Data Warehousing in Insurance: Can it Work?

Information flows in insurance operations are very complex. A data warehouse can help manage this complexity.

By Peter Rousmaniere and Sass Babayan. This article was published in *Risk and Insurance,* September 1st, 2001.

For the past decade risk and insurance executives, computer engineers, and consultants have promoted data warehousing as a means to improve business decisions. Hartford, Conn.-based Conning & Company, however, a respected voice in risk and insurance, reported last year that the vast majority of data warehouse projects among insurance companies fail. Is it worth the risk?

A data warehouse is an information technology investment specifically designed to bring information from one or many sources into conformity, retain it at the most detailed desired level, hold it in readiness for inquiries on demand, and assist the user in making inquiries. In the complex world of risk and insurance operations today, the only viable means of obtaining feedback on the success of an enterprise may be a dedicated collection, storage, and inquiry system.

The secret: in designing a warehouse, focus religiously on what is absolutely required to measure success of operations. But there's a catch: performance flows outward from the smallest event to affect many departments, customers, and suppliers. A data warehouse's ultimate role is to focus the enterprise on core priorities. These are profitability and markets for insurers and, for corporations, lowering the cost of risk.

We conjecture that in the United States upwards of 2,000 property and casualty carrier home offices and corporations have sufficient insurance business or exposures to warrant an investment in risk and insurance data analytics such as a data warehouse. (For corporations, absence management is included.) It appears that many have tried, but more than half deferred or abandoned their data warehouse projects.

The high failure rate reflects some problems that are hard but not impossible to overcome, such as poor data in legacy transaction systems. On the other hand, design is better understood. We focus below on what has been learned.

Struggle for Insights

When risk and insurance professionals think about a data warehouse, often they have in mind a garage stuffed with dead facts. They should in fact be thinking about a business meeting of insiders and outside parties urgently talking about different information needs to meet their business goals. Let's listen in on some of these conversations.

Jay Ayala, chief operating officer of Octagon Risk Services (a division of St. Paul in St. Paul, Minn.), finds that "clients increasingly want access to the claims system. We have had to identify claims systems that serve our clients as effectively as our own claims staff. We make online claim documentation a priority, because clients expect access to claims status." Ayala wants to satisfy his clients' hunger to find out where claims are heading.

Dr. Michael Hodgson and Arnie Bierenbaum oversee occupational injuries and illnesses within the Veterans Hospital Administration system. All incidents represent important events to be prevented. VHA wants to track the impact of prevention programs on frequency of incidents and disability. VHA is sensitive to findings by occupational researchers that the majority of work-related conditions may never show up on claims files. They aim to learn from all adverse events.

Frank Campolo, who works for Norkom, a company in Boston tat markets a customer relationship management tool to American insurers, helping them discover from policyholder, claims and marketing data (maybe foreign to the insurer) pockets of high-profit sales opportunities. Campolo wants his clients to constantly harvest the past to rapidly deploy new sales campaigns.

Fred Scardalette, VP for disability products and marketing at Philadelphia-based Intracorp, wants to produce a wide array of performance reports for internal management and clients. Some reports require the firm to retain a series of monthly data snapshots that recreate the past.

Carl Wilson, director of marketing and underwriting for Oregon's largest workers' compensation carrier, SAIF in Salem, Ore., is intent on giving his underwriting staff automatic pricing tools at renewal. These tools need to be very sensitive to loss trends.

What do these vignettes tell us? Each involves an inquiry about core performance - retrospective, concurrent, or prospective. Either at the surface or lurking just below are the questions: "How are we doing?" "How do we compare?" "What could we be doing better?" They ask what happened to their plan; leverage past patterns into future plans; and compare an individual exposure, claim or policy, even as it evolves, to benchmarks and experience. A data warehouse is an electronic portrait of an enterprise's performance.

A data warehouse may or may not be appropriate for any particular organization. (Intracorp and SAIF built data warehouses and are very happy with them.) Yet, risk and insurance is replete with jobs in which inadequate analysis of performance is the norm.

Nydia Koenig runs the statewide occupational medicine network, OMNET, of the Louisiana Workers' Compensation Corp. in Baton Rouge, La., the state's largest workers' comp carrier. Koenig has tried various ways to analyze the performance of the medical provider network. She looks at data coming from claims, medical bill review, and pharmacy systems. None of these systems are more than 10 years old, the IT department of the carrier is well-staffed, but the information is not adequately integrated. Reports are difficult to create ad hoc. She feels often she is flying blind.

A claims system used by adjusters is very likely not to provide a perfect data match with a policy management, case management, medical bill review or litigation system owned and operated by yet another party. Corporate safety and health information systems are likely to have different incident and action codes than the human resources and disability claims system used by the very same corporation.

Operating data have become easier to collect electronically and can be deployed to an expanding number of users. The pace picked up in the 1990s and continues. As data accumulate and systems change, the path to business insights steepens. We seem to be getting dumber faster than our databases are getting bigger.

