WHITE PAPER

QlikTech's Approach to Business Intelligence: Keep It Simple and Flexible

Sponsored by: QlikTech

Dan Vesset   Brian McDonough
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IDC OPINION

Business intelligence (BI) software supports two primary functions as part of broader performance management issues faced by organizations. Whether in marketing, sales, finance, operations, or human resources, BI is focused first on information delivery and second on supporting the decision making through ad hoc query, analysis, and data modeling.

BI tools for delivering reports to decision makers have been widely available for decades and are becoming functionally commoditized. Today, the delivery of reports in static form, in printable form, or online with visual cues for quickly understanding performance metrics (or dashboards) to internal and external constituencies is a relatively clear-cut task for the IT department. However, providing an ad hoc query and analysis environment with the flexibility and simplicity demanded by end users, along with reports and dashboards on the same platform, remains a challenge.

Today, only 15% of management-level decision makers are confident that the majority of reports or dashboards developed in their organizations deliver relevant data to the right people at the right time. In delivering data to the business users, IT departments must anticipate the queries that would likely be conducted and develop data models for data warehouses and related online analytical processing (OLAP) cubes accordingly. Data visualization, interactivity, and user access administration options further compound the complexity of delivering relevant and reliable data to the end user.

Much of the problem with BI tools lies in the inability of IT departments to provide the necessary flexibility required by decision makers performing ad hoc analysis. As the demand for BI support rises, IT departments will increasingly come under pressure to support constant changes to end-user requirements. Already, when asked about variables that could lead to wider adoption of BI solutions, 25% of decision makers surveyed sited faster implementation of requested changes. It is unlikely that IT, given its ongoing responsibilities and resources, will be successful in addressing all the query, reporting, and ad hoc analytic needs of end users if it doesn't focus on self-service BI solutions that empower end users to be more independent.

One of the BI software vendors addressing the need for self-service query, reporting, and ad hoc analytics is QlikTech. QlikTech's unique approach to query and reporting allows business users to conduct complete ad hoc analysis and create their own dashboards without the limitation of prebuilt cube data models. The company's

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software enables true free-format analysis through a highly interactive and visual user interface on highly compressed data. For IT, QlikTech provides a self-service BI solution that frees the developers to manage such administrative tasks as data integration and user access rights management rather than address the constant requests from individual BI users. More important, the benefits to the business user include increased visibility into more accurate business data in a flexible interface, whether offline or online, that supports both decision-making and information delivery requirements. In short, QlikTech's approach greatly simplifies analysis and reporting, making it easier for end users and faster for IT to deploy.

IN THIS WHITE PAPER

This white paper discusses developments in the BI software market with specific focus on query and reporting software. It further examines software vendor QlikTech and its offering and position in the market. Discussions with selected QlikTech customers provide further insight into QlikTech's approach to delivering BI solutions without the additional costs and development efforts needed for traditional BI tools such as OLAP.

SITUATION OVERVIEW

BI is no longer restricted to management during planning cycles. Nimble, flatter organizations distribute decision-making responsibilities across the company in support of operational and strategic goals. Investments in transactional systems result in more reliable data being generated about a company's customers, employees, products, suppliers, and partners. The resulting information can be delivered via reports or through dashboards over the Web or corporate network.

However, efficient delivery of information is only the first step in providing complete BI support. Receiving a report or an alert is the beginning of an analytic process that requires ad hoc query and analysis support. The strong suit of most IT departments is the ability to provide increased automation and standardization of repeatable operational processes. One of these processes is the development of "standard" reports that change little over time. Many organizations also have a cadre of power users or quantitative analysts who often act as both data analysts and software developers in coming up with unique and customized solutions to address their own needs.

What's missing then is a middle ground in the form of a technology that enables line-of-business managers and employees to conduct their own ad hoc query and analysis, create dashboards for their own daily operational decision making, and, when needed, disseminate the results of their analysis to colleagues to support collaborative decision-making processes. This market observation does not suggest that the other two BI support tasks (provided by IT and quantitative analysts) are less important or somehow inferior because they don't address today's needs of line of business. Instead, all three need to exist as complementary solutions addressing the specific needs of respective constituents.

