



Leveraging the Power of SAS®



SYSTEMS SEMINAR CONSULTANTS, INC.

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About Systems Seminar Consultants



Established in 1982, SSC specializes in consulting and SAS training.

Consulting – We help our clients access, build data warehousing, report, extract, clean, analyze, validate and understand their data. The projects we manage are automated, the programs are efficient, and we provide excellent documentation and post-project support.

Training – All of our trainers are expert consultants. We can customize our exercises with client data, and we provide complimentary follow up help desk support.

Publications and Presentations – We are known world-wide for our SAS newsletter and award-winning SAS papers.



What is SAS?



A large, integrated system of software for data analysis, business analytics, and reporting.



Where Does SAS Come From?



- Started in early 1970's
- Authored by programmers and analysts
- High quality, well designed software
- Owned by SAS Institute of Cary, NC
- Best place to work in the US 2010 (Fortune Magazine)
- Great research and development and support
- 23% of 2009 sales invested in R & D



SAS Characteristics



- Language of defaults
- A great programming language
- Extensive prewritten procedures
- Appropriate for ad-hoc through fully productionalized systems
- Well liked by SAS users and programmers
- Features just not available in other software
- Misunderstood by some IT organizations



What Can SAS Do?



- Read and write almost any data format!
- Powerful data handling language
- Excellent data cleansing tool
- Countless options for output (print, HTML, excel, PDF etc.)
- Interact with multiple host systems
- Email or ftp results
- Can you imagine it?



Who are SAS Users?



95%+ Fortune 500 Companies, All Industries

- Executives
- Managers
- Analysts
 - Power users
 - Occasional users
- Developers
 - Familiar w/ SAS
 - Not familiar with SAS
- SAS Administrators

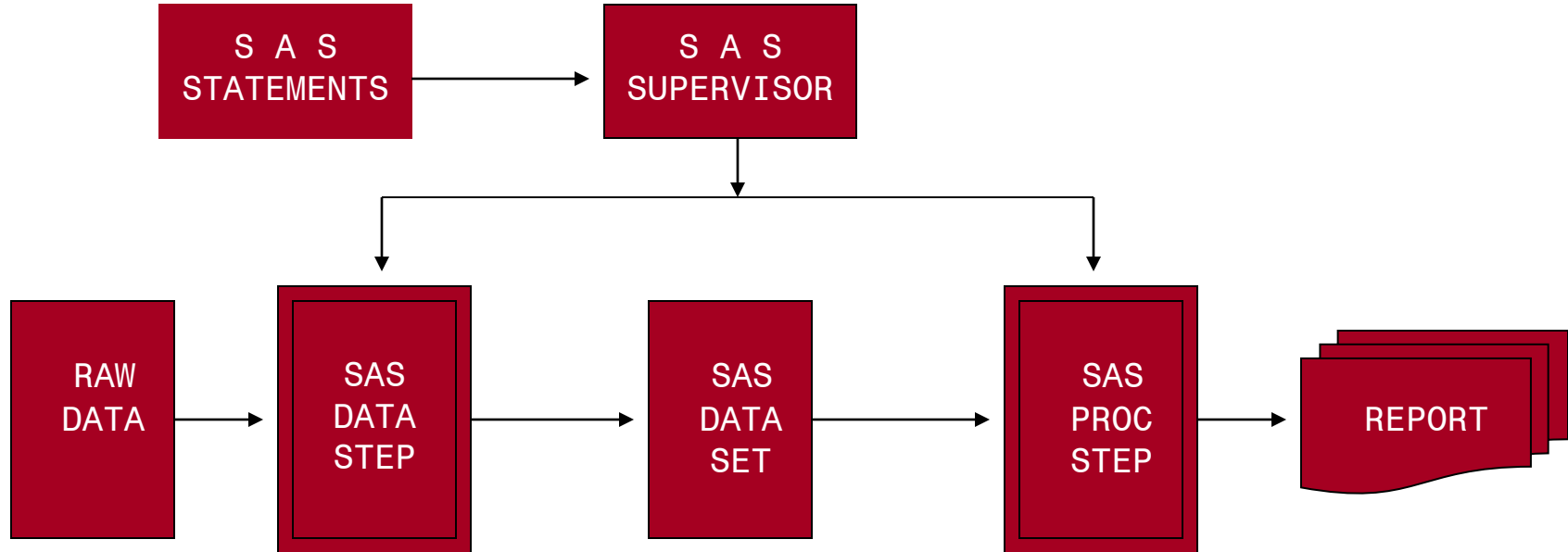


Structure of SAS



SAS consists of:

