

WHITE PAPER

How IBM Business Monitor Enables Operational Intelligence

Sponsored by: IBM

Stephen D. Hendrick Jeff Silverstein
Henry D. Morris
December 2013

IDC OPINION

Businesses need visibility into information and events in time for corrective actions that remediate issues and drive business goals. To put it another way, business managers need operational intelligence — the ability to sense or, preferably, to anticipate business conditions in time to respond to changes to the business and to the critical operational processes that run the business. Yet achieving visibility and the operational intelligence to act remains a challenging goal that requires the following:

- ☒ **Relevant, timely information.** It's not that there's not enough information — in the age of Big Data, often there is too much information, and it's delivered too late to the business professionals who need it. Businesses need to be able to sort out what information is most relevant and get that information in time to act.
- ☒ **Sourcing key performance indicators (KPIs).** Many IT systems run business operations, but businesses need to be able to identify the systems that are the best sources of key performance indicators and then populate the metrics.
- ☒ **Exception handling.** Businesses have driven productivity via IT systems that automate key processes. But the automation is incomplete. The ability to identify the types of exceptions that occur frequently and trigger actions to handle these exceptions is a key to improving efficiency.

Business visibility via business monitoring provides continuous business management. From a value perspective, business monitoring enables operational intelligence into business-critical processes and workflows. IBM's approach to business monitoring is well aligned with addressing the need in organizations today to gain operational intelligence in time to act.

IN THIS WHITE PAPER

This white paper leverages IDC primary research and buyer-focused research to derive an understanding of the customer perception of the business benefits of business activity monitoring (BAM). This document synthesizes data from two interviews to expose key value components associated with business activity monitoring adoption and modernization. These use cases are summarized to put value drivers in context and to identify challenges and best practices in using IBM Business Monitor. This white paper includes a brief discussion of the role of business

activity monitoring technology in an increasingly complex world where real-time operations, business visibility, and application management are all critical to remaining competitive in today's fast-changing business landscape.

SITUATION OVERVIEW

The Increasing Significance of Business Monitoring

When it comes to operational systems, you have to measure it in order to manage it. Peter Drucker is widely credited with this saying, and it takes on added meaning today. Enterprises seek improved visibility into fast-breaking trends and business events in time to proactively respond, driving greater efficiency and productivity that lead to improved business outcomes.

Take order fulfillment as an example. Businesses have implemented ERP systems to automate this business-critical process. But how do you know that order fulfillment is running effectively? Visibility requires ongoing monitoring of key performance indicators such as order accuracy rates (error-free orders/total orders), order cycle time, partial fill rates, back order status, and rates of returned goods. Which exceptions are delaying order cycle times, and what is the change in the daily, weekly, or monthly numbers?

Operational intelligence is becoming a requirement across industries and business functions. Consider the following scenarios:

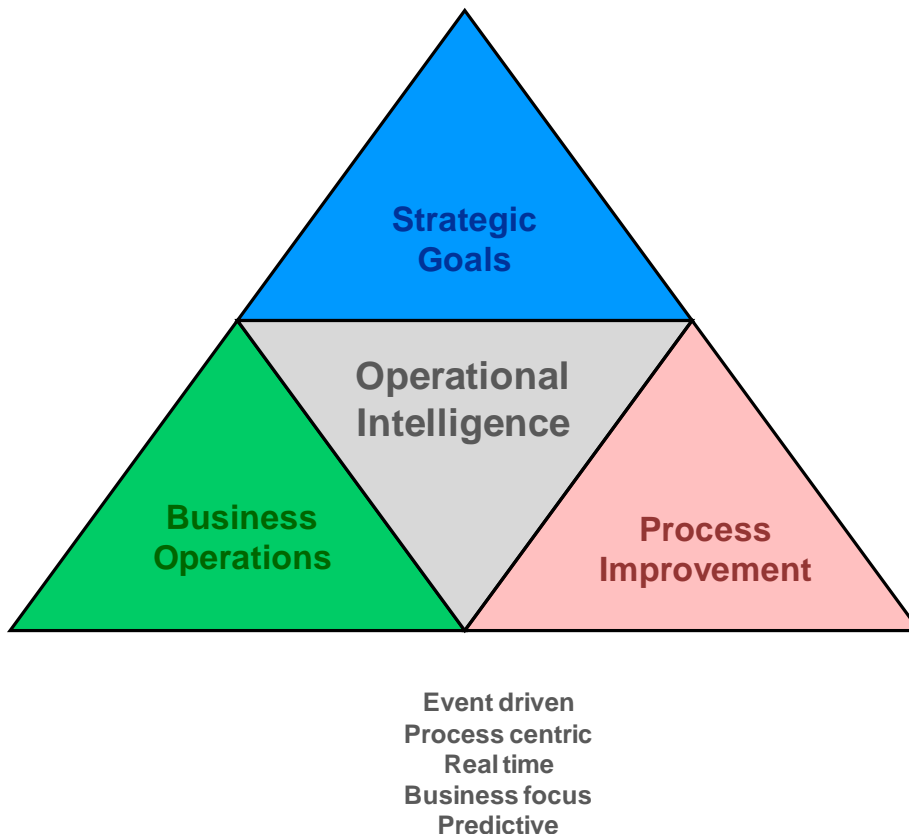
- ☒ **Customer churn.** A marketing or customer service agent for a telco provider receives notification of an event or series of events that signals the potential churn of a key customer — in time to deliver a special offer in an effort to retain the customer.
- ☒ **Supplier performance.** A merchandise manager for a retailer is notified that the performance of a supplier has suddenly degraded based on a measure of return rates for its products. This provides an opportunity to negotiate with the supplier and/or identify alternative sources for the goods.
- ☒ **Predictive maintenance.** A maintenance manager is informed that a pump is showing early signs of potential failure — in time to deploy another pump and also to schedule the problematic pump for priority repairs.