What's missing is the technology enabling line-of-business decision makers to conduct their own ad hoc analysis, create dashboards, and disseminate the results of their analysis to colleagues.

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To date, the standard industry IT approach to supporting such BI functionality has been based on production reporting and, separately, multidimensional analysis based on OLAP cubes. Although considered the technology for ad hoc query and analysis, OLAP cubes inherently limit the flexibility business users have for analyzing organizational data.

OLAP cubes require extensive up-front development costs as well as ongoing maintenance as user requirements for various data types and dimensions change over time. To create OLAP cubes, developers are forced into prebuilding data models based on anticipated query patterns. This prebuilding requires IT departments to become involved in new report or data model development every time a business user poses a query not supported by the existing BI solution.

Traditional Business Intelligence: Streamlining Information Access and Delivery

Traditional BI concentrates on information access by and delivery to individuals. Focused primarily on scheduled, batch-based reporting, information access is being supplemented with near-real-time monitoring of business transactions in an effort to reduce data latency and establish early warning systems for the emergence of new trends. As shown in Figure 1, traditional BI software supports activities for the following three steps:

- **Track:** Results from transactional systems are monitored to get a reading on the state of current operations (e.g., the current marketing or recruitment campaign). These results can be compared with targets or goals that have been established.

- **Analyze:** Time-oriented data from multiple systems is integrated into a data warehouse or data mart to support an analysis of key trends. Deviations from expected results or targets, such as factors associated with customer (or employee) attrition, can be explored.

- **Deliver information:** Reports are published and delivered to business users based on the tracking activities and value-added analysis of the data.

The goals of traditional BI are increased speed and higher accuracy in the delivery of information to ever-larger numbers of users. A large number of companies will still invest in traditional BI to address end-user requirements appropriate to their skill sets. However, as already explained, information delivery tools address only part of an organization's requirements for BI software.

Closed-Loop Decision-Centric Business Intelligence Model
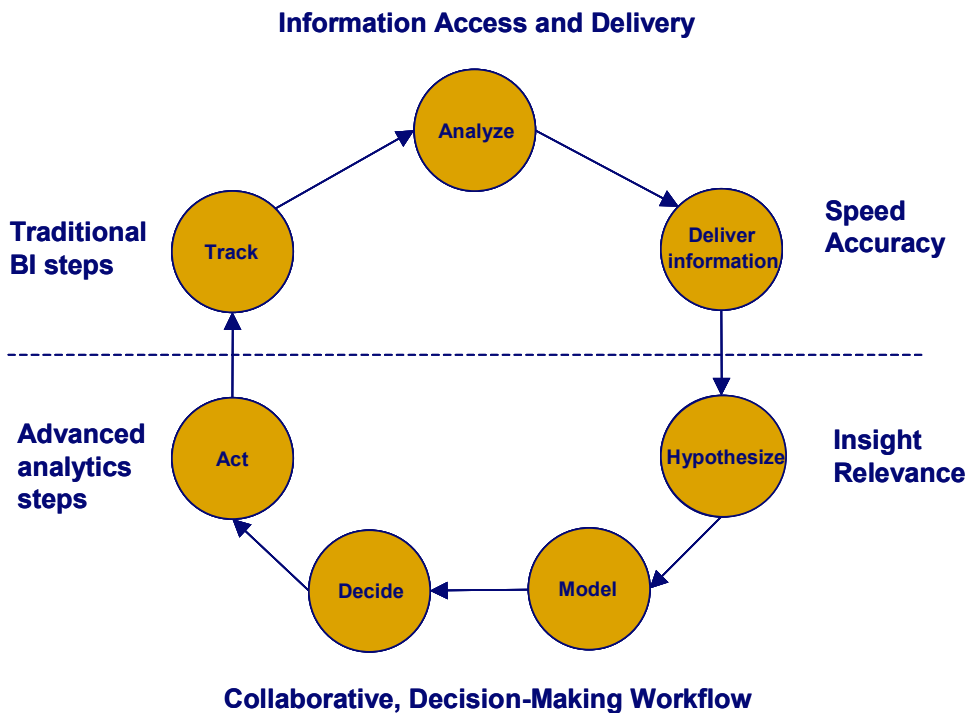
Source: IDC, 2006

Decision-Centric Business Intelligence: Addressing Collaborative Decision-Making Processes

Decision-centric business intelligence (DCBI) focuses on the decision-making steps in a business process. The goal of DCBI is to assess the *relevance* of information to a decision and to gain *insight* in seeking and evaluating possible decision alternatives. These steps are shown in the lower half of Figure 1; they compose a collaborative, decision-making workflow:

☑ **Hypothesize.** The problem is stated and alternative solutions are sought out. There are software aids to searching for new decision alternatives.

