Lazysoft technology

Johnson Matthey

Sentences™ Case Study

Johnson Matthey plc – First Deployment

This case study describes the experiences of Johnson Matthey, a speciality chemicals company, with Sentences, a new database product from Lazysoft, a British software company founded by the team responsible for the success of Synon as the dominant vendor of application development tools for IBM's iSeries AS/400 platform.

Background

Johnson Matthey is focussed on precious metals, catalysts and other fine chemicals and is a world leader in advanced materials technology. It is organised into three operating divisions: Precious Metals, Catalysts & Chemicals and Colours & Coatings. The group's principal activities are the manufacture of catalysts and pollution control systems, pharmaceutical compounds, process catalysts and speciality chemicals; the refining, fabrication and marketing of precious metals; and the manufacture of colours and coatings for the ceramic, glass, paint and plastics industries. It is a global organisation with sixteen Business Units operating from nearly 50 sites, operating in 34 companies and employing around 6,500 people. Many sites host activities of more than one Business Unit and the IT infrastructure is highly distributed, allowing resources to be shared between Sites, Business Units and Divisions. Such a complex environment can realise economies of scale – but requires sophisticated management for effective change and impact control.

The company has recognised that the Y2K issue was an opportunity to improve management and control, as well as an annoying legacy problem. In particular, the Y2K audit database of company IT assets is seen as an asset in itself, if it can be exploited successfully, and the company has identified a business need for effective resource management, managed through feedback mechanisms driven by business users, which could be satisfied by utilising this potential asset. However, there are also technical constraints: a distributed, global, solution is necessary, and one that doesn't have a significant impact on existing automated processes. The cost of any resource management solution is also an issue as the asset database is one level removed from the core business processes that are the normal concern of IT – resource management is of benefit to the business but it is not fundamental to the business itself, nor is it an immediate income generator.

Data Rich, Information Poor

In fact, before Johnson Matthey discovered Sentences from Lazysoft, it found itself in the position of many "data rich, information poor" companies – it knew it had a valuable potential asset, but the cost of converting this potential data asset into an effective information asset might outweigh the benefits obtained, especially using conventional RDBMS (Relational Database Management System) technology. There are plenty of stories (chiefly from software vendors) of decision support systems delivering an impressive return on investment but there are also many reports of data warehouse and decision support systems that never get finished or never deliver in the medium/long term on their initial promise. Lazysoft's Sentences application development facility, which is based on a DBMS (Database Management System) using the innovative Associative Model of Data™, can help. The key to building effective decision support or data warehousing systems is the quality of the initial data analysis and the primary selling point for Sentences is its real-world modelling of data, although it is also inherently suited for distributed applications. The system Johnson Matthey wants has to add value to the existing IT and corporate process at Johnson Matthey - not impose itself upon it. The potential of a database solution applied to a high-level process such as IT resource management is clear but more important, in practice, is the immediate ability of Sentences to deliver answers to questions like:

- *"Who will be affected by downtime of this system?"*
- *"Who is still using the previous version of this software?" and,*
- *"Why are we running so many installations of this product?"*

using only the Explorer tool, which is part of Sentences. However, Sentences is no silver bullet and it is important not to trivialise the issues. As Einstein pointed out, we need solutions that are as simple as possible but no simpler, and some initial effort, commensurate with the complexity and size of the real world problem, has to be put into data analysis in order to achieve the benefits of Sentences. However, this may not be as great an overhead as might be

expected, since the Associative Model of Data, on which Sentences relies, matches the real world more closely than alternative models.

The Restrictions of RDBMS

Nevertheless, as Dennis Wildish, Senior Analyst on the project, from Johnson Matthey Precious Metals Division (PMD) observes, the conventional Relational Database Management System (RDBMS) mind-set is difficult to escape from: *"RDBMS has been synonymous with 'database' for so long that the restrictions of RDBMS dominate the data modeller's outlook – and the principles of the Associative Model are new and radically different."* As Wildish goes on to say, *"It is difficult even to find texts on data modelling which do not introduce the limitations of the relational model as if they are fundamental to data modelling itself. When you use Sentences, you can see that they aren't. Sentences is so easy to use that databases can be created 'on the fly'". "This is brilliant,"* he continues, *"but the application context hasn't changed. To create significant systems it is still essential to understand the fine detail of the application domain – and to ensure that your data model reflects it. Then the Associative Model's new capabilities have to be understood in order to be applied. The absence of 'handle-turning' processes for this model could be perturbing.*

But then you realise that the tool can genuinely model the real world. The technological restrictions, so familiar from use of Relational databases, have gone. Associative technology frees the IT data model to directly represent the business process: the gap between business model and database implement-ation has been dramatically closed."

In other words, the Associative Model can't make hard problems into trivial ones, but it can ensure that designing your database is no more complex than is necessary given the complexity inherent in the real world problem. After the initial learning curve has been surmounted, developers can devote their intelligence to dealing with the politics, ambiguity and complexity of the business process being automated, rather than the complexity of a DBMS based on a mathematical abstraction – surely, a more productive use of their skills?

