The SAS® Enterprise Intelligence Platform** — A core set of tools for integrating, managing and analyzing data, and then deploying information across the enterprise.

- **SAS® Intelligence Solutions** — Applications developed specifically to solve the critical business issues unique to key line-of-business and functional areas, including marketing, finance, IT, human resources and procurement.

- **SAS® Industry Solutions** — Industry-specific software, domain expertise and data models designed to help businesses achieve objectives more quickly, with less risk and at lower cost.

- **SAS® Programming platform** — Through programming code data is manipulate, manage, analyze and transform.
SAS Industry Position

Data Quality Tools
June 29, 2007

Multichannel Campaign Management
April 25, 2008

Business Intelligence Platforms
February 1, 2008

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Gartner RAS Core Research Note G00149359

Gartner RAS Core Research Note: G001566878

Source: Magic Quadrant for Business Intelligence Platforms, 2008, February 1, 2008, James Richardson, Kurt Schlegel, Bill Hostmann, Neil McMurchy
Gartner RAS Core Research Note: G00154227
Based on Gartner’s analysis, SAS is the leader…

Referenced Gartner Magic Quadrant reports are for SAS and SAS’ DataFlux products (DataFlux is a subsidiary of SAS).
SAS Industry Position

Gartner: Magic Quadrant for Business Intelligence Platforms, 2008
SAS Products & Solutions

Industries
- Aerospace
- Automotive
- Banking
- Communications
- Education
- Financial Services
- Government
- Health Insurance
- Healthcare Providers
- Hospitality & Entertainment
- Insurance
- Life Sciences
- Manufacturing
- Media
- Oil & Gas
- Retail
- Utilities

Data Integration
- Connectivity & Metadata
- Data Cleansing & Enrichment
- ETL
- Migration & Synchronization
- Data Federation
- Master Data Management

Enterprise Intelligence
- Platform
- Business Intelligence Analytics
- Intelligence Storage

Business Intelligence
- Reporting
- Query & Analysis
- OLAP
- Integrated Analytics
- Visualization
- Microsoft Office Integration

Analytics
- Statistics
- Data & Text Mining
- Data Visualization
- Forecasting & Econometrics
- Optimization
- Model Mgmt. and Deployment
- Quality Improvement

Solution Lines
- Activity-Based Management
- Compliance
- Customer Relationship Mgmt.
- Financial Intelligence/BPM
- Human Capital Intelligence
- IT Management
- Performance Management
- Profitability Management
- Risk Management
- Service Intelligence
- Supplier Intelligence
- Supply Chain Intelligence
- Sustainability Management
- Web Analytics
- On Demand Solutions
## SAS Products & Solutions

### Industries
- Automotive
- Banking
- Communications
- Energy & Utilities
- Financial Services
- Government & Education
- Health Insurance
- Healthcare Providers
- Hospitality & Entertainment
- Insurance
- Life Sciences
- Manufacturing
- Retail
- Government & Academia

### Solution Lines
- Activity-Based Management
- Customer Relationship Mgmt.
- Financial Intelligence/BPM
- **Human Capital Mgmt.**
- Performance Management
- Profitability Management
- Risk Management
- Supply Chain Intelligence
- Web Analytics
- OnDemand Solutions

### Business Intelligence
- Reporting
- Query & Analysis
- OLAP
- Integrated Analytics
- Visualization
- Microsoft Office Integration

### Data Integration & ETL
- Connectivity & Metadata
- Data Cleansing & Enrichment
- ETL
- Migration & Synchronization
- Data Federation
- Master Data Management

### Analytics
- Data & Text Mining
- Forecasting & Econometrics
- Model Mgmt. and Deployment
- Operations Research
- Quality Improvement
- Statistics

### Data Integration & ETL
- Connectivity & Metadata
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### Analytics
- Data & Text Mining
- Forecasting & Econometrics
- Model Mgmt. and Deployment
- Operations Research
- Quality Improvement
- Statistics
SAS Clinical Solutions

- **SAS® for Clinical Data Integration** is the foundation you need to ensure standard, trusted clinical data. With SAS, you can gain both speed and efficiency by automating repeatable clinical data integration tasks.

