

Business analytics for manufacturing

Four ways to increase efficiency and performance



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Overview

Whether the economy is strong or weak, the fundamental strategies for surviving and thriving still hold true. Manufacturers have to be highly efficient to meet demand and supply requirements. Costs and resources also have to be managed carefully and intelligently.

At the same time, companies are considering new tactics: inventory optimization, maintenance operations, intelligent supply chains and leveraging technology as a focal point of business strategy.

In order to be successful your company needs access to critical information and visibility into how well your business, your market and your competitors are responding to today's challenging and changing times.

Staying ahead isn't easy. Data pours in from multiple systems, divisions and regions, and it is more real-time than ever before. IT departments are challenged to provide solutions that enable productivity and agility in the face of market and consumer demands. Manual processes, inefficiencies and lack of accountability add to the mix. Companies need IT investments that will help them reengineer decision-making processes so management can gain rapid insight into the business and people can make informed decisions.

IBM Business Analytics software delivers complete, consistent and accurate information that decision makers trust to improve business performance. A comprehensive portfolio of business intelligence, advanced analytics, predictive analytics, financial performance and strategy management, and operational planning and forecasting gives manufacturers clear, immediate and actionable insights into current performance and the ability to predict future outcomes.

IBM Business Analytics offerings, including Cognos® and SPSS® software, allow manufacturers to leverage new intelligence to create sustainable and competitive advantages. IBM business analytics and performance management solutions provide an enterprise planning, financial consolidation, business intelligence (BI) and modeling platform that helps companies plan, understand and manage financial and operational performance.

With core capabilities including reporting, predictive analytics, dashboards, planning, forecasting, scorecards and more, companies can understand performance and make better decisions.

With trusted, accurate and timely information delivered to the right decision makers at the right time, manufacturers can optimize business performance.

With critical insight across the business, they can also improve service levels, gain visibility into revenue and profitability performance, control costs and better manage their extended and complex supply chains.

This white paper highlights how business analytics and performance management can help you meet demand, increase customer and product profitability and be more operationally efficient. It also examines four focus areas where using IBM Business Analytics software can help you gain rapid insight, return on investment, and the quick wins needed to stay competitive.

Manufacturing performance management defined

To stay ahead in a competitive marketplace, you need to spot trends, optimize operations and make informed decisions quickly. With business analytics and performance management, manufacturers gain access to the reliable, timely information that drives better decisions. IBM Business Analytics software integrates and leverages your financial and operational data and allows your organization to employ the following capabilities to answer your critical business questions:

Dashboards and scorecards

IBM Cognos Business Intelligence software communicates your strategy and objectives through metrics-based scorecards and dashboards.

It provides managers with the information they need to take ownership of their performance: visibility into strategy, an understanding of the part they play in making the strategy succeed and the metrics to measure their success.

Use Cognos scorecarding and dashboards to:

- Aggregate operational data from multiple silos, diverse business lines and regions, from across the organization
- Link strategic and financial goals to operational metrics
- Measure performance against strategic company initiatives
- Gain a high-level overview of performance across key areas such as inventory, supply chain, quality control and fulfillment
- Monitor operations or supplier performance by a specific metric, such as on-time delivery
- Track financial goals in terms of growth, profitability, key controllable expenses and return on net assets

Reporting and analysis

Consolidating the large data volumes your organization amasses is a huge challenge. It is especially difficult given that there are also many tools used to analyze and report on the data, creating more islands of information.

IBM Cognos Business Intelligence software includes reporting and analysis to consolidate your critical data and turn it into meaningful information and reports that everyone can use. You can quickly spot trends and drill down to discover underlying causes and issues.

The flexible, user-friendly reporting means everyone has the right information delivered in the right way—across all departments, locations, functions and roles.

With a single, standardized BI platform for reporting and analysis, you can accurately assess the “Why?” behind operational activity and performance. This provides the necessary context for making decisions.

Use Cognos reporting and analysis to:

- Analyze sales to understand demand, optimize staffing levels and enhance operations
- Identify the processes and operations that generate unfavorable operational and financial variances
- Reconcile inventory, production and demand information to meet customer requirements
- Report on performance by department, employee, machine, customer, supplier and operation
- Reassess and optimize the product mix for a specific region

Predictive analytics: Anticipate and respond with more precision

IBM Business Analytics software solutions also include IBM SPSS Predictive Analytics software, which helps manufacturers predict future events and proactively act upon that insight to improve performance.