☑ **Model.** Models are built to predict the likely result of candidate solutions to a problem. The effects of variable factors on business results are explored or simulated. This is the essence of "what if" analysis and data mining. A key factor is the ability to deal with large amounts of data, find patterns and insights, and deal with uncertainty by showing the likelihood of a desired outcome when a particular alternative is selected.

- ☑ **Decide.** This is the step in a business process at which decisions are made. The results of the analysis and modeling work are considered along with business judgment and knowledge to decide on changes or adjustments to business policies or rules. Decision making is a process that involves a group of people. Therefore, support for team collaboration is vital.

- ☑ **Adjust/act.** Making the decision is only the beginning. Its results must be communicated to all people and applications that are responsible for execution. This can involve the translation of the decision into the form that a particular application requires.

To support the closed-loop DCBI model, organizations require distinct but related products. These products include data integration and management as well as BI (reporting and dashboarding as well as ad hoc query and analysis) tools.

It is not uncommon to find different software solutions deployed to address specific portions of this closed-loop model. QlikTech is a BI software vendor that addresses both the dashboarding and ad hoc query and analysis needs of organizations in midsize and large organizations across a broad range of industries. On the continuum of BI needs discussed previously, QlikTech's software supports the needs of decision makers that are not fulfilled by either production reporting or traditional OLAP-based tools.

QlikTech

Headquartered in Radnor, Pennsylvania, with development in Lund, Sweden, QlikTech is an innovative and fast-growing BI software vendor. Privately held and venture backed, the company has, according to IDC research, experienced over 70% software revenue growth in the past two years (see *Worldwide Business Intelligence Tools 2005 Vendor Shares,* IDC #202603, July 2006).

Founded in 1993, QlikTech released its first product in 1995. As of the middle of 2006, the company has 4,433 customers in 60 countries covering a multitude of industries and, according to company executives, is adding, on average, 9.3 new customers each day. QlikTech has more than 500 partners — which include numerous application software partners and resellers — across the world.

QlikTech, with its flagship product, QlikView, focuses primarily on midmarket clients; however, it also has customers in various departments of large enterprises (e.g., Tetra Pak, Pfizer, 3M, Morgan Stanley, Reuters, ADP, and Colonial Insurance), where QlikView, with its ad hoc query and analysis functionality, dashboard capabilities, and functionality for delivering static reports, often coexists with or complements existing operational reporting tools.

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QlikTech's Business Intelligence Software Solution

QlikTech's QlikView offering delivers BI to those who need it most and in the format most useful to them. The consumers of BI may be outside or inside the organization, online or offline, and require interactive reports, data visualization, and query support or a better means to download relevant data into a spreadsheet.

QlikTech Software Products

QlikTech's software offerings consist of the following products:

☑ **QlikView Server:** The core offering from QlikTech, QlikView Server processes queries and analyzes data.

☑ **QlikView Publisher:** QlikView Publisher enables the distribution of analysis developed on QlikView Server.

☑ **QlikView Analyzer/Professional/Enterprise:** This product provides clients to the end users accessing QlikView Server–based applications. Access can be gained through a browser or a Windows client. It supports both online and offline access. QlikView is available in a variety of levels: Analyzer for end users, Professional for power users, and Enterprise for developers.

QlikTech Software Functionality

QlikView technology is based on a patented in-memory associative data model. This technology comprises three primary components:

☑ High-speed query engine for querying as the user clicks

☑ Analysis or calculation engine for multidimensional analysis

☑ End-user visualization layer for displaying interactive charts and lists

Source data is loaded from underlying systems such as databases, mainframes, or ERP or CRM systems via standard interfaces such as ODBC, flat files, or Web services, or from SAP using its SAP connector. As data is loaded, it is compressed and highly normalized to remove redundancy. Each unique data point for the whole data set is stored only once and referenced through pointers.