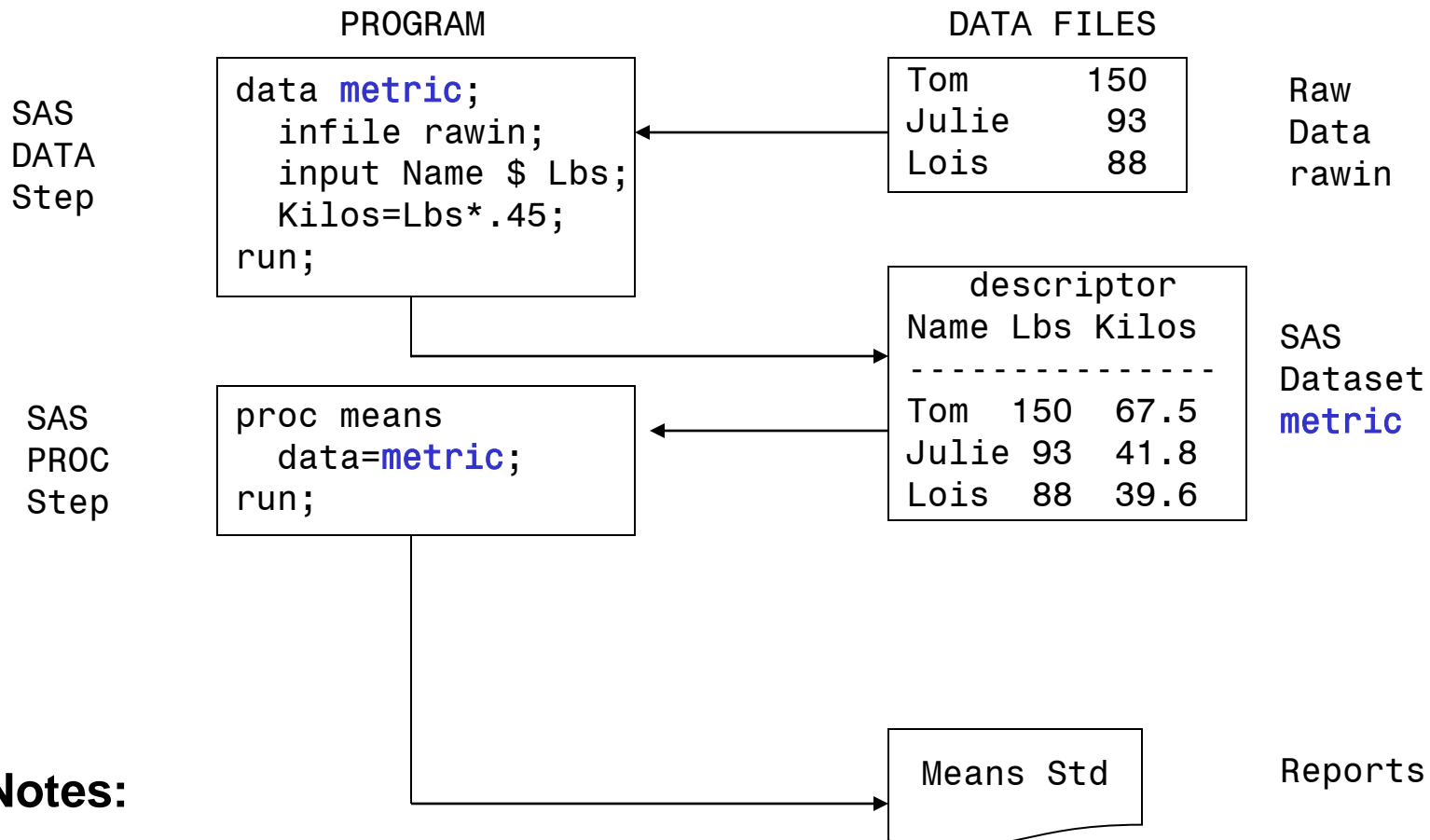
1. a data handling language (DATA step)
2. a library of pre-written procedures (PROC step)



SAS DATA and PROC Steps



DATA steps create SAS datasets, PROC steps process or analyze them.



Notes:

- RUN; marks the end of a SAS step.
- More steps may follow.



Base SAS

Flexible and extensible 4gl programming language for data access, transformation and reporting

Base SAS forms the foundation for all SAS solutions.

SAS/Connect

Connects computers to run SAS remotely and access data from various platforms.

SAS/Access

Data access to relational/nonrelational databases, data warehouse appliances, enterprise applications

SAS/Graph

Charts, graphs and maps for business intelligence applications.



Most SAS systems are custom written.

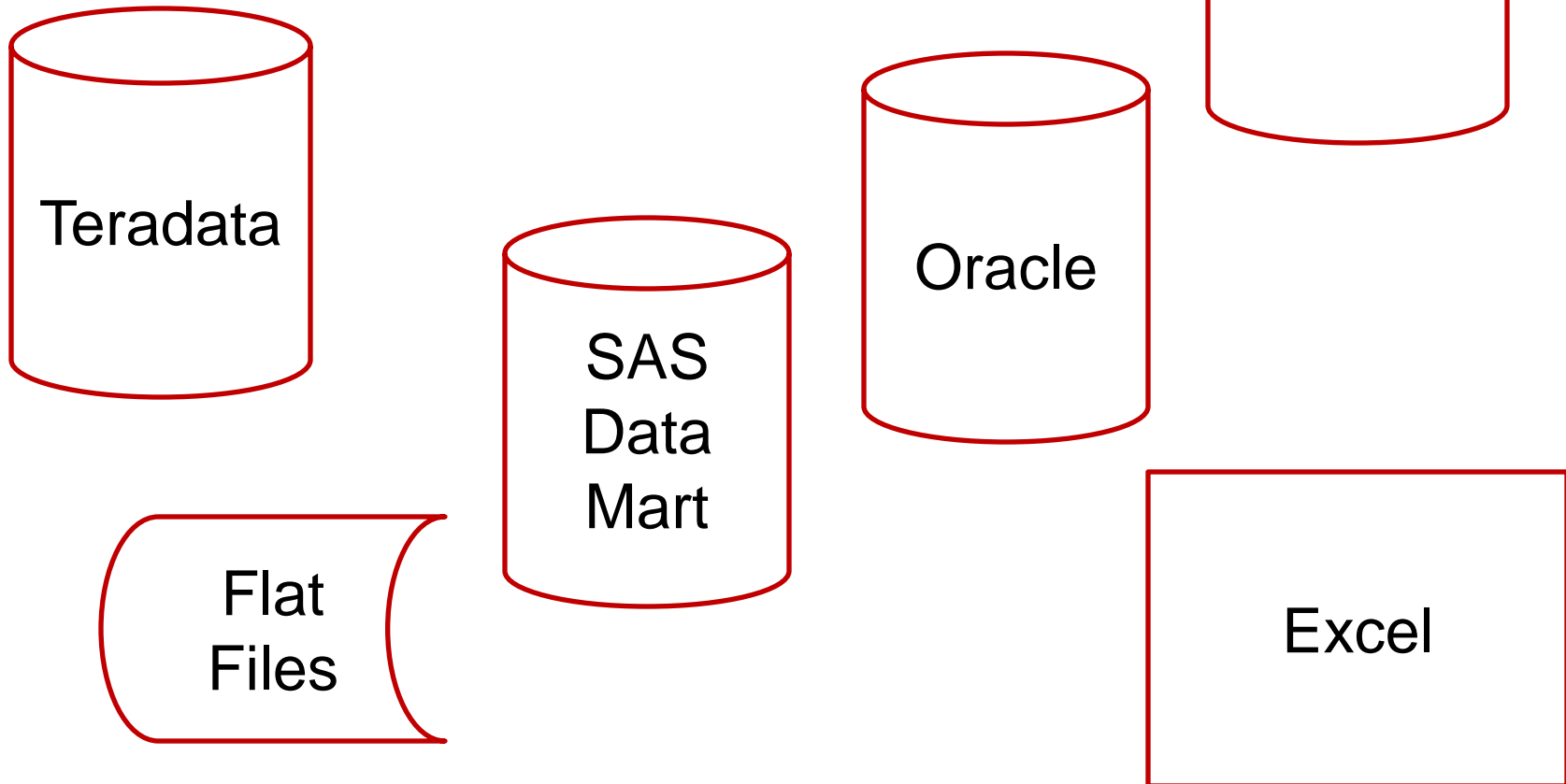
- Only a few SAS products required
- Simple statistics
- Custom logic
- Extensive data access
- Applicable to batch, ad hoc and production systems
- Distribution via HTML, PDF, Excel, Print
- Can be efficient, well written, and well documented
- SSC specialty



