Supply Chain Business Intelligence

Adoption, Use and Practices

White Paper
sponsored by

VENTANA
RESEARCH

Aligning Business and IT to Improve Performance

Ventana Research Headquarters
1900 South Norfolk Street, Suite 280
San Mateo, CA 94403
info@ventanaresearch.com
(650) 931-0880

Ventana Research Europe
2nd floor, Berkeley Square House
Berkeley Square, W1J 6BD London
europe@ventanaresearch.com
44 (0) 20 7887 6012

MEDIA SPONSORS

San Mateo, California
April 2007

Ventana Research performed this research for a fee to determine the needs and practices of organizations that use business intelligence (BI) technology in the supply chain. This document is based on our research and analysis of a quantitative survey administered via the Web to qualified respondents. Qualification was based upon use or intended use of business intelligence technology to create supply chain-focused BI and/or analytical applications.

This research was designed to investigate the practices and needs of individuals and organizations that use or wish to use BI applications specific to the supply chain. This research is not intended for use outside of this context and does not imply that organizations are guaranteed success by using only these results to improve organizational productivity. Moreover, gaining the most benefit from your supply chain BI applications, whether custom-built or vendor-developed, requires an assessment of your organization's unique needs.

We certify that Ventana Research wrote and edited this report independently, that the analysis contained herein is a faithful representation of our evaluation based on our experience with and knowledge of supply chain BI applications, and that the analysis and conclusions are entirely our own.

Table of Contents

Executive Summary 5
Key Insights 8
Customer service and visibility of inventory are driving initiatives. 8
Companies use supply chain BI to manage demand. 8
Most companies will use supply chain BI in most functional areas. 8
Most organizations are not very mature in use of supply chain BI. 8
Projects take time. 9
Key Metrics can be hard to come by, not timely and sometimes incomplete. 9
Spreadsheets and in-house applications remain in wide use. 10
Users want dashboards 10
Access to data remains difficult. 10
Multiple systems create difficulties for supply chain BI. 10
Integration with financial and forecast data is an important but unmet need. 11
Companies need to automate data transmissions from partners. 11
What To Do Next 12
Assess your maturity and take steps to improve it. 12
Expand deployments beyond direct supply chain users. 12
Measure the performance of your processes. 12
Use supply chain BI to improve your Balanced Scorecard. 13
Integrate plans, schedules and forecast data. 13
Use advanced BI technologies to improve decision-making. 13
How Ventana Research Can Help 15

Executive Summary

Ventana Research views business intelligence (BI) as a key enabling technology for effective performance management. BI technology provides quantitative data and tools to manipulate it so users can perform business analysis that supports decision-making. Large and midsize businesses have invested many millions of dollars in BI software implementations as they strive to provide more business users with access to information that will improve the company's results.

This research study explores the adoption and use of business intelligence technology, assessing how executives in the various functions of manufacturing and supply chain operations view it and the role it is playing, or should play, in their organizations. Ventana Research undertook this study to evaluate the market, to determine organizations' maturity and to identify trends and priorities in their adoption.

We promoted the study through our media partners in North America and around the world. It elicited a high level of response, allowing us to base our findings on analysis of 427 validated responses. The qualified respondents evenly represent companies whose annual revenues span from less than US$100 million to more than US$1 billion. Every significant industry is represented. In terms of people, the size of the companies represented ranges from 100 to more than 10,000 employees. The respondents themselves came from various parts of their companies, including executive management, operations and information technology.

Our survey defined supply chain BI analytics and applications as specific combinations of BI technology created to support business processes such as inventory visibility, commodity spend and customer profitability. BI technology includes dashboards, scorecards, reports, predictive analytics and ad-hoc query tools, online analytical processing (OLAP) cubes, metadata, database schemas, extraction, transformation and loading (ETL) scripts and data warehouses.

