BKK Bundesverband is the German national association of company health insurance funds. Its 175 members are independent, nonprofit corporations that insure nearly 14 million people, providing almost 20% of the statutory health insurance market—the federally mandated, state-regulated and employer-sponsored coverage in which most full-time workers are required to participate. Each of these organizations is legally responsible for performing certain tasks, such as treating illness, providing medical rehabilitation and paying sickness benefits. Although many were formed to insure the workers of a single large employer, most now offer open enrollment. In 2005, BKK affiliates provided member benefits worth more than 23.4 billion euros.

As the umbrella organization for these carriers, BKK seeks to help affiliate companies deliver optimal member services at affordable prices and grow membership, which enables them to further increase negotiating power, drive volume discounts and reduce member premiums. In pursuit of these goals, BKK represents affiliate interests before government policymakers, negotiates contracts with healthcare service providers and provides centralized services designed to make insurers more efficient, effective and competitive. Perhaps the most
important of these centralized services is a clearinghouse that provides electronic claims settlement and an enterprise data warehouse (EDW) that provides reporting and analytical services based on comprehensive claims history.

Building a foundation on business analytics
Both the central claims exchange and data warehouse for BKK were launched in the mid-1990s in response to legislation requiring electronic processing of all healthcare settlements. Since the settlement clearinghouse would bring together claims information from care providers across Germany, BKK seized the opportunity to consolidate this information in a data warehouse that would provide centralized reporting and business analytics.

“With millions of policies in hundreds of businesses across Germany, we were undertaking an endeavor of major proportions,” recalls Harmut Scholz, CIO. “We decided to implement a system that would not only give us the ability to capture and store the massive amounts of data we gathered daily, but also provide us with analytical insights that would help us improve member service and increase market share.”

In selecting a technology partner for its data warehouse, BKK conducted a series of benchmark tests that included large-volume data loads, standard query response and a special set of ad hoc queries that were run with no system pre-tuning. Teradata outperformed all competitors in every comparison and was selected based on its proven performance superiority, scalability and significantly lower administrative costs. The first phase of BKK InfoNet, the firm’s new EDW business intelligence (BI) infrastructure, went live in 1997 after an implementation process that required just four months.

Initial users included physician and pharmacy specialists within BKK and more than 180 affiliate analysts. Users could access a variety of standard reports and submit their own complex ad hoc queries. Early applications included provider analysis to identify physicians and care facilities with higher success rates on particular diseases and conditions, as well as the evaluation of brand name versus generic drugs. Affiliates were able to benchmark their performance against their peers and analyze areas of variance. Over a four-year period, the performance improvements and cost reductions made possible by BKK InfoNet helped bring in 2 million additional BKK members—a 38% increase in affiliate membership.

Treating a chronic condition
Inevitably, as better data drove new business gains, demand increased for new applications, wider access and additional data, especially timelier data. Load frequencies increased from monthly and weekly to daily, particularly for large hospitals and pharmacies. In 2005, BKK began planning a system upgrade to accommodate a variety of active workloads, including a Web-based interface designed to expand InfoNet access to a significantly wider user base. In designing the upgrade, BKK was determined to address a chronic operational problem that afflicted nearly all of its affiliates: a lack of visibility into the expense pipeline caused by latency in the claims data available to insurers.

The source of the problem lay in the German statutory healthcare system, which creates a web of interactions among patients, their insurance companies, the association of participating physicians—known as the KV—and the contracted care providers. Doctors send their bills to the KV, which passes them to the insurer for payment via BKK. Insurers pay the KV a negotiated per-member fee to cover treatment, and the KV distributes funds to care providers based on the treatment’s complexity. This arrangement provides limited visibility for all parties about treatment, costs and patient outcomes.

With its position in the middle of the claims data exchange, BKK was ideally situated to provide all interested parties with a more timely view into the treatment decisions that drive costs. First, however, it would need to address two critical considerations: the security of patient and insurer data in a more widely accessible environment, and the ability of the data warehouse to manage a much more spontaneous mix of scheduled and active workloads.

BKK InfoNet gets active
Data protection was addressed by implementing multi-layer security within the data warehouse based on BKK-specific view layers and metadata structures. Users from each insurer can access detailed information on their own members. Other member data is available for analysis with all identification stripped for privacy and security.

Preparing the data warehouse for large-scale mixed workloads was more involved and required several operational adaptations, beginning with data loads. Originally, most data was delivered in a small number of large files containing detailed claim information. Acquiring
that data in a timelier manner required the ability to process up to 100,000 files daily, sent from the healthcare providers in near real time. This, in turn, required dramatic reductions in the overhead per document. Very challenging set logic had to be built around existing load utilities to create “one file at a time” logic that satisfied the applicable legal standards while minimizing processing overhead and optimizing throughput.