SAS Data Sources



- Supports disparate data sources
- Support of SQL
- Read, write, format, and analyze any data



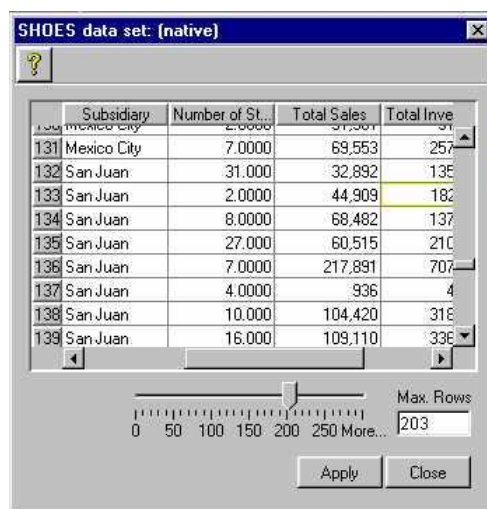


What is a SAS dataset?

- Internal data storage structure
- Definition of the dataset structure is maintained in the Dataset Descriptor
- Data is a tabular form

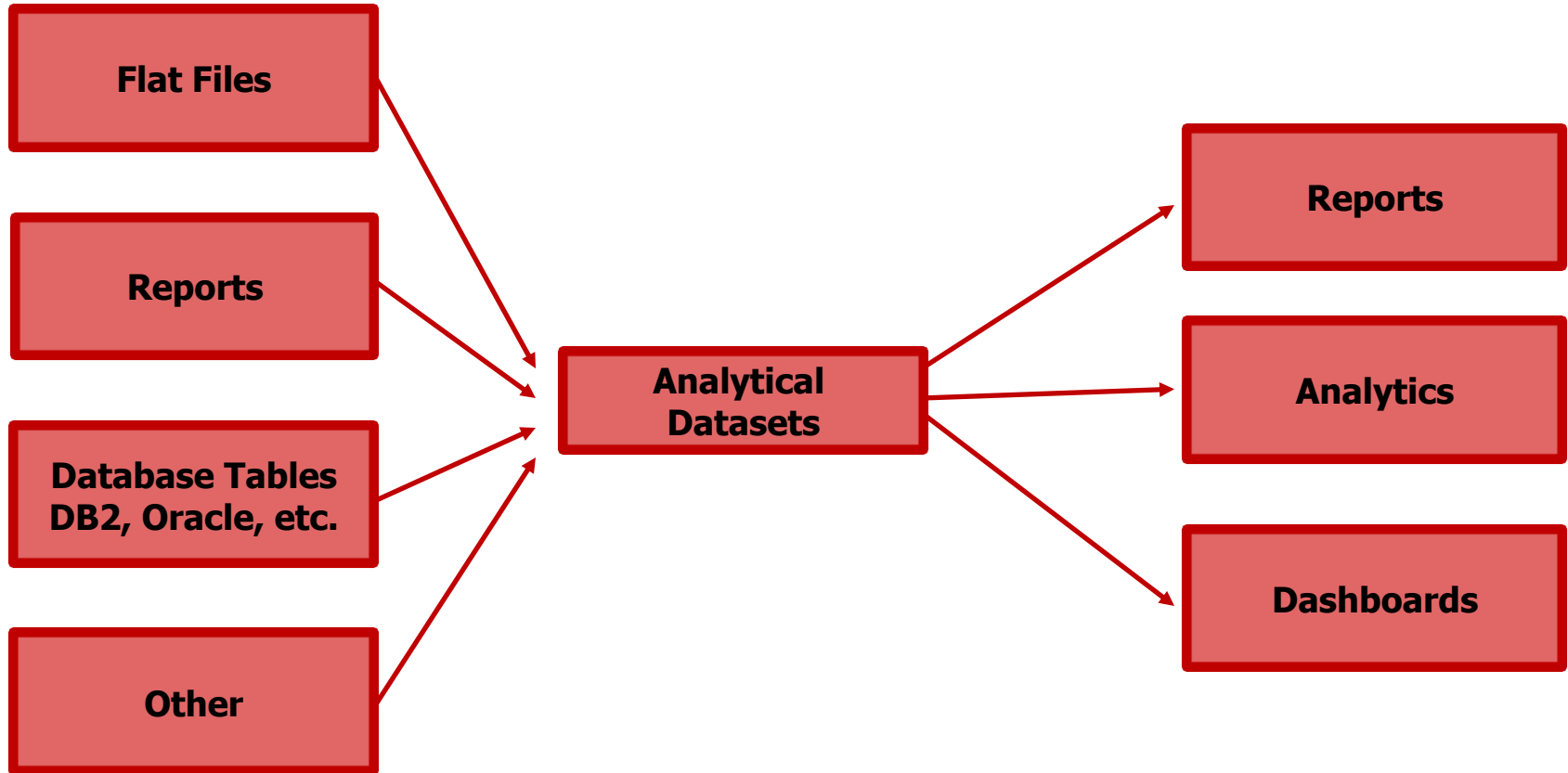
Why use SAS datasets?

- SAS datasets are easy to use
- Allow data analysis to be the focus, not data storage and format

A screenshot of a SAS window titled "SHOES data set: (native)". The window displays a table with four columns: "Subsidiary", "Number of St.", "Total Sales", and "Total Inve". The table contains 13 rows of data. Below the table is a scroll bar and a "Max. Rows" control set to 203. The "Apply" and "Close" buttons are visible at the bottom of the window.