Monitoring business measures enables early warning of business changes in time to identify root causes. In addition to rapidly identifying new trends, a business monitor can seek to flag specific events, such as a rush order from a key customer that may require reprioritization of other orders to meet the promised delivery schedule. Once an exception to the normal flow of a business process is identified, a responsible agent or manager can be notified and/or a previously defined corrective action for the type of exception can be automatically invoked.

Businesses are challenged to ensure that operational business processes are contributing value consistent with the strategic direction of the company. Another challenge on an operational level is to ensure that the actual operation of processes is consistent with their planned operation. Figure 1 depicts the role of operational intelligence (enabled by business monitoring) in aligning corporate strategy with business operations. This alignment requires that the businesses monitor operational measures that have the greatest impact on the achievement of corporate strategic goals, detect exceptions, identify threats, discover opportunities, and take appropriate actions.

FIGURE 1

The Challenge of Aligning Business Strategy with Operations



Source: IDC, 2013

Operational intelligence is the key to aligning strategic goals with the actual performance of business operations. Business monitoring enables operational intelligence, requiring the instrumentation of business applications to generate key events. The event data is detected by the business monitoring platform and used to calculate KPIs and generate notifications that enable the monitoring and management of business-critical processes.

Business monitoring in support of operational intelligence requires the following capabilities and attributes:

- ☒ **Event driven.** Being event driven means the ability to instrument business applications to generate events and then to assemble and evaluate performance measures based on the event data. Events denote real-time operations, which are necessary to support effective monitoring and exception handling.
- ☒ **Process centric.** Process centric means the instrumentation of a set of applications to capture metrics about a business process — whether or not the process is orchestrated in a business process management system (BPMS).
- ☒ **Real time.** Because IT operations are evolving to support a wider variety of interaction patterns, it is critical that systems intended to monitor and manage business operations do so as they occur, in near real time.
- ☒ **Business focus.** Astute users of operational intelligence tools will instrument applications with an eye toward providing business visibility. This requires a more comprehensive understanding of corporate strategy to prioritize the production of those business visibility metrics that can help steer the business to meeting its stated goals.
- ☒ **Predictive.** Advanced operational intelligence tools use events as the raw data to calculate KPIs. These KPIs not only support a high level of automated reporting through dashboards but also have the ability to be predictive. The identification of patterns in the operation of a process provides advanced alerting of impending issues, giving the enterprise time to resolve issues before they become visible problems and to react quickly to opportunities.