- **SAS® Drug Development** provides a centralized, integrated system for managing, analyzing, reporting and reviewing clinical research information. The solution enables life sciences organizations to get better products to market faster by more effectively assessing the safety and efficacy of research compounds and by facilitating collaboration across trials, phases and therapeutic areas.

- **SAS® for Patient Safety** is a comprehensive safety solution that features safety reporting, signal detection, and root cause analysis in a single offering. While less rigorous analytics work for certain applications, the critical nature of patient safety demands the best analytics available.

- **SAS® for Life Sciences Sales and Marketing** delivers unique customer insights that life sciences firms can use to execute more efficient marketing, sales and service strategies. SAS provides proven analytics to power sales and marketing execution.
SAS® for Marketing & IT

Manage Data and Distribute Info

Predict Customer Behavior

Profile & Segment Customers
Manage Data and Distribute Info

Business Capabilities:
- Access virtually any database to create a customer-centric data repository
- Move data between operational systems and marketing
- Cleanse your data to ensure decisions are made using the right data

SAS® Functional Capabilities:
- Data integration
- Data quality
- Access to existing databases
- Data storage, where appropriate
Predict Customer Behavior

**Business Capabilities:**
- Perform a extensive range of analyses, including:
  - Customer value analysis
  - Market basket analysis
  - Customer profitability
  - Response modeling
  - Churn analysis
- Credit scoring

**SAS® Functional Capabilities:**
- Data mining
- Text mining
- Customer profitability tracking
- Web behavior tracking
- Forecasting
- Credit risk analysis
Profile & Segment Customers

Business Capabilities:
- Develop and evolve segments based on attitudinal needs, life stage, and current and future value

SAS® Functional Capabilities:
- Data Mining
- Clustering
- Customer Profitability
- Reporting/OLAP
SAS Base, Stat and Graph

• Although SAS has several industry specific solutions. There is standard package called Base SAS that has programming flexibility to handle any data related task.

• Base SAS provides a scalable, integrated software environment specially designed for data access, transformation and reporting. It includes a fourth-generation programming language; ready-to-use programs for data manipulation, information storage and retrieval, descriptive statistics and report writing; and a powerful macro facility that reduces programming time and maintenance headaches.

• It runs on all major computing platforms (UNIX, Mainframe and PC), its code is portable from one system to the other, has the functionality to interchange data and run process among SAS instances in different platforms and talks other small and large databases such as MS Access, Excel, Oracle, DB2, SQL server, Sybase….etc. SAS can communicate with other SAS session in other environments. In other words you can connect your SAS PC session to your UNIX or Mainframe SAS environment run jobs and access data.
SAS Base, Stat and Graph

- SAS Base usually is licensed with other modules such as SAS Stat and Graph (three of its most popular products).
- Programming in SAS Base, Stat and Graph is relatively simple to learn.
- Task can be accomplished writing SAS programs or using the point and click tools available with SAS Base or at the PC level using the drag and drop graphical interface call Enterprise Guide.

- SAS commands menu bar
- SAS log reports execution of SAS program and reports errors in syntax
- SAS Editor is used to write and edit the SAS programs
- SAS Output list output from SAS program

SAS Explore to browse SAS data sets (tables) and other info
SAS Programming Structure

Most SAS programs consists of Data steps, procedures and macro code

- In a data step data is transformed at the record level. Data steps act on data sets (tables)
  - Recode data
  - Subset data
  - Create new fields
  - Reformat data

- SAS Procedure manipulate data sets and create data sets with results
  - Create summaries using data summarization procedures
  - Run statitical procedures for Analytics
  - Sort data
  - Graph data
  - Manipulate data via SQL

- Macros automate common and repetitive process

Data steps, procedures and macro processing make provide user with a very powerful frame work to tackle simple and complex data projects in an efficient fashion.
A lot of SAS programming is Logically “putting together” subroutines.
/* Example (Triglyceride Changes Adjusted for Glycemic Control) */