Manufacturing companies can shift to a smarter, fact-driven enterprise by applying advanced analytics to an integrated set of information. Analytics and optimization can help your organization predict the likely impact of actions to improve decision making and see what you previously couldn't.

Manufacturers that capitalize on predictive analytics are achieving new breakthroughs in business process improvements and cost efficiency. These organizations are using insight and innovation to strategically position themselves to capture market share. Our advanced innovative research in data analytics and optimization helps us to establish a proactive, rather than reactive, strategy to enhance performance and improve operational efficiency.

Predictive analytics help manufacturers anticipate change so that they can plan and carry out strategies that improve results. By applying predictive analytics solutions to data you already have, your organization can uncover unexpected patterns and associations and develop models to improve operational performance.

Optimization solutions for complex supply chain, risk management and marketing investments, for example, can mitigate risk, transform business processes and predict outcomes with greater certainty.

Use predictive analytics to:

- Predict when and how an asset is going to fail
- Predict appropriate inventory levels throughout the supply chain
- Predict product quality failures
- Quickly determine root-cause analysis

Budgeting and planning

Many manufacturers still use spreadsheets for financial planning and budgeting. Spreadsheet-based systems create islands of data, where everyone works independently.

A more effective solution is one that replaces a fragmented process with continuous, collaborative planning that supports your business drivers and delivers up-to-date insight into performance.

Cognos software helps you to address the question “What should we be doing?” by allowing you to set strategic initiatives and turn them into discrete plans and budgets for the entire enterprise—from central office to plants, and marketing to distribution centers.

Use Cognos planning software to:

- Develop long- and short-range financial, cost center and headcount plans, forecasts and budgets across the enterprise
- Gain consensus, and consolidate top-down and bottom-up operational plans with financial plans
- Increase accountability across the organization through a high-participation planning process
- Support timely updates of forecasts to address changing market influences, new initiatives and competitive factors
- Manage key plans like sales and operations planning (S&OP) with flexible, connected software to reconcile sales and demand forecasts with supply chain and production plans, and test multiple cost scenarios

With integrated plans, BI reporting and analysis, and performance metrics, you can dramatically improve your understanding of your organization, as well as your ability to make timely and informed decisions that improve operations, increase sales and drive profitable growth.

Increasing operational efficiency

Manufacturers must respond to market trends and economic challenges by improving internal operations to ensure that the entire organization is running at peak efficiency. This requires an in-depth understanding of how well the company is operating relative to its historical trends, its peers and the overall market. To gain this insight, your company needs the ability to connect operational details to business drivers to strategic goals.

Scorecarding, for example, is a valuable application for finding new efficiencies. With scorecards, companies can distill information into a small number of metrics and targets to immediately see how they are performing.

A dynamic marketplace also presents manufacturers with a business problem: how to match product demand with production and supply chain capabilities.

Organizations need enterprise forecasting and planning capabilities to effectively coordinate both market needs and the capabilities of the business. In this case, S&OP becomes the basis for aligning sales, marketing, supply chain and finance.

An effective S&OP process:

- Links day-to-day operations with business goals, operational planning and financial planning
- Helps model the effect of meeting demand on the company's supply capabilities and financial goals
- Provides visibility into the P&L impact of plans
- Becomes the tool for senior executives to manage the business and customer demand, but also look at the most cost-effective way of meeting that demand

With Sales & Operations solutions from IBM, you can integrate planning activities across finance, operations, production, purchasing, sales and marketing.

Using a common platform and workflow, departments coordinate their sales and production plans. Sales and marketing forecast product demand and revenue, and plan campaigns.

At the same time, schedulers carry out capacity, cost and throughput modeling of products and plants to determine the right combinations. Meanwhile, the supply organization evaluates supplier capabilities in-line with materials and build plans.

Once they're rolled up the information, management and finance teams review, analyze and align plans with corporate goals and objectives. Using this coordinated process, it's much easier to reconcile sales and demand forecasts with supply plans and financial goals.

There is also more time for analysis and rolling forecasts. Since the business can quickly adjust plans and targets as needed, it stays on top of market changes or new opportunities and issues such as supply chain disruptions.

S&OP analytics

The IBM Cognos S&OP Blueprint provides organizations with a 'quick-start' template for success. These models give demand planners the ability to drive to a consensus demand plan, supply chain planners the capability to drive to optimized supply and production plans, and financial planners the ability to immediately review the financial impact of operational decisions.

