

Paper 152-28

Using SAS® Strategically: A Case Study

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ABSTRACT

Quaker Chemical Corporation is a leader in the application of SAS products to meet global, strategic business goals.

This paper will discuss at a high level how Quaker applies a wide-range of SAS® software including Strategic Performance Management, Total Financial Management, Human Capital Management, AppDev Studio, and Warehouse Manager.

The timeframe for this review will include past and current efforts, as well Quaker's plans for the future.

VISION

According to Tom Baker, Manager, Business Intelligence and Development at Quaker Chemical, "From our strategy on down to our sales to our financials to HR, everywhere in the business that we need to do analytical work, look at information, make business decisions, this is where SAS plays a part within Quaker environments."

QUAKER CHEMICAL CORPORATION

Quaker Chemical is a worldwide developer, producer, and marketer of custom-formulated, chemical specialty products. It is best known for QUINTOLUBRIC®, Quaker's family of specialty, fire-resistant and environmentally compatible hydraulic fluids.

Quaker is also a provider of chemical management services for manufacturers around the globe. In these cases Quaker employees work onsite at client manufacturing locations where they manage all the fluids used at the site.

Quaker Chemical operates primarily in the steel, can and automotive industries. It is headquartered near Philadelphia, PA, has about 1200 employees, has sales in 40 countries and operates in 16 countries. In 2001, annual net sales were about \$250 million on total assets of \$178 million.

Quaker has less than 25 employees in Information Service and less than 4 of these supports SAS systems.

BUSINESS STRATEGY

Quaker's strategy is encapsulated in the company's Destination Statement:

OUR DESTINATION

"A single worldwide company that delivers everywhere the best from anywhere, that creates value in every process we serve, and that every customer will find indispensable. We will be the undisputed leader in the businesses we

choose and will be known for our growth and financial success and as a premier place to work."

Many companies have these kinds of statements but at Quaker Chemical this Destination Statement is taken very seriously.

From a Systems perspective there are some key phrase in this statement:

- "worldwide company" - meaning 'global'. Formerly Quaker was an international company where the business was run by country or region. Today, all business processes are tightly coordinated from a global perspective. For example, Human Resource departments throughout the company report directly to the Global Vice President of Human Resources, and only indirectly to their regional business managers.
- "delivers everywhere the best from anywhere " - Associates at every level must have access to the highest quality information from every available resource. Systems must gather data from diverse and dispersed local systems, and external resources, and be fully integrated with comprehensive corporate systems.
- "creates value" - Computer systems create value by supporting quality decision making, improving internal process and reducing costs.
- 'growth' - Quaker's growth includes acquisitions. Even in the difficult economy of 2002, Quaker acquired two companies. So systems have to be flexible in terms of input file structures and types, and hardware environments.

INFORMATION SERVICES STRATEGY

The strategy of the Information Services department includes these goals:

- To enable Quaker to achieve the goal of becoming a global knowledge driven enterprise
- To provide cost effective solutions to enable growth, operation effectiveness, and cost control
- To provide leadership as a business partner to understand and take advantage of the information economy
- To enable Business Intelligence

Business Intelligence is the information Quaker uses to manage the business, to evaluate performance and make decisions; as well as the method of using information to make decisions, organize actions and manage associates to achieve business strategy.

Business Intelligence is achieved through:

- Analytical applications directed at critical business analysis

- Knowledge management and collaboration of decision makers, process managers, and front line associates
- Financial planning, reporting and analysis
- Performance management via balanced measurements of business process

When an Quaker associate in a country such as Japan solves a problem and records their findings in the Quaker Business Intelligence Collaborative Server, then associates in the U.S., Holland and Brazil can use the knowledge to make improvements for their customers. This is the business advantage to business intelligence.

INFORMATION SERVICES VISION

The Information Services Vision is to empower all associates, anywhere in the world, with easy access to solid data and good tools.

Access is provided via the global, corporate Intranet. And all systems are web based with thin-clients to minimize their impact on the network infrastructure.

Data must be current, accurate, and comprehensive. It needs to be detailed and summarized. Detailed data must be layered so users can drill down to increasing granularity. Summarized data must include key performance indicators (KPI), or metrics, to enable the users to monitor performance and implement timely corrective action, and to realize opportunities where they can take action.

For tools, users need the ability to import and export data in a wide variety of formats. They also need a strong set of analytical, query/reporting and graphical tools.

