

# Operational business intelligence

It's time to expand the scope of business intelligences. *by Claudia Imhoff*

**M**ost corporations are inundated with data—from internal operational systems, vendors, suppliers and customers, and other external sources like credit bureaus or industry sales. The problem with understanding where a company is going is not in the amount of data coming into it. The problem is that this data is not in a form that can easily be digested, comprehended or even accessed. This is where business intelligence (BI) comes in.

The goal of BI is to provide a repository of trusted data—data that can be used in multiple applications to answer the questions about customers, products, supply and demand chains, production inefficiencies, financial trends, fraud detection and even employee tracking. It is used to flag anomalies via alerts, provide visualization and statistical models and understand the causes and effects of decisions upon the enterprise. Nearly every aspect of an enterprise's business can benefit from the insights garnered from BI.

## Evolution of BI from strategic to operational

Three forms of BI are found in business environments today: strategic, tactical and operational. This was not always the case. Business intelligence started as a strictly strategic or tactical process. Operations were completely separated from the analytic BI environment and with good reason. Massive queries involving hundreds of thousands of records would have destroyed operational

systems' performance. Until recently, technology was unavailable to support a mixed workload—that is, the ability to perform massive analytical queries and short, transaction-like queries in the same environment.

However, as enterprises see the success of traditional BI environments, they are demanding that the same capabilities (i.e., integrated data, easy-to-use access tools, affordable storage and database capabilities) be made available for business operations. The ability to handle a mixed workload is not easy to accomplish; attempting to handle massive analytical queries and short transaction queries in the same environment can cause performance issues and sub-optimization for both activities.

Business intelligence is being used by business community members who have an operational focus. It is only natural that their requirements stress acquiring data closer to real time. Traditional strategic and tactical BI applications are certainly still needed but operational BI is emerging as an important new trend, particularly in ensuring that the business strategies are aligned with their execution. The table on page 17 illustrates the differences between strategic, tactical and operational BI. It is important for the BI implementers to ascertain carefully what data must be a part of the operational BI environment. Otherwise, we may burden the BI environment unnecessarily with difficult extract, transform and load (ETL) processing for data that may not need it.

## Let's have a reality check, please

The more we accelerate the data acquisition and integration process, the more complex the environment becomes. Let's face it—putting up-to-the-second data into the hands of the entire corporation is expensive, creates a major burden for IT and should require a cost-benefit analysis to determine how fast is fast enough. Corporations need right-time or on-demand data delivery rather than universal real-time data delivery.

The right-time data delivery process is a continuum that is a mix of instantaneous, rapid intermittent or longer batch-type processes, each yielding different delivery timeframes: sub-second to other intervals, such as a few seconds to several hours to overnight or longer. If you accept the premise that right-time data delivery is the correct choice for your business, the challenge becomes properly identifying the time continuum for all business processes; that is, which processes must be accelerated and why. You must perform a baseline assessment of your existing data delivery capabilities (e.g., available technologies, maturity of the BI architecture and existing personnel) combined with a solid understanding of the business requirements for right-time data. It is essential to understand which weaknesses discovered in the assessment will be exaggerated as you accelerate the processes to deliver BI to the enterprise.

Determining the true business need for operational BI is also important, but this may

be difficult. You should start with a good definition and common understanding of right-time data delivery to ensure business community understanding. From this understanding, you should develop scenarios in which operational BI can combine with operational processing to create a smarter enterprise. Let's examine some examples of these types of work flows:

**> Implementation of corporate strategy—**

*How many of us have been told by telecom or utility company customer service representatives that an installer will be at our residence within a four- to six-hour window? It is certainly not my choice to spend four to six hours waiting for the installer. To make matters worse, sometimes they don't even show up during the installation window. Global Positioning Systems (GPSs) and coordination with the operational systems can help these companies better schedule resources. The company would know where the installer is, redirect him or her to a nearby customer if necessary and shorten the wait time considerably.*

**> Capture the customer's attention at the appropriate times—**

*The window of opportunity to offer customers the next best product is while they are standing at*

*the sales counter or visiting a Web site rather than mailing them an offer after they have departed either channel.*

*Operational BI must be integrated into the enterprise's operations processes to enable this form of immediate feedback to the point-of-sale (POS) clerk or to the messaging on the Web site.*

**> Align all employees with the company's new direction—**

*It does no good if analysts determine which products will sell well during the holiday season, yet the dock worker doesn't get the message and loads other products onto delivery trucks. He may continue to do things the same way he has for months without realizing that he is jeopardizing significant revenues for the corporation because he lacks access to the appropriate information.*

**> Compliance violations go undetected—**

*These can be breaches of service level agreements (SLAs) or contra-indications of legislative compliance. In either case, front-line workers may be approaching such a violation and be unaware of it without having proper operational BI accessible to them.*

Business intelligence implementers can use these types of scenarios to determine which components of their BI architecture should be

altered, replaced or rebuilt to ensure faster delivery and integration of BI. We are fortunate today to have a variety of integration technologies (i.e., enterprise information integration (EII), enterprise application integration (EAI) and ETL) to help deliver data and BI information to front-line workers and to have the engines (mixed workload technologies) to support their requirements.