The Johnson Matthey Story In Detail

In July 1999 Simon Haigh and Andy Newton of Lazysoft presented Sentences 0.2.x to Stephen Way, I.T. Manager, Johnson Matthey Precious Metals Division (PMD), Dennis Wildish, Senior Analyst, PMD and Adrian Howard, Programmer, PMD. Unknown to Lazy, Johnson Matthey was progressing towards completion of an audit of its IT systems for Y2K with Way in a key role. The audit was clearly creating an unrivalled snapshot of all Johnson Matthey's IT systems and Way was looking for a means to realise added value from this opportunity but had not found a suitable tool to manage the data. Within 15 minutes of seeing Sentences demonstrated, these two strands had come together as the basis for the Sentences beta project at Johnson Matthey. During August, Andy and Howard installed and tested a number of pre-Beta versions of Sentences at Johnson Matthey. A number of teething problems were found and resolved as a result – part of the essential value of co-operative development of a new product in an "early adopter" user site.

By September, the scope and objectives of the project could be clarified. The project is to create a system where high-value information on the detail of Johnson Matthey's complex IT infrastructure can be stored, retrieved and queried to improve the quality and efficiency of IT administration and planning. The initial data source is the Y2K infrastructure audit responses. Note, however, that it was never intended that the Sentences project should contribute to the Y2K compliance project directly. The initial audit data exists primarily as questionnaire responses - which require a degree of informed interpretation, ideally suited to the Dataform facility in Sentences. The data also needs to be kept current, and the team decided that the best way to achieve this is to make the users who benefit from the system responsible for maintaining it.

Running on Johnson Matthey's Intranet, across its 50+ IT sites in 25 countries, Sentences will not only be able to support end-user data access, but also this more challenging requirement for end-user data maintenance – and all via the same automatically generated GUI (Graphical User Interface) forms.

The first beta release of Sentences was installed at Johnson Matthey in October and Wildish joined the team, bringing greater experience of database and data modelling, including experience with Obsydian. Wildish observed that, as with Obsydian, the data-modelling phase was crucial to success with Sentences. The ease of use of the interface made database creation almost too easy. However it also made schema development by iteration a practical option, which allows all involved to learn about the capabilities of the model and of the tool in a very active, and therefore effective, manner. In addition, with each schema iteration a little more data could be added and the system functionality explored further, before feeding this back into the application development process.

November saw the most active phase of schema development. The scope of the project was expanded, so that it could act as an information source on the availability and application of valuable IT resources for all purposes and for all sectors of the Johnson Matthey group. This involved extending the schema to represent the physical and logical structure of the Johnson Matthey organisation as a whole:

- Divisions containing Business Units based at Sites;
- Human resources (Person, Job Title, Email Address, Contact Number etc.);

- Physical resources (Hardware Units, Platform types and machine Models);
- Software implemented (Software at Versions) and the associations between software installations (e.g. (Business Unit, based at, Site), uses, (Hardware Unit, runs, (Software, at, Version))).

The first queries are added to the system in December, a mere two months after the first usable version of the product was installed. Sentences now supports a powerful Query mechanism and this is used to define, store and execute queries against the database, e.g. for data analysis and summarisation. An example is the parameterised query 'Users of software':

- Double-clicking on a parameter field allows it to be set to any of the 95 software product installations recorded in the database;
- Executing the query returns a list of business units using the product, complete with installed version number.

The first important milestone review (attended by management from both Johnson Matthey and Lazysoft) took place in mid December. The response from both management and technical staff at Johnson Matthey was highly encouraging. The Associative Model is a significant departure from previous database technology at Johnson Matthey but its value, in escaping the limitations of RDBMS, can be rapidly appreciated and, using Sentences, easily realised. Even at this early stage Sentences has proven robust and highly usable and it is decided that the project should continue, albeit after several months lying fallow while both Johnson Matthey and Lazy address other priorities. However, during this period Lazy delivers the first User Guide for Sentences (allowing Johnson Matthey to develop its own queries) and some further prototype systems are demonstrated.

In April the first pre-release version of Sentences v1.0 is made available and installed for Johnson Matthey. This is the first version to use a Java Servlet architecture, which replaces the RMI client-server connection used during earlier development. Johnson Matthey installs the system with the open-source Apache 'Tomcat' web server (supplied with Sentences), which allows the Sentences databases to reside on any server allowed to source HTML page for the users of the system, for access from any standard web-browser.

Early adopters of new software before public "general availability" release must expect teething problems and during April 2000 Johnson Matthey encounters two problems with Sun's Java implementation – concerning cursor re-painting and database access via a proxy server. Workarounds are found and complete solutions are promised by Sun for the Java 1.3 release. At the end of the month the Johnson Matthey IT group demonstrates the system to its senior management for the first time. Johnson Matthey's management are sufficiently impressed to agree to Johnson Matthey's participation in the marketing of Sentences.