SOFTWARE REQUIREMENTS

In 1995, Quaker implemented a new transaction system in the U.S. and realized that a report writing tool would be needed for programmers. When SAS was compared to RPG, the existing report writer, SAS was selected.

About this time, SAS/EIS was implemented for some U.S. users to provide additional ad hoc reporting capabilities.

Also at this same time, the U.S. Controller needed a system to consolidate General Ledger systems and produce financial reports. CFO Vision, Hyperion and others were evaluated. CFO Vision was selected. However, it was not implemented for unrelated issues.

A key manager, our current CIO, took these good experiences with SAS to an assignment in Holland.

A need developed in Europe to produce reports and SAS was recommended based on the previous experiences in the U.S.

When the company decided to shift from a regional to a global organization, the existing hardcopy reports were not adequate for reporting to users around the globe. Fortunately, SAS Intranet was introduced about this same time. Quaker hired consultants to create a SAS Intranet

ad hoc reporting system (see the discussion of QWIS below).

Again a need developed to consolidate general ledger systems, but this time in Europe. A Dutch team implemented CFO Vision for Europe. When a new Global Controller came on board, she selected CFO Vision as the corporate consolidation tool and the processing was moved to the U.S.

Over the years, other functionality was needed which was not provided by the U.S. transaction systems. SAS/AF was used to build miscellaneous applications to meet these needs.

In 2001, the company realized the need to consolidate Human Resource data and a system was need to manage the balanced scorecard process. HR Vision and Strategic Vision were selected based on past experiences with SAS.

Today, a key requirement is 'web-based, thin-client' which SAS can provide through several software packages.

Over the years, SAS solutions have met the software and business requirements, and have been instrumental in fulfilling the I.S. vision and strategic destination.

SYSTEM ARCHITECTURE

The three main components of the overall Quaker system architecture are: (1) the transactions system called Quaker One.World (Q1W), (2) a collaborative server called Quaker Business Intelligence (QBI) and (3) SAS. (See Exhibit 1 below).

Actually, at this writing, Quaker has 13 transactions systems around the world. By the end of 2003, most of those systems will be converted into one global transaction system, Quaker One.World, which is a JD Edward One.World® system, as it will be implemented for Quaker. Whether it's one or many transactions systems, the vast majority of Quaker data is entered through these systems. And the transaction system(s) provides the vast majority of data to the SAS systems. This will be described in more detail below.

There's a possibility that once Q1W is implemented, SAS will be feeding some data back to Q1W.

The other non-SAS component, QBI, is from Intraspect Software Inc. Quaker uses this collaborative server to store and make available to all associates business intelligence in the form of text based or image files. It also supports discussion groups on specific topics. One of the balanced scorecard performance indicators (which will be discussed shortly) measures QBI usage to assure that Quaker associates are taking advantage of this critical tool.

SAS can pass files into QBI to be stored. Quaker also sends e-mail messages from SAS programs into QBI, which are then forwarded to groups of associates. For example, messages are sent to convey that SAS

processes worked or failed, and to say that tasks are completed. In these cases, QBI maintains an audit trail of the processes.

SAS Strategic Performance Management can interface with Intraspect's Collaborative Server, but Quaker has not implemented this feature at this time.

Obviously, the rest of this paper will focus on the SAS component of the system architecture. (See Exhibit 2).

SAS

Quaker uses several SAS Intelligence Solutions including SAS Strategic Performance Management (formerly SAS Strategic Vision), Human Capital Management (formerly HR Vision), and Total Financial Management (formerly CFO Vision).

The gray boxes in Exhibit 2 are the Intelligence Solutions. And since they are user interfaces, they are close to the top of the diagram. The white boxes are custom Quaker applications. The Quaker Warehouse Information System, Data Entry/Update Applications, and Custom Applications also have user interfaces to varying degrees. There are no lines in Exhibit 2; since all these systems are SAS systems, potentially, they can all interface with one another.

For custom development, Quaker uses Base SAS, SAS Warehouse Administrator and AppDev Studio. In the past, Quaker also used AF and SCL.

In terms of the systems infrastructure, Quaker uses SAS Connect, Share, ODBC and Intranet.

SAS applications and tools are Quaker's primary information processing tools. Otherwise, Quaker uses a few Microsoft® Access applications and third party, ASP applications. Users use Microsoft® Excel extensively.