	Subsidiary	Number of St.	Total Sales	Total Inve
131	Mexico City	7.0000	69,553	257
132	San Juan	31.0000	32,892	135
133	San Juan	2.0000	44,909	182
134	San Juan	8.0000	68,482	137
135	San Juan	27.0000	60,515	210
136	San Juan	7.0000	217,891	707
137	San Juan	4.0000	936	4
138	San Juan	10.0000	104,420	318
139	San Juan	16.0000	109,110	336

Data Warehousing with SAS



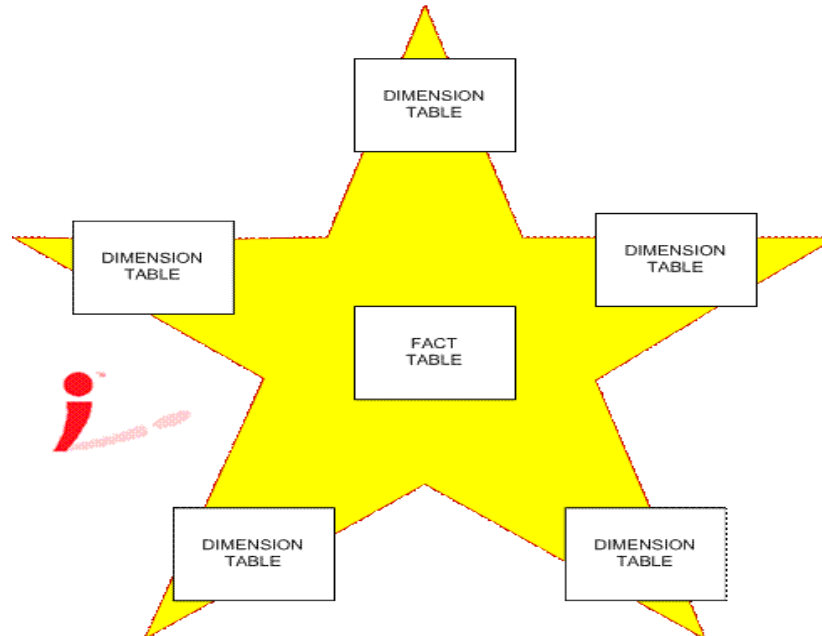
**Data
Sources**

Data Marts

**Analysis and
Reporting**



- Design tables ranging from simplistic tables to full functioning dimensional data models
- Tables designed for summary reports and drill down analysis
- Tables can be designed for quantitative analysis and business intelligence



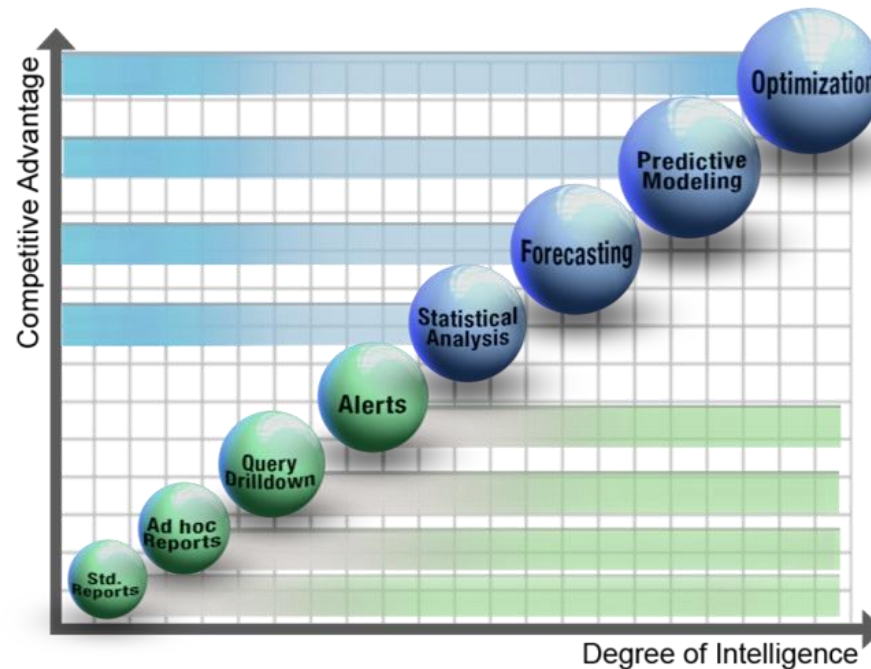


Range of techniques and processes for:

- Collection, classification, analysis and interpretation of data
- Revealing patterns, anomalies, key variables and relationships
- Leading ultimately to new insights and better answers faster

SAS Analytics provides an integrated environment for:

- Predictive and descriptive modeling
- Data mining
- Text analytics
- Forecasting
- Optimization
- Simulation



SAS Analytic Advantage



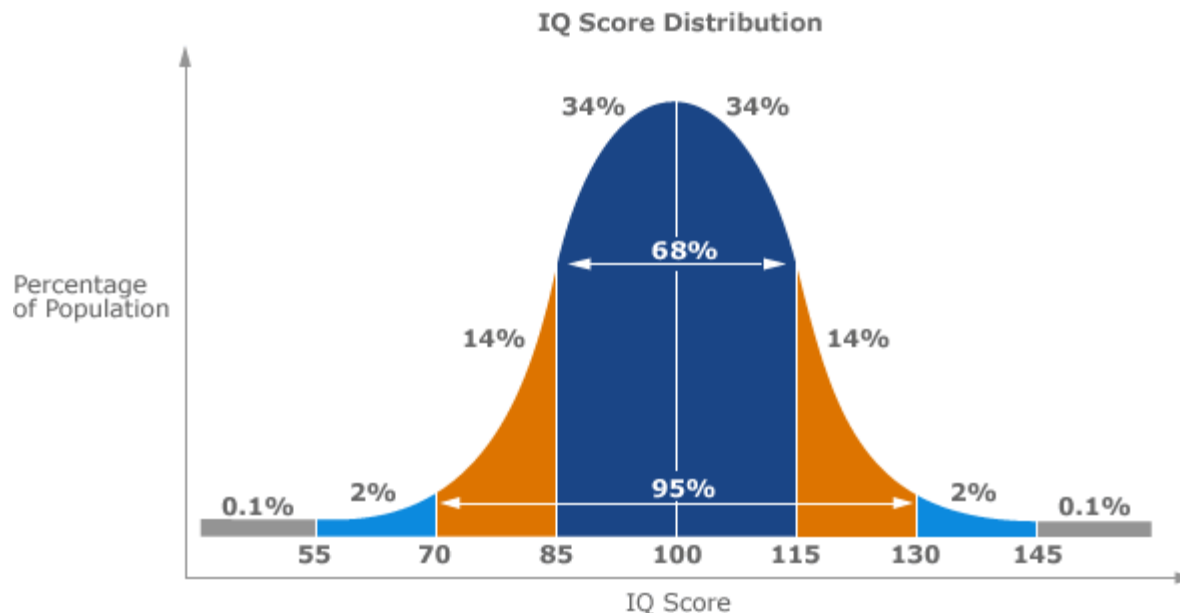
- Explore and exploit corporate data for strategic business advantage
- Analyze huge quantities of data to make discoveries, solve complex problems and deploy results throughout the enterprise
- Obtain the best results, discover new insights more quickly and easily
- Extend the power of SAS to meet your evolving analytical needs