DATA TRI;
  INPUT TRT $ PAT HGBA1C TRICHG @@;
  DATALINES;
  FIB  2 7.0  5  FIB  4 6.0 10  FIB  7 7.1  -5
  FIB 16 6.6 10  FIB 17 7.4  10  FIB 19 5.3  20
  FIB 21 6.5 15  FIB 23 6.2  5  FIB 24 7.8  0
  FIB 27 8.5  5  FIB 28 9.2  25  FIB 30 5.0  25
  FIB 33 7.0 10  FIB 34 7.1  5  FIB 35 8.5  40
  GEM  1 5.1  10  GEM  3 6.0  15  GEM  7 5.4  10
  GEM 10 5.7  15  GEM 12 6.5  -5  GEM 14 5.6  10
  GEM 15 6.7  5  GEM 16 5.1  5  GEM 18 5.3  10
  GEM 22 6.0 10  GEM 23 5.5  10  GEM 24 6.0  20
  GEM 27 7.9 35  GEM 31 7.4  0  GEM 32 5.0  0
  GEM 34 6.5 10
;

PROC SORT DATA = TRI;
  BY TRT HGBA1C TRICHG;

/* Print data set */
PROC PRINT DATA = TRI;
  VAR TRT PAT HGBA1C TRICHG;
  TITLE1 'Analysis of Covariance';
  TITLE2 'Example 11.1: Triglyceride Changes Adjusted for Glycemic Control';
RUN;

/* Plot data, by group */
PROC PLOT VPERCENT=45 DATA = TRI;
  PLOT TRICHG*HGBA1C=TRT;
RUN;

/* Obtain summary statistics for each group */
PROC MEANS MEAN STD N DATA = TRI;
  BY TRT;
  VAR HGBA1C TRICHG;
RUN;

/* Use glycemic control as covariate */
PROC GLM DATA = TRI;
  CLASS TRT;
  MODEL TRICHG = TRT HGBA1C / SOLUTION;
  LSMEANS TRT/PDIFF STDERR;
RUN;

/* Compare groups with ANOVA, ignoring the covariate */
PROC GLM DATA = TRI;
  CLASS TRT;
  MODEL TRICHG = TRT / SS3;
RUN;

"/Example (Triglyceride Changes Adjusted for Glycemic Control) */
### Example 11.1: Triglyceride Changes Adjusted for Glycemic Control

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<td>9.3</td>
<td>-40</td>
</tr>
</tbody>
</table>
Example 11.1: Triglyceride Changes Adjusted for Glycemic Control

The GLM Procedure

Class Level Information

Class          Levels   Values
TRT            2        FIB GEM

Number of Observations Read    34
Number of Observations Used     34

Analysis of Covariance
Example 11.1: Triglyceride Changes Adjusted for Glycemic Control

The GLM Procedure

Dependent Variable: TRICHG

<table>
<thead>
<tr>
<th>Source</th>
<th>DF</th>
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<th>Mean Square</th>
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R-Square  Coef Var  Root MSE  TRICHG Mean
0.684785  -131.6234  9.678192  -7.352941

Standard Parameter  Estimate  Error  t Value  Pr > |t|

213 Temple Way, Colonia, NJ 07067
Tel: (732) 371-9512
Fax: (732) 388-2042
www.datameans.com
SAS Interactive
The SAS Professional

Clinical

IT

Analytical

Outcomes Research
General Characteristics of a SAS Professional

<table>
<thead>
<tr>
<th>Most Relevant</th>
<th>Nice to have</th>
<th>Some how relevant</th>
<th>No that Important</th>
<th>Clinical</th>
<th>Biostatistics</th>
<th>Health Outcomes Research</th>
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## SAS Professional by Industry

<table>
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<th>Clinical</th>
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## SAS Professional by Module

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### Most Relevant

### Nice to have

### Some how relevant

### No that Important

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