To be sure, the exertion of our minds, not that of a computer, is what ultimately counts. For example, like other risk managers, Al Sulak of Snap-on Inc. in Kenosha, Wis., relies on intuition and personal style whether to assess the motives of a claimant or to advise his colleagues. Nonetheless, we are more dependent by the year on computer inquiries to score and reshape how we work.

The Case For

So why build a data warehouse? Almost all application programs include inquiry tools, and there is a strong market for dedicated inquiry and report software. Crystal Reports and Business Objects are example of popular tools to do database inquiries. Some analytic software such as Marsh's STARS program is sold expressly for inquiries into risk and insurance databases. Mike Rhyner of The Connecticut Interlocal Risk Management Association in New Haven, Conn., has tested generic report generators against his databases (he does not have a data warehouse) and finds them useful yet beyond the skills of most potential users, including his municipal pool's customers.

A data warehouse greatly eases and expands the process of inquiry. Analysis can go to deeper layers than before. This is what brought Intracorp and SAIF to the decision to

build their data warehouses. The killer argument is that senior executives can select and direct how management and customers measure performance, across the enterprise.

The following hypothetical case study of a workers' compensation insurer reveals the steps in building a data warehouse.

We asked Deborah Kweller, chief operating officer of Innovative Care Systems, of Torrence, Calif., to outline the salient milestones in a workers' compensation claim, managed as part of an integrated disability management program.

She served up a claim with the following milestones. Day 1, employee files claim for back injury and convalesces at home. Day 3, claim is still pending and employee goes on sick leave, retroactively. Day 14, workers' compensation claim is paid. Day 65, back surgery is performed. Day 80, employee returns to work on modified duty. Day 100, employee returns to full duty. Day 101, claim is closed by claims staff.

The first question to ask is, who shall decide how to measure this claim's performance? Our first impulse may be to regard this flow of events as owned by a claims department, therefore to be documented and analyzed by it on behalf of the entity.

However plausible, this approach is flawed. The most important claims analysis within an insurer takes place outside of the claims department. Claims data are vital for correct pricing of premiums. This is especially the case in a hard market, at a time when the cost of insurance is both rising and heavily impacted by deductibles, other loss-sensitive factors and program business guidelines. This broader view of claims reflects what Scardalette of Intracorp says is essential for data warehouse success: broad business unit involvement, and an "enterprise data management discipline." SAIF's computer-assisted pricing system for small accounts was designed from experience with data warehoused claims and policy data.

Some events of this claim, as profiled by Kweller (an expert in integrated disability management), occur at the worksite: the brief use of the company's sick leave benefits, and the modified duty episode. According to Kweller, companies are wont to record sick leave and reduced workloads in idiosyncratic ways.

We find it is important to undertake the following steps:

1.   Create a unified, multifunctional view of the enterprise, starting with performance expectations of all stakeholders (including customers and suppliers). Define how these expectations intersect with data flows. Create common data definitions.

2. Only after the first step is completed, focus on the designs and definitions used in the databases that will contribute to the data warehouse. Construct the paths by which data will be loaded into the data warehouse.

3. Then address the process by which inquiries will be made of the data warehouse.

After the first two steps are completed, the project team will incur little or no unpleasant surprises when it plans detailed inquiry protocols. For the above claim, these can include alerting the claims adjuster as to the probability of the claim being reinstated if she or he initially denies it.

Also, the medical management staff of the insurer can receive a report on surgical utilization by diagnosis, profile of claimant, etc. The insured company can obtain a profile of disability duration and claims cost, the report data readied to fit into the company's broader database of absences and reduced workdays. The insurer's underwriting team in preparing for renewal can obtain a report on the performance of the insured in timely reporting, use of modified duty, and other factors that could affect pricing and credits.

Each of the five cases cited (Ayala, VA, Campolo, Scardalette, and Wilson) are valid candidates for data warehousing. Two in fact had built data warehouses.

We can now rephrase the design requirement in more formal language. The project plan is to minimize disruption to the organization. Industry-accepted software engineering tools should be used. The design project should address multiple lines of risk or insurance and plan for future expansion.

A performance benchmark section needs to be created and refreshed periodically. Benchmarks are derived by evaluating past performance and from outside parties. For workers' compensation, these parties can include the Workers' Compensation Research Institute, Work Loss Data Institute, and a treatment protocol provider.

All reporting data is to be compiled into one logical and normalized database. Ensure initially that currently desired reports can be produced. Map the transfer of data from the transaction systems. Provide placeholders for future expansion. Arrange for a report generator to work upon this database. Arrange for proactive reports to aid in the management of individual claims and policies. Organize the database with benchmarks in such a way to ensure fast response to inquiries. (A preferred solution is a so-called star schema). Create subject-matter data marts to ease the inquiry process.

To achieve the best results for a data warehouse, we maintain that it is critical to include both flexibility and expansion capability to adapt as your needs grow.

Peter Rousmaniere is senior consultant at Work Loss Data Institute in Corpus Christi, Texas. He can be reached at pfr@rousmaniere.com. Sass Babayan is principal at WynTec LLC in Dallas and can be reached at sassb@wyntec.com.