We divided our survey questions into four categories, focusing on the people, process, information management and technology aspects of supply chain BI, and we evaluated the maturity of organizational deployment and use of BI from each of those perspectives. The Ventana Research Maturity Model™ categorizes and evaluates maturity at four levels: Tactical, Advanced, Strategic and Innovative. Overall, we found companies that practice or will practice supply chain BI do so at either the Tactical or Advanced level. We identified only 9 percent of respondents' companies that could be considered Innovative. These Innovative companies use supply chain BI not only to manage their supply chain processes but also to help manage their demand-shaping activities. This research makes clear that as a whole – across all the elements of supply chain BI – most companies have substantial room for improvement.

This research also reveals that improved customer service and inventory visibility are the goals driving supply chain BI initiatives. Choosing from among an array of business improvement results, companies told us they are looking to apply BI primarily to sharpen the accuracy of forecasting, reduce costs, reduce inventory levels and better understand the drivers of customer demand. This finding is confirmed by the fact that the majority of reporting companies said supply chain BI currently is or will be used to support demand planning, customer account

management and sales and operations planning. Even though companies intend supply chain BI to reduce inventory and costs, the evidence shows that they are primarily intent upon using supply BI to improve forecasts and demand management.

In general, we find that supply chain BI projects take time, typically more than six months. The relative slowness of implementation projects is caused mostly by two important but time-consuming tasks for IT: developing a detailed understanding of operational data sources and defining business users' requirements. The most time-consuming task for business users was confirming the accuracy and consistency of data. Confirming the accuracy of data is consistent with the time spent by IT in developing data sources, because many of the requirements are dependent on what data is available and where it is located. Confirming the data's accuracy is undoubtedly a companion project

Our survey also explored what metrics respondents have access to or work with. We did this because we wanted to know what performance measures (like profit, process and forecast accuracy) companies considered important to supply chain BI. Slightly less than half of the respondents said that they have access to critical metrics such as profitability and process data. These results are somewhat contrary to the results showing what functional areas are using supply chain BI, where we see the most use by finance groups and executive management. We find the lack of access to process data particularly troubling. BI is a critical tool for analyzing business process information. Without that, it's virtually impossible to measure, evaluate and control business processes.

Ventana Research believes that to connect processes with performance goals, companies need business intelligence capabilities, including metrics, key performance indicators (KPIs), executive dashboards and advanced reporting. They must go beyond just providing reports of basic operational metrics to facilitating access to aggregate data definitions and real-time information. Without BI, it is impossible to correlate process outcomes to corporate performance goals or to apply operational metrics to continuous process improvement.

Our survey finds that nearly half of most companies' supply chain BI technology is spreadsheets or other desktop applications, and nearly one-third of respondents use applications developed in-house. The problems associated with these technologies include sourcing, organization and verification of data, all of which may be solved by replacing them with dedicated applications from qualified vendors. This finding is reinforced by the large group of users who said they are very well satisfied with supply chain BI tools supplied by BI vendors.

We uncovered difficulties with data access in numerous ways, including the length of time it takes to obtain information and a lack of integration between various systems serving parts of the supply chain or elements in the company's product mix. At the same time, the research reveals a solid need for real-time data acquisition and reporting. Barriers we found to easy, quick data access include unwieldy user interfaces, disparate data warehouses, multiple systems within the supply chain and overuse of spreadsheet technology for supply chain BI analysis. Ventana Research believes that real-time supply chain information no longer need be a distant ideal but is a realistic objective and a key tool in a company developing a lean supply chain, which we define as a set of organizations and processes that are linked in a

continuous flow of products and services, finances and information, and that interact collaboratively to reduce cost and waste

This research reveals that the use of multiple, overlapping systems creates difficulties for supply chain BI. Respondents told us that the most desirable feature of supply chain BI systems is simplified data integration from all sources. At the same time, they said that multiple instances of supply chain systems make data integration difficult.

This research also finds integration with financial and forecast data to be an important but unmet need. Nearly all respondents in this study said it is important to integrate forecasts, plans and other time-phase data with supply chain data for BI purposes. Additionally, 90 percent said integrating financial data and financial metrics for their supply chain BI is important. Yet only half of the respondents (53%) said that time-phase data is actually integrated in the supply chain BI applications they are currently using.