COMMON BENEFITS OF SAS INTELLIGENCE SOLUTIONS

The SAS Intelligence Solutions have some common benefits. They can read a wide variety of input formats and sources, can operate across various hardware platforms, have strong query/reporting/analytics, can be web based, have strong graphical capabilities and they can generate various output formats.

BALANCED SCORECARD

In 2001, Quaker's management developed key performance indicators based on the Balanced Scorecard concept. Quaker's KPI are grouped into 4 key areas - financial, customer, internal process, learning and individual growth.

The key benefit of a balanced scorecard is that it documents goals and the progress which the organization is making towards those goals. At the end, of the day, a

scorecard enables users to determine where resources should be focused.

There were some lessons learned during the scorecard implementation. The key one was to 'start off small and grow'. Quaker had good success choosing a few initial measurements, managing them well and allowing them to change over the early stages.

Initially there were some difficulty with the concept of a scorecard and the relationship between the metrics, which was overcome with additional education.

The balanced scorecard initiative is quite significant at Quaker. Training sessions and a pamphlet were provided for all associates. In the 2001 Annual Report, the year-end scorecard was included as a key graphic. And the CEO presents the current scorecard to associates at Quarterly Update Meetings.

STRATEGIC PERFORMANCE MANAGEMENT

The key benefit of the Strategic Performance Management system is that it facilitates communications across the organization by displaying the status of the KPI on a graphical "dashboard".

Since Strategic Performance Management can support the roll up of multiple layers of scorecards, the plan is to have divisions, department and possibly individual associates develop scorecards based on the corporate scorecard. This will enable a tight integration of individual and organizational goals with performance throughout the organization.

And digressing for a moment back to the initial development of the scorecard, Strategic Performance Management 's graphical tools enhanced management's ability to see the relationship between metrics and refine their relationships.

SAS HUMAN CAPITAL MANAGEMENT

For years Quaker struggled with the processes of consolidating diverse global data for the Human Resources department. Human Resource is one area of a company that is difficult to standardize globally due to the various local legal requirements. Human Capital Management has greatly improved this process.

Quaker was an 'early adopter' site for Human Capital Management Version 3.0. Quaker tested the system and submitted suggestions for modifications.

The 10-15 global human resource professionals now have a powerful tool for analysis and reporting at a global level.

Human Capital Management has extensive OLAP functionality and analytics including strong organizational chart and geographical reporting. It is very user friendly and it has a powerful security sub-system, which enables access to be row/column specific.