A Sample of Available Statistics



- Simple (frequencies, percentages, sums, averages, etc.)
- Bayesian Analysis
- Multivariate Procedures
- Survival Analysis
- Scoring, Standardization, & Ranking
- Regression
- ANOVA
- Mixed Modeling
- Categorical Data Analysis
- Discriminant Procedures
- Survey Sampling & Analysis
- Clustering



SAS Reporting Tools



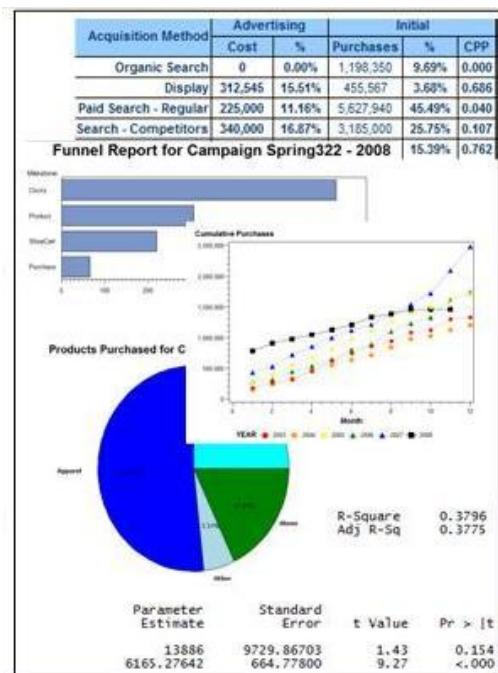
- Base SAS customized Data Step reporting
- PROC SQL, macro sub languages
- Enterprise Guide
- Information Delivery Portal
- Enterprise Miner
- Web Report Studio & Viewer
- Add-in for Microsoft Office



Reporting With SAS



- Numerous procedures designed specifically for reporting
- SAS Output Delivery System (ODS) routes output to common formats
- Easy export to Excel
- Color graphics and dashboards
- Interactive, web-based reporting
- Custom report packages anything is possible (SSC specialty)



Analysis and Reporting



- Production reports, systems delivery, static reports
- Interactive interfaces for adhoc analysis
- Statistical analysis
- Dashboard design

WEEKLY SALES - WEEK ENDING 29MAY2010

STORE LEVEL REPORT

Includes returns as negative sales

PRODUCTS	LAST WEEK			QTD			YTD		
	UNITS	\$ AMOUNT	% SALES	UNITS	\$ AMOUNT	% SALES	UNITS	\$ AMOUNT	% SALES
DEPT 010	4	\$ 23.96	2.9%	32	\$ 189.76	2.8%	84	\$ 498.13	2.7%
DEPT 020	.	\$ (1.99)	-0.2%	12	\$ 235.08	3.5%	25	\$ 489.76	2.7%
DEPT 030	12	\$ 356.28	43.6%	97	\$2,821.76	42.0%	254	\$ 7,388.94	40.6%
DEPT 040	25	\$ 244.76	30.0%	199	\$1,908.49	28.4%	523	\$ 5,015.78	27.5%
DEPT050	10	\$ 193.90	23.7%	82	\$1,557.22	23.2%	214	\$ 4,815.15	26.4%
TOTAL	51	\$ 816.91	100.0%	422	\$6,712.31	100.0%	1100	\$18,207.76	100.0%

A Drill Down Report



HTML Report Selection Screen

SELECT REPORT - 09MAY2010

[Click here](#) to return to weekly reports

STATE	METRO			
SSC		WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
ALABAMA	ALABAMA	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
	BIRMINGHAM	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
	GAINESVILLE	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
	MOBILE	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
	MONTGOMERY	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
ALASKA	ALASKA	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
	ANCHORAGE	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
	FAIRBANKS	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
	JUNEAU	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY
	KETCHIKAN	WEEKLY SALES - DEPT	WEEKLY SALES - PROMO	GMA SUMMARY

A Drill Down Report



Report Details

Save As

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Home

WEEKLY SALES - WEEK ENDING 29MAY2010

MOBILE METRO LEVEL REPORT

Includes returns as negative sales

PRODUCTS	LAST WEEK			QTD			YTD		
	UNITS	\$ AMOUNT	% SALES	UNITS	\$ AMOUNT	% SALES	UNITS	\$ AMOUNT	% SALES
DEPT 010	4	\$ 23.96	2.9%	32	\$ 189.76	2.8%	84	\$ 498.13	2.7%
DEPT 020	.	\$ (1.99)	-0.2%	12	\$ 235.08	3.5%	25	\$ 489.76	2.7%
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SAS Graph Capabilities



- High quality business charts and plots
- Imbed graphics in printed reports
- Supports all ODS destinations
- Create GIFs, JPGs, ActiveX
- Basic Maps Included!
- Drill-through Graph Capability