The blueprint provides:

- **Collaboration:** Alignment of different teams in the organization around a common plan
 - Streamlined reconciliation with company-wide strategic financial plans, managing consistency between top-down and bottom-up plans
 - A visual scorecard to display the status of the planning process, so that appropriate actions can be taken to complete it
 - Alerts so that approved plans are communicated to stakeholders, ensuring they are aware of initiatives that will impact S&OP
 - Integrated operational and financial planning for immediate insight into resource requirements and future consolidated business results for various scenarios
 - Real-time calculations of results, workflow and reporting to enhance collaboration and to manage and consolidate plans.
 - Text annotations further improve collaboration
 - **Modeling:** What-if modeling — allows managers to perform multidimensional and multi-scenario analysis to test the impact of different scenarios
 - Methods to identify variances between different versions of the plan
 - Methods to identify production constraints, overcapacity problems, trends, anomalies, and opportunities, and model the effect of drivers against various scenarios
 - Ways to understand the impact of increased or decreased production volumes on inventory, revenue, income statement, cash flow and balance sheet. Custom dating capabilities with no limit on time dimensions
 - Plans by week, period, quarter, or year
 - Scalable architecture with proven deployments
 - **Ease of use:** Various systems of record to obtain both projected and historical volumes, as well as financial data needed as a starting point for the planning process
 - Plans at multiple levels (including time, product hierarchy, region, and production facility) with the ability to allocate targets for production, revenue and expenses from across these levels
 - Web- or Excel-based deployment of models for data collection and consolidation with easy version control
 - Drop-down validation lists to ensure data consistency
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Improving maintenance and quality

According to a recent Aberdeen Asset Management report, when executives were asked about which risks had the biggest impact on operations, the #1 item stated was “failure of critical assets”.¹ Fundamentally, organizations lack not only visibility, but also predictability, into their assets’ health and performance. Maximizing asset productivity and ensuring that the associated processes are as efficient as possible are key aspects for organizations striving to gain those strong financial returns. Capital equipment utilized in production facilities is subject to high costs and unplanned downtime. While companies have a great deal of data on maintenance history and cost, as well as utilization data, it is difficult to accurately predict the combination of operating characteristics that lead to failure. Predictive maintenance is key. Predictive maintenance is different than preventative maintenance or condition monitoring, because predictive maintenance takes into consideration usage, wear and environmental factors of the asset to predict its failure.

The insights regarding when assets will fail and why are key inputs into quality, S&OP, spare parts inventory, and financial planning processes.

Predictive Maintenance and Quality

IBM Predictive Maintenance and Quality, IBM’s latest packaged offering, enables organizations to:

- **Monitor, maintain and optimize assets for better availability, utilization and performance.** Gain better visibility into the asset via real-time monitoring, mobile, decision management, and predictive analytics capabilities.
- **Predict asset failure to optimize quality and supply chain processes.** Predict asset or part failure by extending predictive analytics from the asset to its associated processes, such as quality and inventory, providing insights for both assets and processes.
- **Remove guesswork from the decision-making process.** Optimize decisions within resource constraints by visualizing issues and enabling quick and accurate execution of recommended actions, ultimately maximizing outcomes for the organization.

IBM Predictive Maintenance and Quality combines text and structured, streaming and at-rest data from disparate sources and automatically detects failures before they occur, enabling preemptive deployment of maintenance and repair resources and dramatically saving downstream costs. It leverages such technology enablers as master data management, analytics, workflows, and dashboards, as well as integration with Enterprise Asset Management and ERP systems, to ensure the right visibility and decision making.

Smarter supply chains

Global supply chains hold big potential for production, cost management and efficiencies. Orchestrating the chain, however, requires more than just mastering logistics. A recent executive report by the IBM Institute for Business Value — “[New Rules For a New Decade](#)” — points to new rules to optimize supply chain performance:

1. Know the customer as well as yourself. Smooth volatility with predictive demand.
2. See what others do not. Unveil visibility with collaborative insight.
3. Exploit global efficiencies, and enhance value with dynamic optimization.

Visibility

Performance management and business analytics provide organizations with complete visibility into and across their supply chains. It brings together data residing in different systems and at multiple levels of granularity.

Managers can monitor performance at the global level, analyze performance across processes, products or suppliers and dive down to transaction-level detail. They can identify key metrics, measure performance and receive alerts when performance is off track, allowing them to make immediate corrections.

Predictability

With Cognos Business Intelligence and SPSS software, future results become more predictable. Through regular reporting and analysis, managers can identify events, trends or other conditions that lead to problems. This helps them become proactive and eliminate problems before they occur.

Managers can analyze trends in operations, and build financial models and sales forecasts that help them make better decisions about resources and suppliers, as well as new products. Companies can also take preemptive action to prevent inventory shortfalls, delays and other events that hurt performance.