For example, if the first row of source data includes the field "red car" and the second row includes the field "black car," then *car* is included only once in QlikView. Instead of the second instance of *car,* a counter associated with the specific pointer referencing this data point is incremented. This data management technique enables QlikTech to eliminate any data redundancy, and as a result the software provides extreme data compression rates. For example, a 400MB source relational database could result in a 4MB QlikView file.

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QlikView is a RAM-based solution — what IDC would call a nonaggregated virtual data warehouse. Because the data is not preaggregated, QlikView solutions don't require any prebuilt data models, as is the case with OLAP cubes. This is a significant difference from traditional multidimensional software tools, which require developers to anticipate the types of questions business users will be asking when creating OLAP cubes so that these so-called ad hoc end-user query needs can be addressed.

QlikTech enables true ad hoc business analytics that are not constrained by the underlying, prebuilt data model. In other words, end users can and do query or "Qlik" through QlikViews at will by combining any and all possible dimensions. QlikView has been optimized for both 32- and 64-bit environments and for multiprocessor systems. This last point is significant because QlikView can take advantage of the larger memory capacity of 64-bit systems and the greater processing power of multiprocessor/multicore systems being offered today.

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Benefiting from QlikView

Companies of all sizes around the world have had positive experiences using QlikView. Most use-case scenarios involve companies that had inadequate or nonexistent query, analysis, and reporting tools and needed to improve the decision-making capabilities of end users inside and outside the organization. Benefits to QlikView users include the following:

◁ **Speed and ease of implementation and development.** Implementation of QlikView can occur rapidly. The software can run on Windows 2000 and 2003 servers and can be set up in hours. QlikTech offers a full version of QlikView for download and trial over a 15-day period. Customers have found this to be an adequate time period during which to build and test applications. QlikTech customers interviewed for this white paper had QlikView production implementation times (including all steps, from proof of concept to final deployment and training) that ranged from 20 days to three months. Applications can be developed in short periods of time using QlikView Enterprise. Several customers who IDC interviewed for this white paper, in many cases business end users themselves, have built analytic applications in less than a week's time. QlikView software includes its own SQL manipulation capabilities for times when access to raw data other than through ODBC is required.

A few customer examples are provided below:

❑ Dakota Healthcare, an insurance firm based in South Dakota, built a large application in less than two weeks to allow its users to navigate through massive amounts of related data generated with each insurance claim. The 200GB database was compressed by QlikView into 500MB and loaded into the RAM of a 64-bit Windows Server 2003. Dakota Healthcare further built out smaller applications based on QlikView at more rapid rates to provide management with more focused key performance indicators (KPIs).

❑ IDG Denmark, a publisher of magazines on information technology and also a business unit of IDG, IDC's parent company, found it needed new BI tools to relate data in two operational systems but wasn't interested in external consulting services to implement a BI solution. Instead, the company chose to download a trial of QlikView. IDG Denmark had some initial skepticism based on the low cost of the solution. However, due to the ease of implementation and functionality, IDG soon became a satisfied, paying customer.

❑ Shell Sweden, a division of the global energy company, wanted to replace its Excel-based reports. Within two days of downloading a trial version of QlikView, Shell Sweden had a prototype application for analyzing financial data. It became a customer and later expanded QlikView usage to sales and operations functions. Shell Sweden trained its employees to use the new system with informal training and an online training program that runs 20 minutes in length. A representative from Shell Sweden noted, "One of the immediate benefits was the elimination of a US$200,000 expense due to incorrect issuance of rebates made possible through better data analysis using QlikView."

❑ Prototyp, based in Sweden, is a manufacturer of threading and milling tools for discrete manufacturers. Prototyp turned to QlikView to replace a variety of legacy reporting technologies and found that following the initial implementation it could roll out QlikView applications in one to two days.