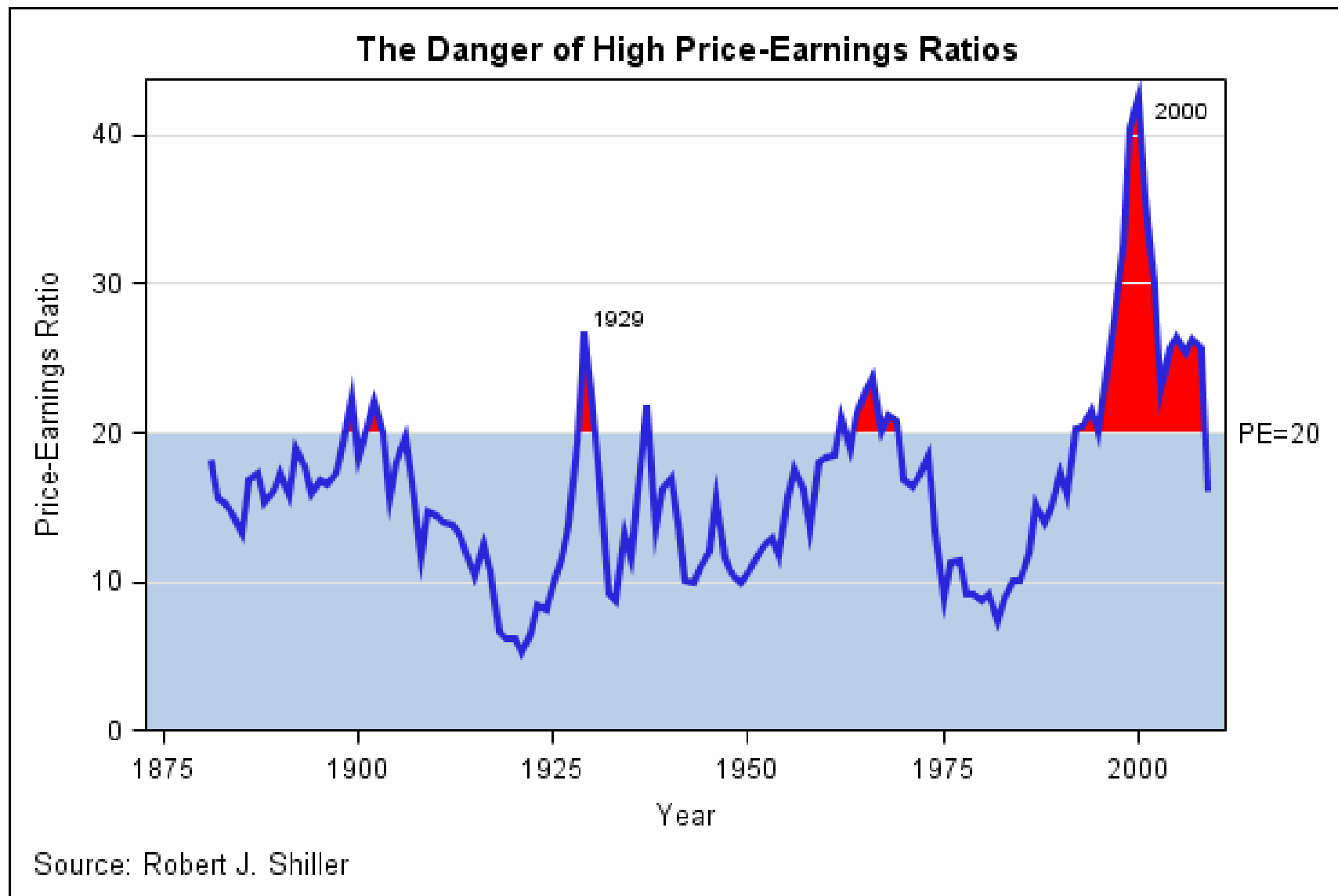


A Sample SAS Graph Program

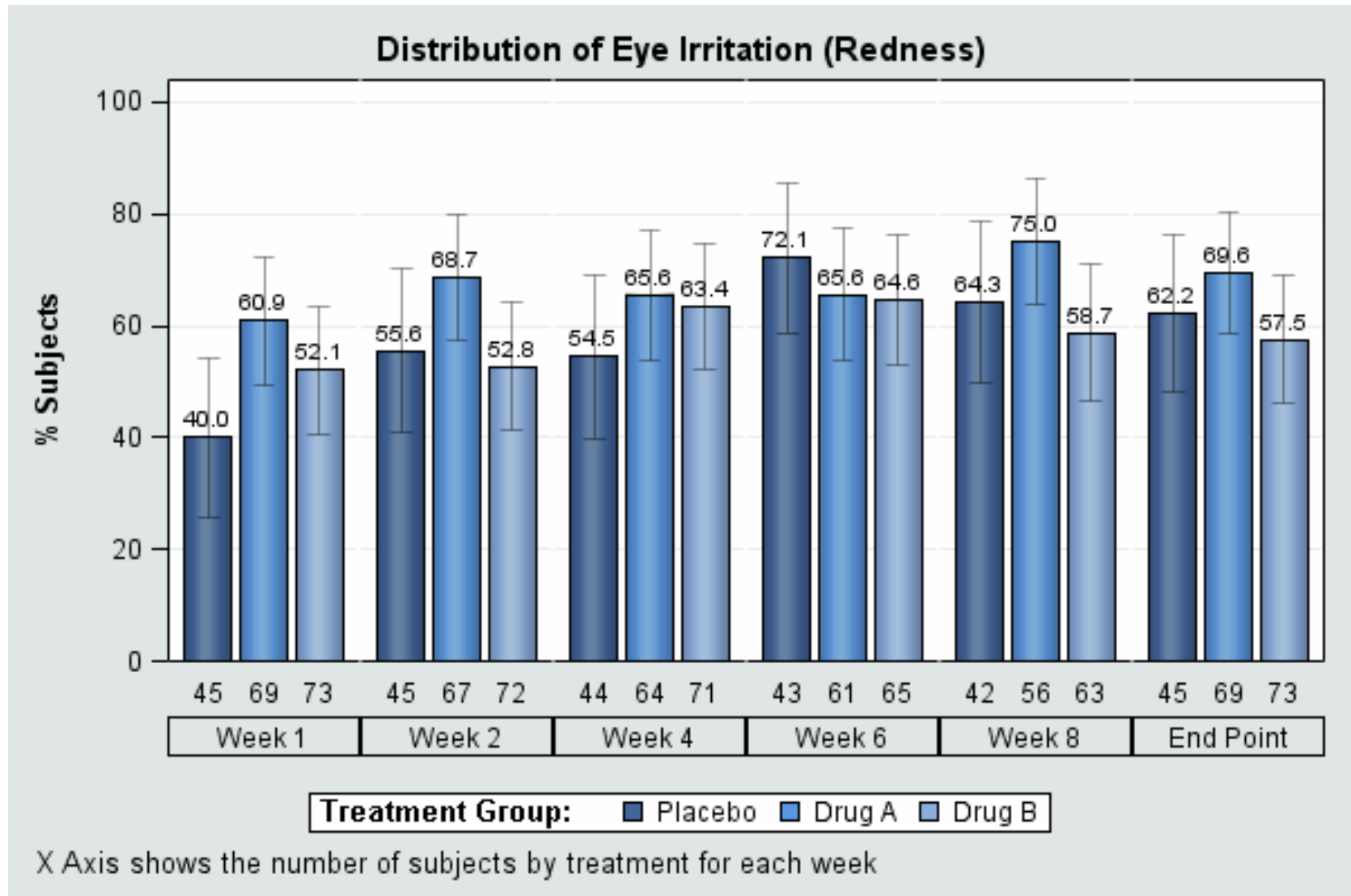


```
data sasuser.pe_data;
  label pe10="Price-Earnings Ratio";
  input year re pe re10 pe10 ;
datalines;
1881 8.748326716 12.63265306 7.537763587 18.21479737
1882 . . . .
2009 . 58.97580645 51.41811354 16.1622791
;
run;
ods listing close;ods html file='pe.html' path='.' style=listing;
ods graphics / reset width=600px height=400px imagename="pe||
  imagefmt=gif;
title "The Danger of High Price-Earnings Ratios";
footnote j=1 "Source: Robert J. Shiller";
proc sgplot data=sasuser.pe_data noautolegend;
  yaxis offsetmin=0;
  band x=year upper=pe10 lower=0 / fillattrs=(color=red);
  band x=year upper=20 lower=0;
  refline 20 / label="PE=20";
  refline 10 20 30 40 / lineattrs=GraphGridLines;
  series x=year y=pe10 / lineattrs=GraphData1(thickness=3)
  datalabel=label;
run;
```