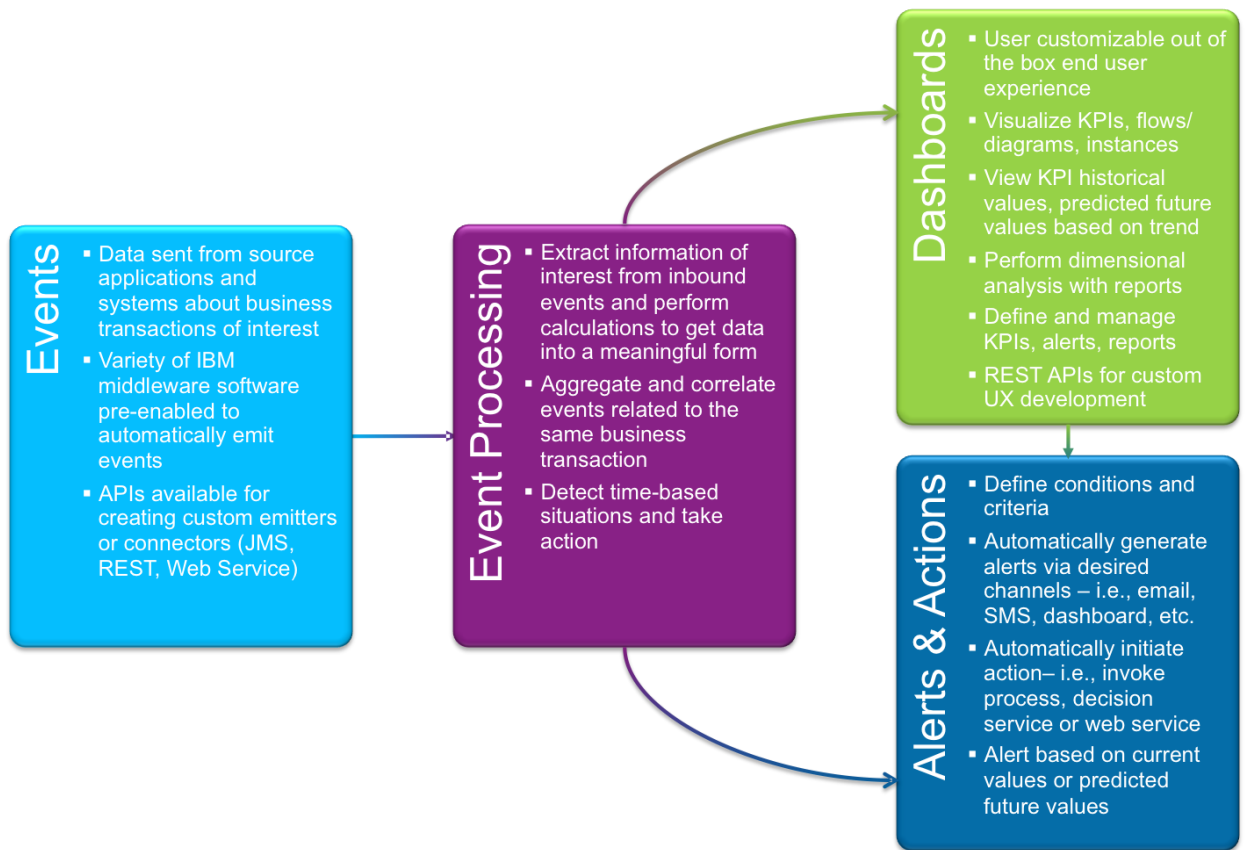
Operational intelligence represents a key tool for process improvement because it is chartered with examining whether current operations are delivering value in the context of the intended corporate strategy. This means that operational intelligence provides a window into the current state of operations, supporting the evaluation of what is necessary to transition from the current state to a desired future state. While operational intelligence tools are not enterprise planning tools, they provide key information regarding how well the current business processes and operational systems are performing. This visibility into and learning about the state of business operations can be directed back to the evaluation and reformulation of corporate strategy.

IBM Business Monitor Version 8

IBM Business Monitor version 8 builds on a succession of prior releases that were each designed to improve the capabilities and utility of the product. Figure 2 illustrates the key capabilities of IBM Business Monitor.

FIGURE 2

IBM Business Monitor Key Capabilities



Source: IBM, 2013

The intent of Business Monitor is to provide visibility into the current state and direction of the business in time for action. IBM Business Monitor is designed to access business event data, which is filtered, measured, and correlated to create KPIs that provide insight into the volume, variety, and velocity of selected business transactions. These KPIs can be displayed on a dashboard and configured to generate alerts and/or initiate automated remedial actions. The capabilities of the product relate to the following four domains:

- ☒ **Events.** Events represent source data that enables the measurement of ongoing business processes. IBM middleware products are engineered to enable the collection of such event data out of the box. In addition, custom linkages to business applications can be established. The net result is that IBM Business Monitor can capture data emitted by events (such as the processing of a key transaction) deemed to be of interest to the business.
- ☒ **Event processing.** The fresh data from events is then aggregated and analyzed to provide a meaningful measure of a trend over a specified time period or to flag a specific event that may require an immediate response from a business agent.
- ☒ **Dashboards.** Packaged as well as custom measures and trends are displayed on a dashboard. The dashboard's appearance/user interface can be customized according to user preference. Predictive analytics yield insights based on the examination of events and measures that signal future conditions that impact the functioning of the business.
- ☒ **Alerts and actions.** These trigger a coordinated, consistent response across multiple channels or, alternatively, direct an alert to a human agent who can then make a timely response to the identified situation.

IBM Business Monitor version 8 became generally available in May 2012. Business Monitor is already a mature product, and as a result, the new features available in version 8 expand on existing capabilities related to instrumentation, analytics, and reporting. Table 1 summarizes the new and key features found in Business Monitor version 8.

Business Monitor version 8 brings enhanced visualization and reporting features. A dashboard can display a workflow graphically in a "milestone" view including up-to-the-minute summary statistics that show actual performance versus expected (or planned) performance. The KPIs can be shown on a dashboard, enabling immediate monitoring , alerting, and reporting, using the embedded IBM Cognos BI Server.

TABLE 1**Summary of New and Key Features in IBM Business Monitor Version 8**

Feature	Description
End-to-end monitoring across systems, products, and processes	Provides real-time end-to-end monitoring and visibility into business transactions that span multiple systems or products, with sophisticated event correlation across disparate systems
Real-time dashboards	Visibility into real-time processes can improve business results by enabling business users with early detection, alerts, and timely notifications to manage business situations, along with the ability to take corrective action if necessary
Built-in tools and runtime support	Tight tooling and runtime linkage with the IBM Business Process Manager, SOA, and WebSphere Operational Decision Management suites as well as built-in support from CICS, Sterling Commerce, and IMS, providing for quick, low-cost BAM implementations
Automatic generation of dashboards	Enables automatically generating dashboards for any monitor model, simplifying the creation of dashboards and facilitating faster time to value with rapid iterative development and playback for monitoring dashboards
Dynamic user interfaces	Enables views of KPIs, metrics, and alerts where and when needed through Web interfaces, corporate portals, and mobile devices, such as iPads/iPhones, BlackBerry, and Android, to instantly respond at the point of impact
Predictive algorithms for KPIs	Generates predictive values for KPIs for future time periods to help plan for and manage your business proactively
User-customizable Web 2.0 business dashboards	Empowers business users to define and very easily view new KPIs, facilitate data filtering, and set up dashboard controls, reports, and alerts
Extensive set of pre-enabled business event sources, with ability to extend as needed	Enables business users and developers to seamlessly integrate content from other IBM middleware products or custom sources, providing comprehensive representation and control over business processes, operations, and transactions
Fully integrated Cognos BI Server 10.1.1	Rich embedded analytics enable business users to analyze historical data and make smarter business decisions to improve performance and drive superior results — reports can be easily authored at design time and incorporated into automatically generated dashboards
Fine-grained security	Easily configure who is able to see exactly what range of information depth or detail for dimensional, KPI, and instance data
Scalability, deployment, and operational functionality	Provides significant scalability, resulting in much higher rates of events that can be processed per second

Source: IBM, 2013

How Customers Are Deriving Value from IBM Business Monitor

State Tax Authority

A large state tax department is tasked with collecting personal and business taxes for the state's residents and businesses. This tax organization has about 640 IT employees, about 50% of them in development, another 10–15% in architecture, and the remainder in production services and infrastructure. The organization's annual budget is around \$75 million.

The organization overhauled its tax systems in the 2004–2006 time frame. Part of this modernization involved moving the department from a paper- and batch-oriented world to an electronic and online world. Part of the effort to modernize involved the adoption of a workflow engine and business activity monitoring.

The department processes millions of personal income tax returns annually. Prior to the modernization, about 4% of the returns contained errors that required a person to look at them and manually intervene. This translates to more than 400,000 pieces of work called exceptions that required corrective special handling before they could be returned to the processing queue. Exceptions were not categorized by type of error, which made it difficult to identify and resolve errors efficiently.