☒ **Ease of use and increased support of end-user ad hoc analysis.** End users need a simple but powerful way to navigate through organizational data. One of the reasons spreadsheets have remained a popular BI tool is their ease of use and flexibility. QlikTech's visual, interactive interface is both intuitive and flexible. The company offers several ways to access its server or publish information. Little training is needed for basic functions, and QlikTech offers online training for all levels of users, including developers, power users, and casual business users. Business users with flexible tools for querying data will be less likely to involve the IT department with each new query request. The result is reduced maintenance costs and improved time to decision and end-user satisfaction. Examples of such self-service BI functionality through QlikView were present at all end-user organizations interviewed by IDC. For an example of the QlikView interface, see Figure 2.

Two customer examples are discussed below:

❑ Deluca Homes, based in North Carolina, is a manufacturer of homes. It turned to QlikView for a variety of analytic needs, including the ability to look at large sets of related data. It provided a wide and varied audience with applications that enable monitoring of the performance of contractors involved in the building and inspection of homes, provision of KPIs to management, and analysis of financial data, all with limited training for the end users.

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❑ At Nacka kommun, a Swedish municipality with more than 4,000 employees, financial controllers were responsible for developing reports and disseminating them to end users, including local government administrators. With QlikTech, the municipality estimates that it was able to save 50–75% of the report development time. Controllers are now able to spend their time on higher value-add activities rather than on data collection and report development.

⊡ **Reduction in the cost and delivery times of reports.** Creating, maintaining, and delivering reports can be resource intensive, time consuming, and administratively costly. QlikView can reduce the costs of managing paper-based reporting procedures. Additionally, many companies still use Excel to manipulate data from multiple sources with little automation. When moving from desktop database and spreadsheet technology to BI software, many midsize organizations interviewed by IDC mentioned that they experienced "sticker shock" when evaluating BI suites from larger vendors. QlikTech was often chosen as much for its functionality as for the low initial and ongoing maintenance costs.

Two examples of customer savings are provided below:

❑ Nacka kommun estimates that it saves 3 million to 4 million SEK (US$400,000–550,000) annually in decreased costs for delivering reports and handling ad hoc queries.

❑ Zurich, a Swiss insurance firm, eliminated the burden of having as many as seven experts in Microsoft Access query the data warehouse in support of decision making prior to its QlikView implementation. Zurich was able to reduce the workload of report development and maintenance from seven full-time dedicated staff to two people working over a two- to three-day period every month.

⊡ **Improved insight into data quality.** IDC market research shows consistently that data quality remains one of the top challenges for organizations of all sizes. Even companies that have standardized on a single ERP system will face data quality issues. Where multiple, disparate data sources exist, the problem can be compounded. QlikView enables administrators or power users to sift through data, often with the data visualization to help identify erroneous data points. The ad hoc query and analysis functionality helps end users become active participants in uncovering data quality problems, which would go unnoticed if only traditional OLAP or production reporting–based BI solutions were deployed.

IDG Denmark and Zurich were pleased with the QlikTech solution:

❑ IDG Denmark indicated that the number of errors present in Excel-based applications decreased as reliance on the spreadsheet-based reporting method decreased. IDG currently has two employees in its accounting department extensively using the visualization features within QlikView to help identify data quality issues.

With QlikTech, the municipality estimates that it was able to save 50–75% of the report development time. Controllers are now able to spend their time on higher value-add activities rather than on data collection and report development.

Zurich was able to reduce the workload of report development and maintenance from seven full-time dedicated staff to two people working over a two- to three-day period every month.

❑ A representative from Zurich stated, "QlikView and ad hoc queries help expose data quality issues that were not known before."

⊠ **Eliminating the need to develop OLAP cubes.** QlikView can integrate data from transactional systems, existing relational data warehouses, or other data sources such as spreadsheets with no need to create OLAP cubes. Although OLAP cubes continue to be appropriate for some applications such as budgeting, they have some inherent shortcomings that make this technology suboptimal for general ad hoc query and analysis. These shortcomings include:

❑ The IT department must address the requirement to expand significant up-front data management efforts on architecting data models and query drill paths that anticipate the future ad hoc query requirements of the end user. Although these efforts are clearly based on user requirements gathered at a given point in time, the IT department cannot anticipate all of the possible ad hoc queries that end users might execute in the future. Therefore, as new requirements arise, significant ongoing development and maintenance efforts by developers are required.