This integration is a must if companies are to measure the accuracy of forecasts properly. Proper forecasting has a major impact on the ability of a company to satisfy its customers and simultaneously to manage its resources. Effective forecasting helps management resolve the dilemma of providing better customer service with fewer resources. Ventana Research recommends that companies evaluate the data integration capabilities of dedicated BI platform vendors to correct this pernicious problem.

Finally, our research reveals a need to automate transmission of supply chain data from partners. More than one-third of companies reported that this data is transmitted to them using manual methods such as fax and telephone, and another one-third reported that it is transmitted using semi-automated methods such as spreadsheets and Web portals. Having such a large volume of data that requires manual entry into the supply chain BI systems runs contrary to meeting the need respondents reported for real-time and intraday data updates.

Manual data acquisition will seriously hamper the development of an efficient lean supply chain in which real-time understanding of customer demand triggers the entire manufacturing process. Ventana Research recommends that companies seeking to become more demand-driven, responsive and customer-oriented automate their trading partner data, especially where responsiveness coincides with the need to eliminate delays in supply performance metric calculations.

Key Insights

Customer service and visibility of inventory are driving initiatives.

The most valuable benefits from supply chain BI reported by study respondents involve customer satisfaction [Q26]. Top-ranked choices include improved customer service and improved inventory visibility, which is the ability to know the location and status of the physical components, from raw materials to finished goods, as they move from suppliers through the stages of production to delivery to customers.

The second-ranked benefits involve improved company performance, which is almost certainly tightly linked to customer satisfaction. Results show that companies most often plan to supply BI to increase the accuracy of forecasting, reduce costs and inventory levels and better understand the drivers of customer demand. All are key performance management elements that are excellent proof points for implementing supply chain BI.

Companies use supply chain BI to manage demand.

Consistent with the business drivers, the top use for supply chain BI is to understand the demand picture [Q7]; 84 percent of respondents said supply chain BI currently is or will be used to support demand planning. Customer account management ranked second, and sales and operations planning was fourth, still selected by more than three-fourths of respondents. Even though the second strongest intended application of supply chain BI is to reduce inventory and costs, the data shows that companies primarily are intent on using supply chain BI to improve forecasting and demand management. These findings also indicate that companies want to improve their understanding of the relationship between customer purchases and product supply as a way to improve revenue generation.

Most companies will use supply chain BI in most functional areas.

Nearly two-thirds of respondents currently have or in the next 12 months will have a supply chain BI initiative under way [Q6]. While most respondents said that Finance has the strongest interest in this technology, cumulatively they asserted that nearly every other functional area sees business value in analyzing the supply chain using BI technology [Q9]. More than half said Finance already uses supply chain BI technology, and more than half said the same of executive management and procurement managers.

In terms of how many users will be served by supply chain BI technology now and in the future, respondents said that more will use the technology in a year, and even more will at full deployment sometime after that. More than one-fourth of respondents reported 100 or more users currently being served in their company, and 40 percent expected that many at full deployment.

Most organizations are not very mature in use of supply chain BI.

As part of this study, Ventana Research evaluated the maturity of supply chain BI use. We find that two-thirds of companies operate at the two lowest levels (Tactical or Advanced) of the four levels of maturity. These companies are at the earliest stages of using BI to manage their supply chain processes; they deploy supply chain

BI applications to relatively few departments outside those directly involved with supply chain activities. Only 25 percent could be considered Strategic, the third level of maturity, and only 9 percent could be considered Innovative. Companies at these maturity levels use supply chain BI not only to manage their supply chain processes but also to help manage demand-shaping activities. Supply chain BI is deployed in Finance, Purchasing, Sales and Marketing. They use the information to improve coordination of new product introductions, promotional events, supplier performance and financial metrics.

The maturity of organizations does not vary significantly by company size as measured either by number of employees or annual revenue, or whether a company is domestic or international. Nor is there much differentiation in deployment by industry sector.

Projects take time.