A Sample SAS Graph Plot



A Sample SAS Graph Bar Chart



A Mapping Example



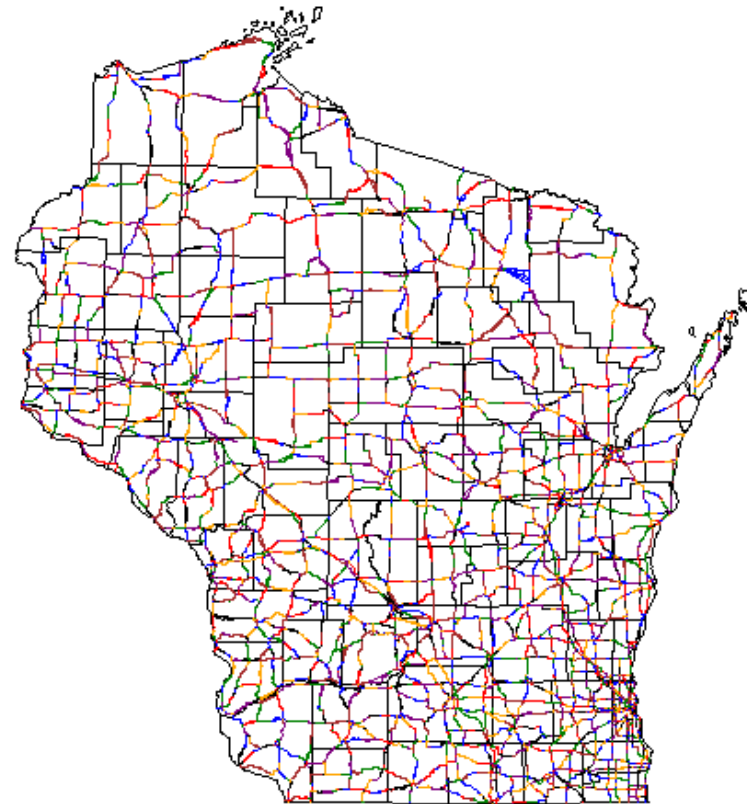
Maps & Drill Through Capability

[Statewide Map](#)

[ArcIMS State Map](#)

CountyName
ADAMS
ASHLAND
BARRON
BAYFIELD
BROWN
BUFFALO
BURNETT
CALUMET
CHIPPEWA
CLARK
COLUMBIA
CRAWFORD

State of Wisconsin Forecasting System





SAS Integration Technologies

Protocols to enable communication between different SAS tiers

Encompasses standard protocols like:

- LDAP for directory access
- CORBA & COM/DCOM for inter-application communication
- Microsoft Message Queuing or IBM WebSphere MQ for messaging

Grid Computing

Computing-intensive applications allocated across hardware resources for improved performance and business continuity





Data Integration Studio

A visual design tool for building, implementing, and managing data integration processes regardless of data sources, applications, or platforms.

AppDev Studio

An application development product that supports the creation of Java Applications that leverage the back-end business intelligence and analytics power of SAS.

SAS Enterprise Guide

A powerful Windows client application that provides a GUI for transparently accessing the power of SAS.

Information Delivery Portal

A single access point for aggregated information via an easy-to-use web based interface.



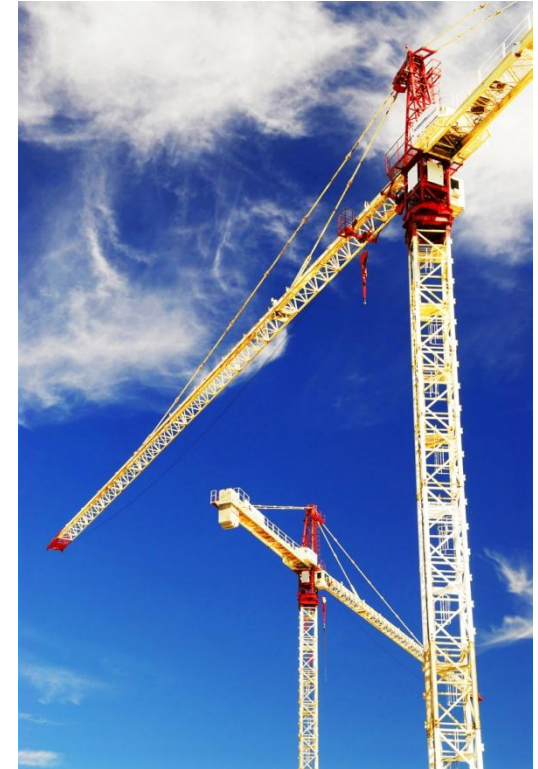
- Powerful analytic procedures
- Data models and associated data management procedures
- Reporting made easy
- Highly configurable
 - Incorporate your unique business rules and objectives
 - Align with your IT infrastructure and tune to meet desired service levels
- Successful companies have seen proven, measurable results



Vertical Solutions Offered (partial list)



- **Customer Intelligence**
 - Marketing Automation/Optimization
 - Web Analytics
- **Merchandise Intelligence**
 - Merchandise Planning
 - Revenue Optimization
- **Operations Intelligence**
- **Service Intelligence**
 - Warranty analysis and reserve forecasting
- **Fraud Prevention & Detection**



How We Work With SAS And Our Clients



Automating Processes



- Automate data extraction, transformation, and loading processes from a variety of data sources.
- Create easy to maintain, automated data and reporting systems, in many formats including HTML, Excel, Microsoft Word, and COGNOS.
- Develop interactive reports so business users can access data in real time, instead of having to wait for programming assistance.