❑ IT often faces a frequent need to rebuild cubes within increasingly narrow time frames. Some OLAP cubes are large data marts with an increasing amount of data. As such they require increasingly more time for rebuilding when changes to data models are made. In some cases, the OLAP cube data loading windows are too short for IT to finish them on a daily basis.

❑ The original impetus for the development of OLAP technology was to preprocess and preaggregate as much data as possible to avoid query processing at the time the end users launch their queries, thus providing a perception of real-time processing. However, this preaggregation of data creates significant data redundancy, resulting in data explosion and subsequent higher IT costs for managing these unnecessarily large data stores.

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QlikView in Action
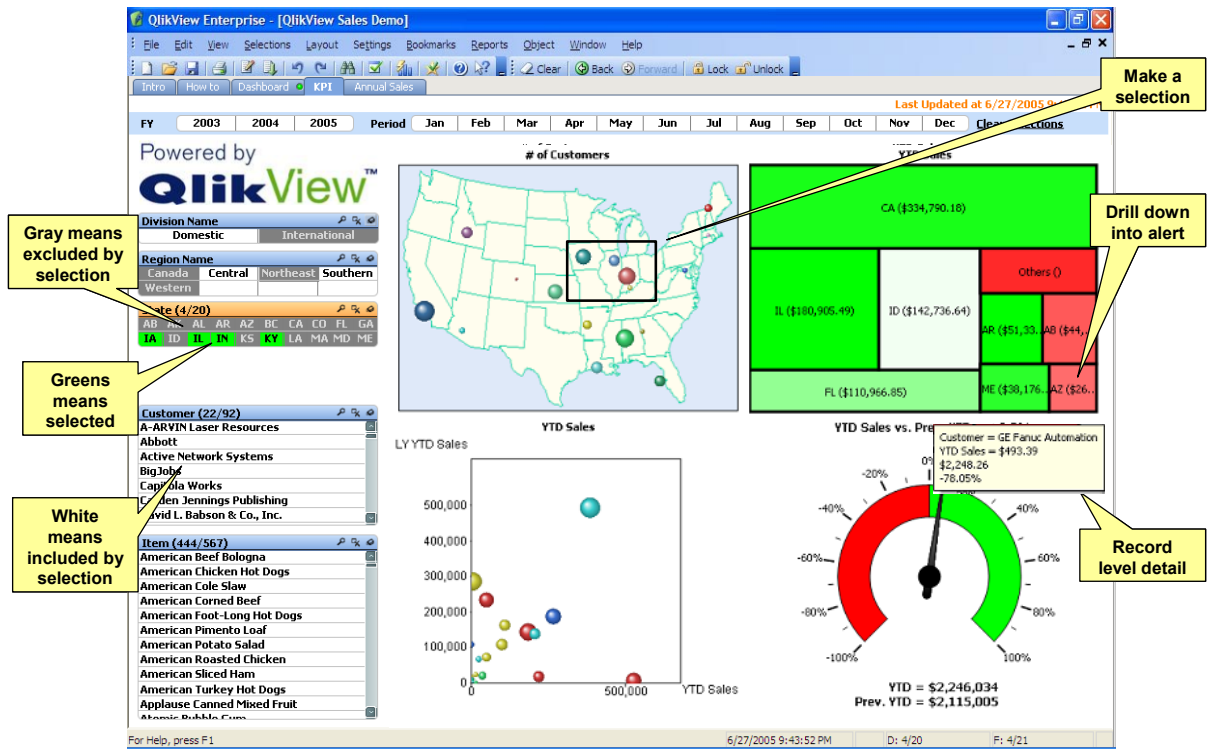
Source: QlikTech and IDC, 2006

QlikView removes the limitations that OLAP cubes have when business users conduct ad hoc queries and pose questions that were not foreseen by cube designers. For example:

❑ Atlas Copco, a 5 billion euro (US$6.3 billion) German construction and mining equipment company, uses Hyperion for financial analysis (based on OLAP technology) while using QlikView for logistics, sales, production, human resources, and IT management analytics without building OLAP cubes.