System Architecture

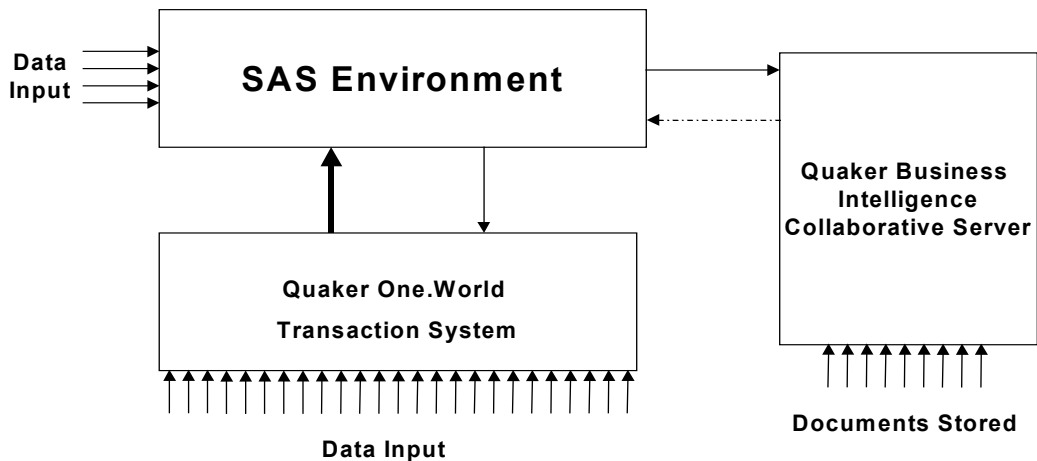


Exhibit 1

SAS Environment

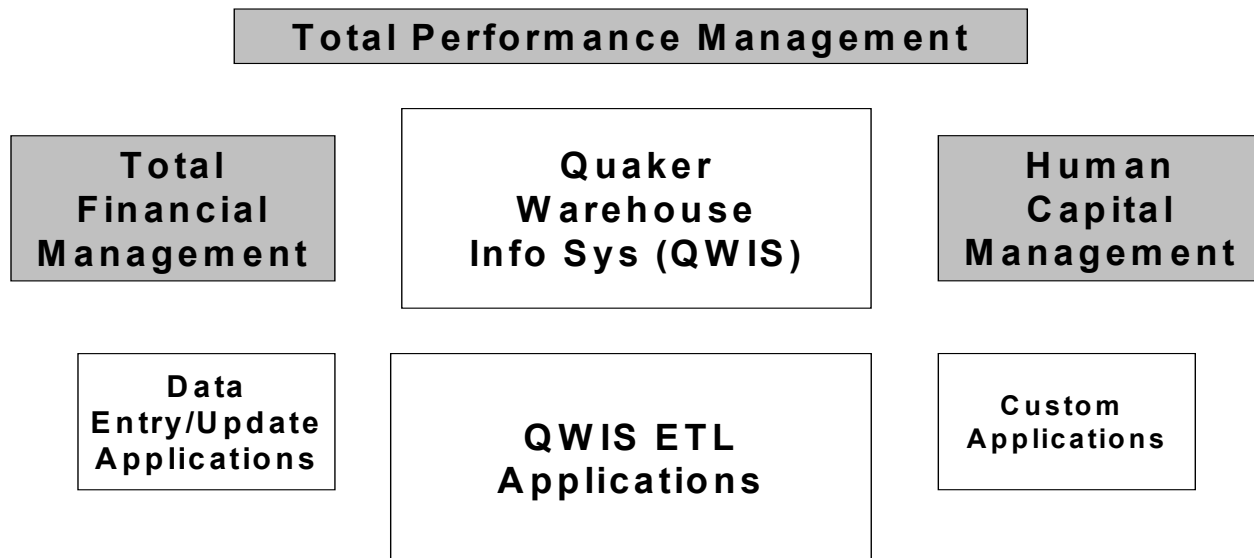


Exhibit 2

Human Capital Management is delivered with Warehouse Administrator built-in, which facilitates developing the unique extract, transform and load for each local file.

Future plans include making the system available to associates throughout the company so they can access data which is relevant to their jobs and using more of the built-in reporting functionality.

SAS TOTAL FINANCIAL MANAGEMENT

In the financial area, Total Financial Management is a critical tool for the Chief Financial Officer and his staff. It provides the functionality to gather the financial data from global affiliates in various formats and currencies, apply journal entries, consolidate the data into the corporate accounting structure, and provide reports in a variety of formats including Microsoft Excel and Adobe® PDF.

For many years, Quaker used more than 10 diverse accounting/financial systems in countries around the world. Preparing the corporate financial reports was a daunting task. Total Financial Management simplifies the task considerably.

Total Financial Management was first implemented in the Holland office (97-98) and then it was recommended for global use. It's now U.S. based.

One Total Financial Management administrator loads the system and consolidates the data each month. She also enters the exchange rates and journal entries. Other global users can log on using an Internet browser to query and download data, and produce reports.

Quaker maintains all financial data since 2001 in a single, 7-dimensional file. This enables extensive analytics.

QUAKER WAREHOUSE INFORMATION SYSTEM

The Quaker Warehouse Information System (QWIS) is the most significant, custom, SAS application at Quaker. As the company moved from an international to a global organization it became important to raise the visibility of data from local/regional to global.

Underlying QWIS are data warehouses and data marts in standard SAS files.

There are currently about 30 data warehouses for many areas of the business, but the most important warehouses contain sales by customer, product line and geography.

At the time this system was written security techniques were limited so access was defined to specific data marts which were subsets of warehouses. Users only have access to data marts. Another reason for data marts is that smaller files have better response times.

Actually, QWIS has two components: a user interface and extract-transform-load (ETL) processes.

The GUI user interface, which was written using SCL and SAS Intrnet, is standard regardless of the data mart so it

does not have to be updated as data marts are added. The fields which are used to subset the data and the fields which can be displayed, are all loaded into the display dynamically based on metadata.

QWIS provides the users with extensive ad hoc query and reporting capabilities. In addition, programmers write more advance reports.

Output from QWIS can be generated in HTML, Microsoft Excel or a text file.

While Quaker is currently undergoing a major transition to the single Quaker One.World transaction system in the past there were numerous, diverse transaction systems. The QWIS ETL processes were the keys to merging and transforming that data into a coherent global data for corporate decision support.

The original system was written in 1998. Base SAS was used to extract data from the transaction systems, transform it and load it into data warehouses. Today, some of the ETL processes have been rewritten using SAS Warehouse Administrator.