Cognos ReportNet, which simplifies the creation and dashboard delivery of BI reports using a Web services architecture. The site provides access to a wider variety of users, each with unique requirements. Business users in the regional associations review data on providers or treatments. Call center agents utilize the data to help chronically ill members manage their conditions. Consulting companies leverage the data to determine the most appropriate facility for customer treatment. While the new infrastructure has enabled additional active applications, these five have produced particularly impressive beneficial impacts on costs, quality of treatment and affiliate service levels:

**Hospitalization case notifications**
Whenever a BKK affiliate member is hospitalized, the hospital sends admission and treatment notifications to the BKK clearinghouse on an intra-day basis. BKK simultaneously loads each one into the data warehouse and alerts the insurer, providing near real-time notification of the hospitalization, the member’s identity and the type of illness or injury incurred. The insurer’s analysts can then retrieve accurate, timely information from the data warehouse, allowing the firm to participate in treatment decisions, ensure optimum care quality and effectively manage costs. This process is particularly important in cases where significant illness or injury may generate large claims.

For example, after a patient is treated for coronary heart disease, it is very important to transfer the patient directly to an appropriate rehabilitation center. BKK can now detect this situation, provide a referral and even reserve a place at an appropriately equipped and conveniently located facility.

**Web-based member information access**
BKK InfoNet also empowers affiliate members with near real-time access to more than two years of their own claims history. Insurance companies are required by law to grant member access to personal claims records, but enabling online access has great value for both the insured and the insurer. It ends the need to supply paper records in response to member requests, eliminating a significant administrative cost. And allowing members to conveniently review the
services and treatments that medical practitioners and hospitals indicate they have provided helps identify mistakes, uncover fraud, reduce costs and drive down premium rates. BKK affiliates provide Web-based software that their members can use to directly access the InfoNet data warehouse with reliable sub-minute service levels.

**Medical equipment and service referrals**
When appropriate, physicians will sometimes prescribe a variety of aids and remedies ranging from durable medical equipment such as wheelchairs to inpatient treatment at a suitable rehabilitation facility. Plan members with such a prescription will then contact their insurer for referral to the best sources of the specified aids or services. A representative at the insurance company can now access the data warehouse and, in near real time, identify the preferred vendors based on proximity, price, quality and service.

The referral service benefits both the insurer’s members and the insurer. Members receive the best selection and price from vendors that are conveniently located. The insurer exercises cost control, reduces contribution rates and improves member satisfaction, which can increase retention. Additionally, controlled and documented referral histories strengthen the insurer’s position in subsequent contract negotiations. The near real-time service level is important, because delayed responses would cause members to look elsewhere for referrals and/or select suboptimal suppliers and facilities.

**Online access to pharmacy prescription images**
Until the German healthcare system moves to a fully electronic pharmacy prescription system, BKK captures prescription images electronically. These images can be accessed in near real time by BKK-affiliated insurance companies, their members and their providers. Online access to pharmacy records helps ensure that members are taking the appropriate medications. It can also help avert inappropriate or dangerous combinations, avoid over-medication and prevent fraud. BKK affiliates can see exactly what was prescribed and match that information with the pharmacy claims submitted.

Web access is furnished through software provided by the affiliated insurance companies. The data warehouse stores linking information and provides a blind pass-through to the Web server where scanned images are stored.

**Fraud detection and invoice verification**
The data warehouse provides BKK affiliates with a strong weapon against fraud and abuse by linking member data with provider claim and invoice data, with up to seven years of detailed history. Previously, insurers were unable to connect individual providers and members, and they had few resources for verifying the claims submitted.

Now, by using BKK’s InfoNet system to access information in the data warehouse, insurers can immediately verify information such as the amount billed to contract, treatments and durations, patient coverage status and provider qualifications.

Fraud and abuse can be a significant factor in healthcare costs, but because of privacy rules and the structure of the German healthcare system, little has been done in the past to identify, measure and fight such offenses. BKK has taken the lead by giving effective anti-fraud tools to its affiliated insurance companies.

**An essential healthcare management resource**
The insight provided by the Teradata solution has led to cost reductions that have allowed BKK companies to significantly reduce their contribution rates, creating measurable savings for customers.

“Our goal is to bring the functions of the data warehouse nearer to each of the processes in the individual insurance companies,” explains Scholz. “The growing number of users, the increased volume of report calls and the growing stream of new requirements from our users all show clearly how InfoNet has become essential for our business.

“Ten years ago, we were beginning to use the data to create our first insights into the structure of costs and benefits. Until then, there was no knowledge. Only one or two analysts in the company could access any of this information. Today the BKK insurance companies have the visibility into many elements of the data—the cost of benefits, the opportunities to reduce cost and the changes that can bring new efficiencies to the process. That represents a tremendous increase in value to BKK that is directly attributable to Teradata.”

*Bill Tobey is a senior technology writer based in Salt Lake City.*

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**Behind the solution: BKK Bundesverband**

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