❑ Nacka kommun replaced custom SQL queries that loaded data into Excel spreadsheets with QlikView, which accesses data through ODBC from its IFS ERP. The company found it difficult to perform the necessary data analysis within its ERP system but at the same time did not want to purchase and develop OLAP-based BI tools. Financial planning and salary analysis were the first applications developed for its end users. A Nacka kommun representative emphasized how user friendly QlikView was, stating, "It is so easy to work with it seems like fun."

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❑ Zurich looked to replace custom-built desktop databases created for support of marketing and actuarial analysis. The determining purchase factor for Zurich was that QlikView did not require OLAP development. According to a Zurich representative, "Underwriters have a lot of ad hoc questions that are difficult to formalize into prebuilt cubes. With QlikView, they can 'qlik themselves' through the data."

FUTURE OUTLOOK

As the BI market matures, end-user requirements are shifting to software that on the one hand supports information delivery to masses of end users through production reporting while on the other hand provides interactive dashboards and ad hoc query and analysis support to analysts, managers, and other decision makers.

The key trends to look for in the BI software market include the following:

◹ **Intelligent process automation (IPA).** Following in the footsteps of the ERP market, an emerging trend in the BI market is the automation of the decision-making process within the broader operational business processes. This trend is manifested in several forms:

❑ IPA aligns the decision-making workflow with business operations. The goal in IPA is to provide end users with software support that matches their natural decision-making processes rather than simply provide end users with reports without any context.

❑ Although many types of decisions are recurring and repeatable and can be automated to a great extent, exceptions within such an automated flow are a certainty and must be dealt with by analysts who require ad hoc query and analysis tools.

❑ The market will continue to develop along the two primary functionality requirements for BI simply because the end-user communities for broad-based information delivery and ad hoc query and analysis are different.

◹ **Structured and unstructured data management and access.** A longer-term trend that is showing early signs of adoption is the convergence of structured and unstructured information within analytic solutions. New tools and applications that combine structured data and unstructured content in fraud detection, customer service, and product development analytic applications are emerging. Deeper convergence of structured and unstructured data extraction and analysis in support of business intelligence is likely to continue.

CHALLENGES/OPPORTUNITIES

As a fast-growing vendor in the expanding BI market, QlikTech will have many opportunities while facing some market challenges. One of the challenges will include educating the market on the possibility of delivering ad hoc query and analysis functionality without the need to create OLAP cubes. OLAP cube development is a de facto standard method for relating data prior to report creation and delivery. Although OLAP technology continues to be relevant in financial applications such as budgeting, planning, and consolidation, IDC believes that its existence as a general tool for report delivery, dashboards, and, especially, ad hoc query and analysis has been exhausted, and new technologies, including QlikTech's QlikView, will characterize the future of this portion of the BI market.

Nevertheless, QlikTech will have to overcome initial skepticism among IT departments considering its technology. Old habits and concepts are often difficult to break, and QlikTech faces strong competition from other BI vendors touting their traditional methods for BI support. About a dozen of QlikTech's customers interviewed for this white paper felt that the attractive pricing, an enticing software evaluation and proof-of-concept development program, and short implementation cycles will go a long way in addressing this challenge.

QlikTech is well suited to selling its solution to resource-constrained midmarket firms, but its support of 64-bit architectures enables its offering to scale to large data sets. This means larger enterprises or companies with larger databases could benefit from QlikTech offerings. As QlikTech better educates its prospect base it will face greater opportunities in the BI marketplace.

For its core market of midsize companies or individual departments in larger organizations, QlikTech has the opportunity to combine its strong ad hoc query and analysis with its robust dashboard creation functionality. This combination of both decision support and information delivery will likely make QlikView an attractive option for organizations looking to minimize the number of different tools they own and maintain for business intelligence.

CONCLUSION

Organizations seeking BI tools to manage the creation and delivery of dashboards, static reports, and ad hoc query and analysis will face implementation, maintenance, and user acceptance challenges inherent with many of today's more popular industry solutions. QlikTech's BI offering provides a BI tool that is relevant to the way business users access information during their daily tasks with a relatively low-cost and easy-to-install product. This should be appealing to IT and business users alike.

Although QlikTech faces an uphill battle as a smaller vendor in a market with large, established competition, it is differentiated in its approach to BI. QlikView can provide companies with dashboards, static reports, and ad hoc query and analysis features that are not hindered by an organization's ability to foresee possible end-user queries.