To be as real-time as possible, all the transaction data for QWIS data warehouses is copied to SAS every night. Depending on the business requirements, warehouses and data marts are rebuilt either daily or monthly.

These are some of the more significant ETL systems for specific data warehouses:

- Sales and Margin Analysis System for analyzing customer, products, segments and industries.
- Worldwide Spend for analyzing critical raw material, finding the best prices and the best purchase approaches. Enables buyers to consider the best price on a global basis instead on national or regional.
- Raw Material for analyzing impact of raw material price changes on corporation bottom line.
- Expense Tracking for analyzing associate travel and entertainment expenses.

Quaker has started to see the need for additional functionality in QWIS and so there are plans to enhance QWIS using AppDev Studio, SAS Version 9 Business Intelligence Platform or software from a SAS partner.

QUAKER ONE.WORLD TRANSACTION SYSTEM

Q1W has already been adequately discussed.

But to clarify, transaction processing at Quaker includes the traditional business processes of order entry, accounting, logistics, laboratories, manufacturing, purchasing, etc. At Quaker it does not include human resources or payroll.

SAS WAREHOUSE ADMINISTRATOR

The primary use for the Warehouse Administrator at Quaker is to perform the ETL function as data moves from transaction systems to the SAS data warehouses.

Warehouse Administrator takes development beyond coding and provides an analytical tool. It documents systems development by creating a data dictionary of all the system components and by automatically adding comments as code is generated. When a change is needed, Warehouse Administrator enables the programmer to see the impact of a change, across all systems, before the change is made.

The GUI interface simplifies coding and enables programmers to easily navigate the logic and relationships of the system.

BASE SAS

Base SAS is of course the foundation to all other SAS components and systems.

DATA ENTRY/UPDATE APPLICATIONS

Quaker does not have a big need for data entry/update applications since so much of the data is entered in transaction systems or provided in Excel and text files.

However, enhancements were made to QWIS to provide screens to maintain files. This was written in SCL and SAS/Intranet.

Another application enables the Travel and Entertainment Administrator to maintain some files. It is a base SAS program which generates dynamic HTML code and displays it through SAS Intranet.

Quaker plans to move to SAS AppDev Studio for all future development in this area. There's a need to do thin-client development and to keep up with the technological direction that SAS is taking. At this writing the Quaker development team is taking related classes and no projects have been initiated.

CUSTOM APPLICATIONS

Historically, along with AF, EIS and Graph, Quaker used base SAS to fill in functional holes in legacy transaction systems.

For example, in the U.S, Quaker currently has a separate order entry, transaction system and a general ledger system. A SAS system written with SAS/AF and base SAS is used at the close of each month to read data from both systems and insure that they are in balance.

Another SAS system was written with SAS/AF and base SAS and is used to calculate commissions for sales reps. It reads data from the order entry and general ledger systems, and passes the results on to the payroll system.

By the way, the order entry and general ledger systems are on an AS/400 and the payroll system is on a standalone PC.

SAS INFRASTRUCTURE

Q1W resides on an IBM AS/400. All the other systems reside on Windows NT or Microsoft 2000 servers, or PCs.

Quaker has outsourced its global data center to a firm in the Netherlands and maintains a few servers in the U.S.

Quaker uses SAS Connect, Intranet, and Share to drive its Intranet and SAS ODBC to read data from the AS/400.

THE TEAM

Quaker employs an in-house team of 4 to design, build and maintain their SAS environment. Consultants are hired as need to supplement the staff (see paper by John Dennis).

THE FUTURE

Quaker Chemical will continue to focus on web enablement because web-based systems can be accessed from anywhere in the world.

The development team at Quaker has decided that all new custom SAS development at Quaker will be done using AppDev Studio, JSP and Java. XML and OLAP will also be key technologies going forward. Unfortunately, no projects were initiated in time for this paper.

Quaker will also be looking to take more advantage of the features of the SAS Intelligence Solutions and the Version 9 and 9.1 upgrades.

And finally, Quaker will continue to seek opportunities to add data warehouses to QWIS to support business decision making.

CONCLUSION

Quaker Chemical Corp. is one example of a company that is using SAS software extensively to drive its strategy to "deliver everywhere the best from anywhere" and create "value".

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DISCLAIMER:

All opinions stated are the opinions of the author and may not reflect the opinions or intent of the SAS Institute.

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