One goal of the modernization effort was to categorize exceptions by type so that a tax accountant could be routed like exceptions, which would improve accuracy as well as throughput. Another goal of the modernization effort was to process refunds faster. The large volume of returns submitted close to the filing deadline combined with the high number of exceptions created a challenging environment for processing refunds as well as a liability in the form of interest payments when refunds were delayed. The department needed tools to categorize work items, define workflows, and monitor the performance of the department.

The department started by adopting IBM's MQ Workflow (which was transitioned to IBM WebSphere Process Server several years later) to address workflow issues. The department also adopted IBM Business Monitor in 2005 to address performance monitoring. The department realized that business activity monitoring was going to be an important component of the solution to process improvement because of its ability to present real-time information on the flow of work items into and out of the various processing queues.

The department considered building a proprietary monitoring capability instead of buying Business Monitor. However, the user interface development would have been extensive, and the department would not have had the same level of integration with other IBM products as Business Monitor. Also, if the department had pursued building its own monitoring, the easiest path would have been to modify several existing applications, which would not have provided the same centralized focal point for managing the business. The department chose IBM Business Monitor because, at the time, it was the most integrated workflow-based monitor. All of the other products that the department evaluated were more general monitors and, therefore, not as well suited to its business needs or nearly as well integrated with the other IBM products that the department uses.

As the department began modernizing its personal income tax systems, it became clear that exception processing with workflow and monitoring was going to be the biggest game changer in the department because of the ability to continually understand how process queues were changing and optimize the alignment of resources with these queues. These improvements allowed management to understand the number of returns coming in, which returns required exception handling, how best to manage these exceptions, and the number of returns shipped out.

The "sweet spot" for Business Monitor was its support for exception handling. During the tax return season, more than 500 tax accountants in the department are assigned to exception handling. Business Monitor provided the department with insight into the volume of work items in each exception queue and enabled managers to reprioritize queues and align accountants with queues where they were most needed. This improved the efficiency of exception processing and significantly reduced the average turnaround time for a return.

Recent improvements in processing tax returns, including the increasing percentage of electronic tax filing, have cut the number of exceptions from 400,000 to 150,000 annually, but exception handling will remain a human-intensive process.

The result is that Business Monitor has proven to be effective at helping the department manage tax return exception handling, but this is not the only use case. The department is using Business Monitor to track the business reregistration process as well as debt collection. Both of these processes have complex workflows, financial penalties if taxes or fees are not paid, and queues for those cases that require human intervention. Business Monitor, when combined with analytics, has proven effective at tracking and assigning cases as well as reporting on how successful the department has been at resolving cases and collecting taxes and penalties. After Business Monitor was tied in to the collections process, collections went up \$78 million in the first year.

An IT representative from the tax department said:

We can barely keep up with the demand of building more of these models and having people monitor these things. Historically, what people used to do is have a lot of spreadsheets where they would watch process information offline. Now, they watch it online. It's a game-changing technology. A workflow engine with IBM Business Monitor is a no-brainer for the department — it tells the department what it is doing and how to improve it.

Another benefit of IBM Business Monitor was workforce redeployment. The department reorganized to become more agile so that tax analysts could be temporarily assigned to work queues where they were most needed. Analysts can now work on a far wider range of projects based on where Business Monitor helps managers identify peak loads in demand.

IBM Business Monitor not only helps organize exceptions but also gives users more insight into the particular type of exception, which helps accelerate the solution. So when workers are handed an exception, they already have some knowledge regarding what caused the exception. It gave the department an opportunity to work smarter.

The department summed up its experience with Business Monitor as follows:

IBM Business Monitor has allowed us to get the users the knowledge of their processes that they have always needed. We could have done BPM without it, but we would have had to have been reinventing and writing our own reports, and it would have never been as current and up to date as what they get out of the monitor. It is a game changer for our businesspeople, and not only that, but knowing overall what the executives wanted in a second is highly advantageous. We never knew how many returns came in a day, which ones were flagged as exceptions, or how many refunds went out. If you were to look at the department 10 years ago and compare it to today, you would see that it is completely transformed.

The department still has three or four major processes that are still manual. What the department hasn't gone through yet is a complete feedback loop, where at some point in time we could take all of our exceptions and figure out what caused them, with much higher levels of automation. One of the greatest benefits that Business Monitor provides is its single dashboard and centralized approach for managing workflow. IBM Business Monitor plays a pivotal role because now the businesspeople know how many and which types of exceptions they processed last year and how much they were worth to the business.