Only 16 percent of participants said their project took less than six months to complete. The prolonged implementation of projects is driven by two important but time-consuming tasks. Nearly one-third of respondents said that their IT departments had spent most of their time developing a detailed understanding of operational data sources [Q10]. A similar number reported that the most time-consuming task for business users was defining requirements [Q11], while 21 percent said that the most time-consuming task for business users was confirming the accuracy and consistency of data. The first of these results corresponds to the time spent by IT in developing data sources, because many of the requirements are dependent on what data is available and where it is located. We conclude that that confirming the data's accuracy is a companion project to supply chain BI.

Key Metrics can be hard to come by, not timely and sometimes incomplete.

Less than half of the respondents reported that they had access to profitability and process data as supply chain metrics. These results are somewhat contrary to the results showing that among functional areas using supply chain BI finance groups and executive management are the greatest users. Additionally, one-third reported that it is not easy to gain access to key metrics, and 39 percent of them said that is because it either takes too much time to correlate the underlying numbers or they don't have dashboards or other BI software that is easy to use. One-fifth (20%) said that the team managing the BI system gave access to key metrics a low priority.

This lack of access to process data is troubling. BI is a critical tool for analyzing business process information. Without it, it's virtually impossible to measure, evaluate and control business processes. Ventana Research believes to connect processes with performance goals, companies need business intelligence capabilities, including metrics, key performance indicators (KPIs), executive dashboards and advanced reporting. Companies must go beyond just providing reports of basic operational metrics to facilitating access to be able to correlate process outcomes to corporate performance goals and apply operational metrics to assure continuous process improvement.

Spreadsheets and in-house applications remain in wide use.

Nearly half of respondents said that at least some of their company's supply chain BI technology is spreadsheets or other desktop applications, and nearly one-third use applications developed in-house [Q12, Q13]. The problems associated with these technologies include sourcing, organization and verification of data, all of which may be solved by replacing them with dedicated applications from third-party vendors. Additionally, the largest group of very dissatisfied supply chain BI analysis users is those who employ spreadsheets to do the work. In contrast, the largest group of very satisfied users of supply chain BI analysis tools is using products provided by dedicated business intelligence vendors [Q17]. The former result represents an opportunity for further BI technology adoption.

Users want dashboards

When asked to identify the most important technology features for users of supply chain BI applications [Q28], respondents placed at the top of their list of choices dashboards. In fact, dashboard technology was the number two first choice (next to reporting) and the number one second choice. Dashboards are reporting tools that consolidate, aggregate and arrange measurements or metrics (measurements compared to a goal) on a single screen so the information can be monitored at a glance. Dashboards contribute significantly to the benefits of supply chain BI because they can be tailored to fit a specific organization role (such as an executive or line worker) or generate metrics reflecting a particular point of view (operational or financial, for example).

Access to data remains difficult.

Respondents reported numerous difficulties with data access, including the length of time that it takes to obtain information [Q22] and a lack of integration between systems serving various parts of the supply chain or elements in the company's product mix [Q42]. At the same time, respondents reported a solid need for real time data acquisition and reporting. Our analysis of the timing needs of data for various supply chain operations revealed that the operations that sit very close in the process to final demand, as well as manufacturing and warehousing operations, require real time data [Q32]. Many of those same operations were reported to require intraday or daily updates.

Ventana Research believes that real-time supply chain information is no longer a distant ideal but a realistic objective and a key part of to moving a company toward a lean supply chain. Barriers this study found to easy, quick data access include unwieldy user interfaces, disparate data warehouses, multiple systems within the supply chain and overuse of spreadsheet technology for supply chain BI analysis.

Multiple systems create difficulties for supply chain BI.

Almost one-third of respondents said that the most desirable feature of supply chain BI systems is simplified integration of data from all sources [Q29]. At the same time, three-quarters of them said that multiple instances of supply chain systems make data integration difficult [Q43]. Most respondents' companies have not yet begun initiatives to correct the integration problem caused by multiple system instances. Ventana Research recommends companies evaluate the data integration capabilities of the dedicated BI platform vendors to correct this pernicious problem.

Integration with financial and forecast data is an important but unmet need.