### Impact of operational BI on the BI environment

This shift from strategic BI to operational BI has some dramatic ramifications for most BI environments—the most obvious being the increased number of users. Traditional BI rarely had to support more than a few hundred, maybe a thousand or so, users as most enterprises don't have that many analysts. Opening BI up to operational personnel, though, means ramping up into the thousands, even tens of thousands, of users. These users also have varying interface requirements as they are used to operational systems that are menu-driven, have clear navigation pathways and promote quick comprehension through visual and simple mechanisms.

Because of these requirements, BI implementers may have to rethink the way BI is delivered. In many cases, the operational systems and user interfaces can remain the same, but they are augmented with strategic insights. For example, an airline agent checking people in might have a screen for seat re-bookings (e.g., bumping some people into first class). The decision about who goes on what class seat doesn't require any new user interfaces, per se. The BI implementer must determine how to deliver strategic information to many more people. It means tighter and faster connectivity of the enterprise decision-support environment to the rest of the company. It may also require communicating in both directions; that is, more "events" coming into the system and more "decisions" going out.

The data volumes needed to support operational BI also must increase significantly. Detailed intra-day data snapshots are now

## Differences between strategic, tactical and operational BI

	STRATEGIC BI	TACTICAL BI	OPERATIONAL BI
<b>Business focus</b>	Achieve long-term organizational goals	Conduct short-term analysis to achieve strategic goals	Manage daily operations, integrate BI with operational systems
<b>Primary users</b>	Executives, analysts	Executives, analysts, line-of-business (LOB) managers	Line-of-business managers, operational users and systems
<b>Timeframe</b>	Months to years	Day(s) to weeks to months	Intra-day
<b>Data</b>	Historical metrics	Historical metrics	Right-time metrics

being loaded into data warehouses, increasing the amount of data stored linearly. Tens to hundreds of terabytes are not unusual storage requirements. This makes scalability mandatory in any BI technology, whether it is in data processing and integration, storage of massive volumes or retrieval of query responses.

And finally, for operational BI to be useful in operational situations, its query performance must mimic or emulate response times in operational systems—that is, sub-second to just a few seconds. The ability to prioritize queries not only according to their importance but also to their response requirements is a difficult but necessary success criterion.

Handling such a mixed workload—including operational response times, short tactical queries, massive analytical queries, thousands of concurrent users and large volumes of data—takes careful planning on the part of the technology vendor. A successful mixed BI environment depends on how well the technology vendors have embraced this new paradigm.

### Impact of operational BI on operations

For operational BI to be most effective, it must be integrated into operational systems and processes to yield an ideal right-time decision-making environment. This requirement can pose some difficulties, though, if your operational environment is not ready to interface with this new form of BI. Several reasons exist for this incompatibility, not the least of which is the age of the technology used in operations. Older technologies may have proprietary or fragile processes that make interfacing to the operational system difficult or disruptive. In these cases, you may have to replace the older operational system with a newer one before a functional workbench can be created.

In other cases, EII technologies may be used to create the integrated environment and virtually display operational data alongside the operational BI results. One caveat is to carefully monitor the impact the EII technology may have on the operational system. If the intrusion of the

EII technology impacts operational system performance, then this virtual environment will be unsuitable.

The operational BI results could also be fed directly into the operational system through a message brokering mechanism. For example, a list of next-best product offers for specific customers could be transferred into the customer service representative's (CSR's) contact management system where it is displayed along with the other customer data when a customer is contacted. The simplest answer for many environments might be to evolve what you already have. In some situations, the CSR screens could be augmented with new fields and panels to hold the BI results, not replaced with another display mechanism.

### Creating a world-class mixed-workload environment

In building your operational BI applications, many factors can impact success:

- > *An operational BI project's scope is important: creating an operational BI application may have ramifications beyond the project's immediate boundaries. In choosing your first operational BI project, pick one that is strategically needed but can be accomplished in a reasonably short timeframe (like three to six months). Look for gaps in your current operational processing where operational BI could help. Do not try to make big changes to the operational processes; just increase the speed or efficiency of the processes currently in place.*
- > *Once you have chosen a project scope, perform a feasibility study of the proposed operational BI operations interface. Understand how the project may impact the operational system's performance, database design and other factors. These technical aspects can affect your project's timeframe and increase its scope.*
- > *The implementation of operational BI will likely require retraining of operational personnel. How they make decisions, how they access and use the information flowing*

*from the application and how they monitor the impact of their decisions may change dramatically.*

> *Operational BI applications generally cause changes to operational procedures or processes. The changes are usually needed to ensure that the operational BI information is optimally used. Since these are new applications, the traditional processes may have to be rethought or rewritten to ensure proper execution.*

### A promising future

Business intelligence has evolved from the analyst-only environment of strategic and tactical analytics. Today, it is front and center, supporting the operational decisions as well. To be truly effective, all three forms of BI must be implemented in a cohesive and manageable fashion. With the new technological advances from companies like Teradata, it is now possible to integrate BI with operations. Mixed workload environments with both transactional and analytic attributes can be supported on a single database.

However, it is important to stress that operational BI projects must be carefully scoped and the ramifications to the operational processes and systems thoroughly thought out. New procedures, interfaces and, perhaps, even retraining of operational personnel may be required to take advantage of these new capabilities. Once created, the advantages of making faster, more accurate and better-informed operational decisions are numerous. Better competitive advantage, stronger customer relationships and more efficient operations are just a few of the benefits from integrating BI into your operations. **T**

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