The best way to evaluate Business Monitor's success is to look at demand from the users to get everything monitored and automated. The Federal tax authorities would love to be doing what we do. We are quite a bit ahead of them.

TradeMerit

TradeMerit, founded by Wael Aggan, Tarek El-Gillani, and Sami Al-Husseini in 2006, is an emerging provider of supply chain management, business process management, cloud computing strategy, and risk management services. These products are intended to identify organizational business plans and then monitor and compare actual performance against these plans in real time. TradeMerit's product is built on the company's proprietary tmEvent platform combining visibility, analysis, and event and process management. Customers use TradeMerit's products to support demand forecasting, order fulfillment, procurement, inventory management, logistics, and compliance.

As TradeMerit began constructing its event-based supply chain solution platform in 2007, it knew that visibility and process control spanning different processes, systems, and formats used by supply chain participants were critical requirements. TradeMerit wanted an architecture that would be able to leverage the existing information sources and applications of its customers via a service-oriented architecture (SOA) that would minimize coding.

TradeMerit believed from the start that its value would originate from being able to take a supply chain, enable members of senior management to describe what behaviors and performance they expected from the supply chain, monitor the actual behavior and

performance, and then help remediate issues where there was a difference between expected and actual performance. This meant that TradeMerit was primarily interested in finding tools that would easily enable low-level event-based instrumentation of source applications and higher-level tooling to put these events in context and create meaningful KPIs. One of the things that TradeMerit liked about IBM Business Monitor was its service component architecture (SCA) and how much more advanced it was than other products at that time. "At that time, at least in terms of complete expectations for our architecture, it was far ahead of the other alternatives," said El-Gillani.

TradeMerit looked at a wide array of products before settling on IBM Business Monitor and WebSphere Process Server (now IBM Business Process Manager). TradeMerit evaluated products from Microsoft, Oracle, and Red Hat at the time, but none of these vendors provided products that were specifically designed to address integration requirements at a low level in both a technological way and a business-oriented way.

TradeMerit chose IBM Business Monitor to fulfill the visibility component of its cloud-based platform for the following two reasons:

- ☒ Business Monitor provides a common business events infrastructure.
- ☒ Business Monitor was a key complement to another IBM product (WebSphere Process Server) that TradeMerit was using for SOA/SCA core services and common event infrastructure.

One of the objectives for TradeMerit's supply chain management solution framework was, "Would this [solution] allow the company to put its value-add proposition on top of the existing components, or would it have to also do a lot of new coding and glue things together?" That question had been answered during the vendor selection process. But TradeMerit's requirements quickly evolved after the company began developing its solutions for clients, according to El-Gillani:

[At first], we were worried about two things: How are we going to integrate, and then how are we going to do KPIs and metrics and so on? [Now], we are actually more about how do you detect events and outcomes than anything else. Dashboarding and displaying a dashboard really aren't great differentiators to be honest with you. The differentiator is coming to somebody and telling them, 'Listen, it is not just that we are giving you a dashboard, but the dashboard is a reflection of the objects happening in real time, and it is actually going to show you what the rates of exception are when it doesn't follow your plan.' The why part is what requires quite a bit of event processing, which we were not focused on when we first started.

When we started, we thought [our ability to] optimize [a supply chain] would be okay. We would look at the numbers, identify where the problem is, and try to remodel your processing and improve it. One of the things we are doing now is not necessarily that the steps in the process need to be optimized, but how different processes are tying together.

At the end of the day, [our platform] is a tool to deliver the business requirements. What we sell to the clients is not a business monitor. What we sell to them is to be able to follow the requirements A, B, and C. From a top level, you have the KPI model. I can compare users against these policies that I have developed. Also, on a transaction level, when an event happens out of the expected, it should trigger an action to follow.

Benefits

One of the first benefits of IBM Business Monitor to TradeMerit was in launching its solution platform. "It would have increased our time to market [without it]," confirmed El-Gillani. TradeMerit estimates that without IBM Business Monitor, the delay would have been six months to a year.

Real-time business activity monitoring is the core value of IBM Business Monitor. It enables the event processing and analysis that underlie TradeMerit's solutions. It helps TradeMerit's clients understand the current state and the current performance of their systems.

Ease of change is another IBM Business Monitor benefit. In a recent TradeMerit project, the company had to change how things are wired from being synchronous to being queue based. It took less than a day and required no code modifications. "It gives us an abstraction level where we don't have to actually do any coding. I can go and focus on modeling how the business events impact metrics and what they should trigger as an outcome," said El-Gillani.