Nearly all of the respondents in this study said integrating forecast, planning and other time-phase data with supply chain data for BI purposes is important [Q33]. Additionally, almost all (90%) said it is important to integrate financial data and metrics for their supply chain BI [Q35]. The results underline the desire of managers to use supply chain BI to help their company deliver financial performance results as well as to smooth operations. However, only half of the respondents said that time-phase data is actually integrated in the supply chain BI applications they are currently using [Q34].

This integration is a must if companies are to do proper measurements of forecast accuracy. Forecasting has impacts the ability of a company to satisfy its customers and to simultaneously manage its resources. Effective forecasting helps management resolve the dilemma of providing better customer service with fewer resources.

This data integration shortfall also reinforces the need for business and IT to achieve better alignment about what should be included in supply chain BI. Prepackaged business intelligence software that is designed specifically to support supply chain management is virtually nonexistent. However, most BI products can handle supply chain-related issues, although significant configuration can be required to insure that business users' needs are fully met.

Companies need to automate data transmissions from partners.

More than one-third of respondents reported that supply chain partners transmit data to them using manual methods, such as fax and phone, and another one-third reported that it is transmitted by semi-automated methods, such as spreadsheets and Web portals [Q39]. Having such large volumes of data that require manual entry into the supply chain BI systems is a barrier to realizing the need that respondents reported for real-time and intraday data [Q32].

Manual data acquisition will seriously hamper the process of developing an efficient lean supply chain that triggers the entire manufacturing process through a real-time understanding of customer demand. Ventana Research recommends that companies desiring to become more demand-driven, responsive and customer-oriented automate their trading partner data transfer processes, especially where this coincides with the need to eliminate delays in supply performance metric calculations.

What To Do Next

Our research reveals that most companies are looking to use supply chain BI to gain inventory visibility, manage demand and improve customer service. Yet there are other benefits that many are not taking advantage of. Typically that's because there are some missing pieces – and they involve more than software. There are also people, process and information management issues that companies must address to improve their supply chains and gain competitive advantage.

Assess your maturity and take steps to improve it.

Many organizations adopt technology without understanding all the associated requirements that will enable their people and processes to use it effectively. Companies that our research rates as Innovative avoid this mistake. They have moved beyond merely using supply chain BI for reporting basic data such as inventory turns or supplier costs. Instead, Innovative companies have deployed supply chain BI to address customer-facing issues and revenue-driving activities. Midsize and large businesses in any industry can adopt this technology combination to improve decision-making and provide a superior interface of supply chain or trading partner information. Using our Maturity Model, compare the maturity of your organization to that of your industry, and use this benchmark to determine your strategy and steps to implement it. Determine the ability of your BI technology providers to add supply chain BI, and look for areas where you can leverage supply chain BI to extend the value of your investments.

Expand deployments beyond direct supply chain users.

Our research concludes that only 10 percent of companies can be considered innovative in the way they share supply chain BI information across the organization. Most report minimal cross-functional use. Supply chain BI at a basic level is used solely for supply chain departmental business. This deployment is too narrow to allow a full return on investment. We recommend that companies expand the scope of their supply chain BI to include members of executive management and Finance, Sales, Marketing, Engineering and Product Development.

We also recommend that you identify the strategic importance of supply chain BI. One way is to create a cross-functional team responsible for defining the common supply chain measures and metrics that will be used across the organization. Executives and front-line employees, not just middle managers, should use those metrics to measure supply chain performance.

Driving the cultural change that is necessary to support a formal, integrated use of supply chain business intelligence requires a sponsor who has broad and deep influence across the organization. Companies should engage the COO, general manager or CFO as the primary sponsor of their supply chain BI initiative. Our previous research shows that the success rate of those that involve these executives is nearly double that of those that do not.

Measure the performance of your processes.

Our research shows that use of supply chain BI in a mature manner improves the likelihood of customer satisfaction. We recommend that you stop looking to the

supply chain only for improved data visibility or cost containment purposes and start considering supply chain BI in more strategic and innovative ways. Specifically we recommend that you expand use of supply chain BI to measure the effectiveness of the core supply chain processes. Your company can apply supply chain BI to transform itself into a demand-driven enterprise by making decisions about how the supply chain processes can make the company more effective (not just more efficient). Some ways to do that are to use supply chain BI to understand decision trade-offs, to improve new product introductions and product innovation activities and to better understand the drivers of customer demand and manage promotions trade spend. Truly innovative companies understand that supply chain BI will enable them to improve business efficiency and customer relationships. They expect that the business result will be greater flexibility to meet demand changes.