Leveraging Untapped Data



- Develop easy, efficient ETL processes to access untapped data
- Paid Search, Display Ads, Web Traffic, Email Campaigns, Unstructured Data
- Apply company analytics to new data sources



Proactive Decision Making



- See trends going into a sales quarter and predict the future outcome.
- Put programs in place to avoid the problem and protect your revenue stream.
- Answer “Why is this happening?” “What will happen next?” “What’s the best/worst that can happen?” “What if these trends continue?”



Vertical Solution Implementation



- Manage projects
- Define physical architecture
- Deploy software
- Tune application performance
- Develop data extracts
- Design application add-ons
- Provide ongoing administration & support



Previous SSC Projects



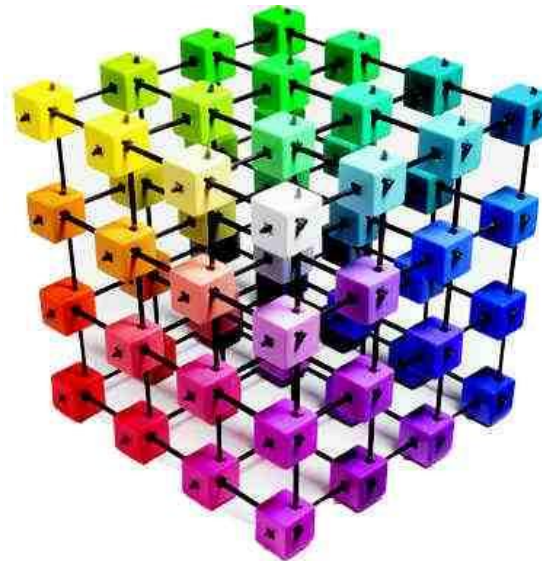
- Automate collection and distribution of manual Excel processes
- Develop numerous credit and finance reports
- Automate the promotional campaign selection process and create files ready for Affinium
- Analyze the cost of each campaign and the associated sales and profit metrics
- Integrate geographic and Acxiom Data to identify potential customers.
- Develop pipeline reports to examine the sales funnel and identify areas for improvement
- Create a data mart to view your media spend and sales funnel data in order to make quick decisions that optimize your media spend



Our Data Marts and Warehouses



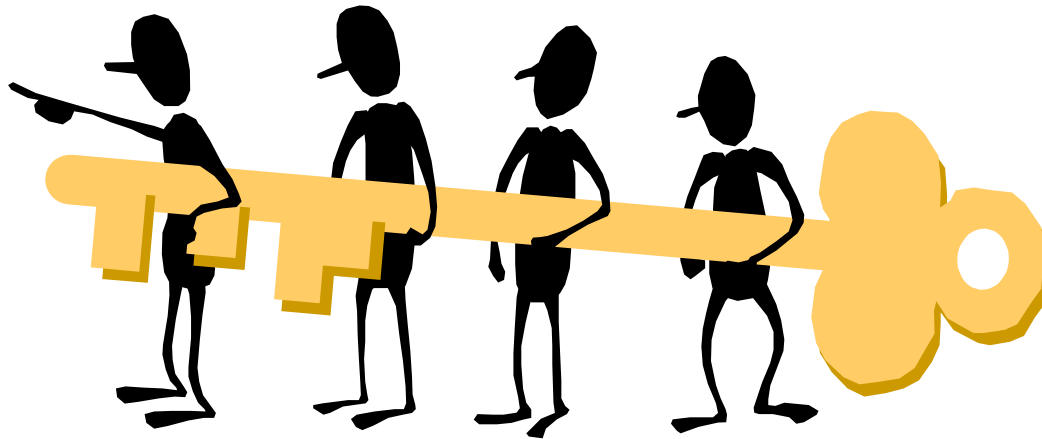
- Reduce the cost and time to create existing reports
- Enable new business processes and get the most out of your data.
- Design data marts specifically to answer analytical questions and simply create executive reports.



Custom Systems



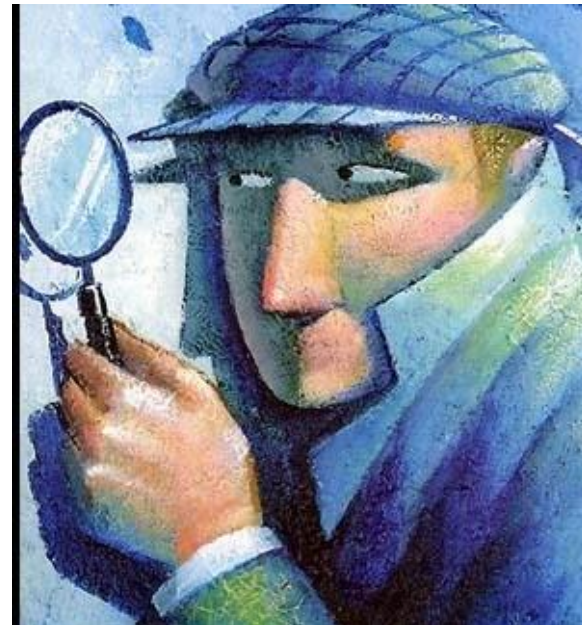
- SSC's specialty
- All phases of project planning, implementation, and testing
- According to clients' specifications
- Focusing on ROI, efficiency, and simplicity



Example of Custom SSC Fraud System



- Processed almost a billion journal entries for accounting firm
- Implemented ETL process to create SAS datasets, which used Grid Computing for maximum efficiency.
- Weighted journal entries according to fraud probability of transaction
- Selected random sample of weighted journal entries to flag for investigation
- Applied software updates as improvements were made
- Developed custom system reporting





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Automated, Efficient, Easy to Use Systems.
You Get Reliable, Meaningful Results!





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