In June, and without further assistance from Lazy staff, the Johnson Matthey IT group is able to demonstrate the new system to its senior management again, but now running between different sites – a true distributed implementation. The Sentences server runs on a PC at Johnson Matthey's Hatton Garden, London, offices and can be accessed by a client running at their corporate offices in Trafalgar Square, using a VPN-style secure connection over the Internet, as used for the rest of Johnson Matthey's Intranet. Shortly after its availability, Johnson Matthey signs up as the first customer for Sentences V1.0 and its intention is to take its IT Resources system live via its multi-site Intranet in the near future.

Summary

The successful IT practitioner is a curious blend of fashion victim and Luddite conservative. He or she is employed to deliver business benefit to cynical users - who really can't see much point in paying anyone who isn't actively involved in selling something to a customer. This leads to two conflicting pulls:

- New technology is inherently attractive, because it promises to deliver new business benefits to new areas of the business and keep everyone in IT employed.
- On the other hand, experience quickly teaches that there is a lot of truth in the old adage "if it ain't broke, don't fix it". Users will get very enthusiastic about new fashionable technologies but what they really care about in reality is that their technology isn't significantly broken when they need it.

Industry marketeers have exploited this and are adept at packaging old wine in new bottles (or old ideas in new jargon) in order to deliver apparently new business benefits. At the same time they avoid giving any hint that you might be putting a working business system at risk by tinkering with it. Software is often marketed as a risk-free silver bullet, which can instantly replace your bothersome legacy technology with a perfect omni-competent solution to the business' needs at very little cost. So, given this, why would an experienced (read cynical) IT manager want to replace the tried-and-tested (and mathematically founded) RDBMS model with the Associative Model of Data and products based on it?

Well, the Associative Model is genuinely new, rather than a repackaging of old ideas, and is based on a published conceptual model. Simon Williams has, unusually perhaps, chosen to publish a book on the conceptual model behind Sentences in advance of marketing the Associative Model and products based on it. This includes a critical comparison with other approaches; so you can find the best database or data analysis expert you have and then have them evaluate

the theoretical underpinnings of this innovation before purchase.

Sentences does, in reality, handle things that RDBMS-based solutions don't handle well:

- Nowhere in the conceptual model of the Associative Model is it mandated that associated entities must reside on the same server. Sentences is inherently enabled for distributed computing
- Time series and archival data are handled routinely, in contrast with an RDBMS which can only handle one occurrence of an entity (usually the latest) without special programming
- Data analysis can be utilised directly in the database design; there is no need for extensive manipulation (such as relational-model normalisation) before it can be used

Johnson Matthey's involvement with Sentences in its early adopter program is particularly valuable as a "proof of concept" in a real-world environment. Whatever the theoretical justification for the Associative Model it won't be commercially successful unless it can deliver demonstrable business benefits in the hands of hardworking IT professionals. The Johnson Matthey experience shows that the Associative Model of Data implemented in Sentences can do this.

Butler Group

In April 2000 the Butler Group completed a glowing Technology Audit of Sentences, acknowledging its innovative nature by creating the new product category *"Data-Focused Application Development"* to describe it. Butler sees Sentences as a combination of Application Development Environment and DBMS and comments that the advantages of partitioning applications into business logic and database layers, now common practice, could be increased if the underlying database schema could be more transparent to the application, something that Sentences largely achieves.

The Butler report notes *"currently, achieving this transparency, or removing the inter-relationship between application and database, is impossible given the constraints of the Relational Database Management Systems in use throughout most organisations"*. This is independent verification that the ubiquitous RDBMS model does have limitations in practice, a view that underlies, and justifies, the development of the Associative Model of Data.

Butler Group goes on to say *"Those organisations that took on board the relational model from an early stage were able to gain some large measure of competitive advantage both in terms of pure data management and with respect to developing powerful business-based applications. Butler Group believes that the new data model proposed by Lazysoft could also have a similar impact for early adopters."*

It concludes *"Butler Group believes that Sentences from Lazysoft is a solution that the market has been waiting for; even though the market may not have realised the fact."*

In May Sentences was test marketed to an audience of IT and management staff from the ASP community at one of the Butler Group's 'Butler Briefings', with participation from Johnson Matthey. The Johnson Matthey model was demonstrated and its staff answered questions from the audience on the Lazy stand. The general reaction on this early exposure to the product was very positive. Nevertheless, Sentences is still evolving and in its report Butler identifies several future directions for Sentences including finer-grained security (currently implemented by access control at the profile level) and synchronisation facilities for casually connected (eg. mobile) users. Lazysoft is working on these areas for future releases of the product.

The Sentences Butler Group Technology Audit can be viewed online at ***www.lazysoft.com***.