Complete and connected information

IBM Cognos BI and TM1 provides managers, partners, suppliers and customers with the complete and consistent information they need to produce meaningful and actionable analysis. Reports, analysis and other information can be distributed through a centralized portal or extranet.

Effects of decisions can be evaluated so people understand the cost-to-serve and make better decisions. Complete, connected information enables better collaboration. If a flaw or delay is identified, managers, suppliers, partners and customers can be alerted, allowing them to work out a collaborative solution.

Supply chain analytics

Benchmarking allows you to compare the metrics of a process or method against an industry standard or best practices from other companies.

Cognos scorecards support the Supply-Chain Operations Reference (SCOR) model developed by the Supply Chain Council. The SCOR model provides a framework that links processes, metrics, best practices and technology to improve supply chain management.

The IBM supply chain analytics solution provides:

- A comprehensive metrics approach that includes a predefined metrics database and impact diagrams
- Standard performance reports and analytics, as well as alerts
- Insight into underperforming metrics
- Defined metrics ownership and responsibility

Reliable financial planning

Becoming a leaner organization means swapping out inefficient processes in favor of new systems capable of driving ongoing performance.

It is becoming increasingly important to align financial forecasting with the business cycles that prevail in your key markets. By replacing rigid annual budgeting with continuous planning—on a monthly, weekly or even daily basis—you can position your organization to achieve higher performance in both good times and bad.

With real-time visibility into up-to-date data, your decision-makers can create rolling forecasts that take a broad range of potential future scenarios into account. Using predictive analytics, business leaders can also develop action plans for variable future outcomes, increasing business agility and responsiveness.

IBM Cognos financial performance management

Cognos software provides a complete planning, budgeting and analytics environment to help you deliver timely, reliable forecasts and plans. You can rapidly analyze and model planning requirements for your entire organization, and use them to anticipate the correct course of action for better business outcomes. The solution supports a full range of business requirements, from high-performance, real-time financial analytics, such as for customer and product profitability, and flexible modeling, to enterprise-wide contribution from all business units. Cognos software:

- Reduces planning cycles by 75 percent and reporting from days to minutes
 - Is owned and managed by finance and lines of business
 - Provides exceptionally fast performance for large, sophisticated models and large data sets
 - Features personalized planning and analytics — within a managed planning process — to explore performance gaps and validate corporate drivers
 - Provides a flexible modeling environment that requires no programming or traditional IT skills
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Summary

Decision making happens at every level, in every function, in every region of your organization. Every one of those decisions is based on the information people have on hand. If that information is on target and reliable, timely and easy to consume, better decisions result. Information that is inaccessible or incomplete, late or inaccurate has a direct and negative impact on decision making, and ultimately, business performance.

This paper summarizes four ways that manufacturers can succeed with business analytics and performance management. IBM is enabling manufacturers to react quickly to changing markets, operate more efficiently and continue to pursue growth by helping them gain deeper insight into markets, operations and customer demand.

IBM Business Analytics software allows users to leverage existing investments from multiple sources, and delivers the full range of integrated capabilities business users need to monitor the business, make better decisions and plan for better business outcomes. When the going gets tough, the tough need insight. That's why leading manufacturing organizations turn to IBM. For more information on IBM analytics solutions for manufacturing, please visit ibm.com/software/analytics/manufacturing.

Analytics in action

Preventive maintenance in action: Motorcycle manufacturer

By adding predictive maintenance capabilities to its warranty claims, a leading motorcycle manufacturer reduced the time to detect quality issues from days and weeks to minutes and hours, thereby significantly reducing maintenance costs. In addition, the company was able to proactively address warranty issues and identify and address equipment anomalies several months before the riding season.

Becker Underwood

“Our investment in business intelligence and analytics has really paid dividends for our company. The forecasting and planning processes between our operations and sales teams now run much more seamlessly, and the real-time information that is available to us is invaluable in running our business efficiently. These are innovations that we have come to rely on, have adopted quickly, and have become an integral part of our company.”

— Peter Innes, Chief Executive Officer, Becker Underwood

Brammer Group

“IBM predictive analytics technology has helped us dramatically streamline our inventory by creating stock profiles based on customers' buying patterns. This enables us to forecast more efficiently what we need in stock and in what quantity, contributing to a GBP31.1 million inventory reduction.”

— Yongli Ge, Senior Logistics Analyst, Brammer Group



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1 Aberdeen Group. Asset Management: Building the Business Case for the Executive. Dec 2012



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