IBM Business Monitor makes TradeMerit more agile. "If I get a call now from a potential client and they start describing the high-level process and I realize that this is not exactly like what we have and we want to make a change — we can do that fairly quickly on a kind of a demo image and bring that up, and that will be ready in a few days for them before the meeting. That responsiveness or agility basically is very important to us," El-Gillani said.

Conclusions

TradeMerit's use of Business Monitor enables the company to operationally define, connect to, configure, and monitor business events. Accomplishing this with off-the-shelf software has saved TradeMerit significant R&D effort and provides a generalized foundation for monitoring a wide variety of platforms and applications without resorting to coding or database triggers. Business Monitor's operational intelligence capabilities ensure that TradeMerit can define and monitor the KPIs that the company identifies as critical to ongoing supply chain operations. Without this insight into actual operations, TradeMerit would not be able to compare the current operational state with the planned operational state and help enterprises address process governance and improvement.

El-Gillani also offered the following advice with regard to using Business Monitor: "The key thing from a high-level business perspective is to not approach monitoring incrementally. With any business process, especially if it is event driven, you will always have a lot of exceptions, and it is not practical to try to handle all of the exceptions at first. From a lower level, keep in mind the need to scale."

El-Gillani's advice is very pragmatic. Because there is really no limit to the depth that you can instrument business processes, it is best to begin monitoring at a high level and over time drill deeper into those business processes that are either more complex or most critical to your enterprise's operations. The scalability comment is intended to communicate the important role that Business Monitor occupies in an enterprise and the need to ensure that it is resourced correctly.

CHALLENGES/OPPORTUNITIES

IBM Business Monitor version 8 reflects a significant level of maturity. Consequently, the challenges and opportunities that face Business Monitor are more closely tied to the rate at which the industry is evolving and the affinity of IBM Business Monitor for other IBM products.

Challenges

Tools that address business visibility or business activity monitoring generally fall just outside the critical path of application development and deployment because they are not absolutely necessary for the implementation of functions in an operational system. In addition, organizations that are new to business monitoring need to learn new technical skills and forge new paths of collaboration between business and IT stakeholders. Companies need assistance in making the business case for this technology, putting an estimated value on the process improvement, increased productivity, better visibility, and more timely responsiveness to events and emerging trends that are relevant to the business.

Addressing this challenge of making the value case requires COO, CIO, executive, and line-of-business support because of the cooperation necessary between IT and the primary stakeholders of the business to link corporate strategic objectives to operational policies and measures. Making this investment in operational policy paves the way for tools such as IBM Business Monitor that create business visibility. This is becoming a higher priority among businesses that put a premium on increased responsiveness to events and trends that demand timely decisions and corrective actions.

Opportunities

Understanding what to monitor from a business value perspective as well as the level of granularity at which to monitor determines how much utility Business Monitor provides. Since most systems that are important to monitor have a transaction orientation, IBM should consider providing either best practices or templates that offer enterprises a quick-start foundation when implementing Business Monitor. Examples that show how corporate strategy influences operational strategy by industry would help both IT and Business Monitor users more quickly gain a sense for what should be monitored. The reason for this is that issues such as business performance, customer satisfaction, and exception handling are critical to the success of the enterprise. Gaining a more rapid and complete understanding of these critical success factors and how to monitor and manage them is an area that IBM should make more explicit in communicating the benefits of Business Monitor.

CONCLUSION

IBM Business Monitor excels in its role of delivering business visibility and management because of its event-driven architecture and ability to evaluate performance across transactional and system states. Business Monitor's ability to evaluate, report, and manage in near real time directly addresses delays between problem (or opportunity) detection and remediation. The product's ability to leverage events also enables the analysis of more complex relationships between tasks and events, thereby providing Business Monitor with more powerful capabilities for evaluating and ensuring that business processes meet expectations.

Enterprises are turning to events and messaging in support of improved business efficiency and responsiveness. With continued investment by IBM, Business Monitor can become a key element in an organization's strategy to deliver operational intelligence.

Copyright Notice

External Publication of IDC Information and Data — Any IDC information that is to be used in advertising, press releases, or promotional materials requires prior written approval from the appropriate IDC Vice President or Country Manager. A draft of the proposed document should accompany any such request. IDC reserves the right to deny approval of external usage for any reason.

Copyright 2013 IDC. Reproduction without written permission is completely forbidden.