Use supply chain BI to improve your Balanced Scorecard.

The best way to measure process effectiveness is to organize your supply chain BI measures according to a standard performance measurement reference model. Reference models integrate the well-known concepts of benchmarking and process measurement. The best-known reference model for managing supply chain performance is the Supply Chain Operations Reference model (SCOR), created by the Supply Chain Council (http://www.supply-chain.org). This model contains standard descriptions of management processes and characterizes management practices and standard metrics that benchmark "best-in-class" performance.

Ventana Research asserts that an integrated, strategic approach is needed to propel supply chain operations to greater effectiveness and to provide the basis for consistent financial results. We recommend that all supply chain BI initiatives start with Balanced Scorecard measurements. We also recommend that SCOR results be displayed in the Balanced Scorecard business process perspective. By doing this, executives will be able to evaluate supply chain BI results within the company's performance management framework and manage within a proven reference model that provides linkages to strategic goals.

Integrate plans, schedules and forecast data.

Our survey finds that many users are dissatisfied with their supply chain BI information. Most users have access to only one or two types of static metrics such as cost or variance. Missing are the critical metrics that measure the accuracy of demand and supply plans and financial forecasts. Ventana Research recommends that you seek to improve your understanding of plan performance by using supply chain BI and analytic applications. We believe you will find business benefit in having access to forecasts and financial data integrated with supply chain data, in particular improving sales and meeting new customer demands.

Use advanced BI technologies to improve decision-making.

Our survey finds that most companies use only the basic BI components, which include reporting, dashboards and extraction, transformation and loading (ETL). We recommend these but also the use of the more advanced BI technologies including ad-hoc search, multidimensional cubes, business rules engines, workflow, business activity monitoring and alert notifications. These capabilities support multifactor analysis such as balancing bookings, billings, backlog or line-balancing. They also

help automate the exchange of supply chain information with trading partners. In some cases, event processing, guided or predictive analytics, visualization or geospatial technologies can improve insight. Applied in the right way, these technologies help to improve decision-making by automating the time-consuming task of analysis.

How Ventana Research Can Help

Ventana Research helps organizations develop, execute and sustain a Performance Management program that aligns people, process, information and technologies essential for success. As an objective, trusted advisor we are your insurance that your Performance Management initiatives drive immediate and long-term improvements to your business.

We offer a variety of customizable Performance Services to meet your specific needs including workshops, assessments and advisory services. Our workshops, led by analysts with more than 20 years of experience, provide a great starting point to learn about hot Performance Management topics – from Compliance to Business Intelligence to building a Performance Management strategy and driving adoption of best practices. We also offer tailored assessment services to help you connect the business and technology phases of your project by leveraging our research foundation and Performance Management methodology. We also deliver access to our analysts for trusted and objective advisory services on an as-needed basis to help you keep up with market trends, technologies and best practices.

Everything at Ventana Research begins with our focused research on Performance Management. We work with thousands of organizations worldwide – conducting research and analyzing market trends, best practices and technologies with the purpose of helping our clients improve the efficiency and effectiveness of their organizations.

Through our Performance Management Community, we also provide opportunities for professionals to share challenges, best practices and methodologies. Sign up for Basic membership to www.ventanaresearch.com and gain access to our monthly Performance Management newsletter and learn about upcoming educational and networking events – such as webinars, conferences and network roundtables – in your area. We also offer the following membership levels to view entire research notes for expert advice and recommendations:

Premium membership: For business and IT professionals* interested in full access to our research notes - including assessments of market impact and recommendations on technologies and trends.

Premium Plus membership: Get full access to research notes plus a two-hour inquiry with our analysts on your specific strategy, technology and implementation questions, as well as one research report and other exclusive content such as white papers and presentations.

To learn more about Ventana Research services – including workshops, assessments and advisory services – please contact clientservices@ventanaresearch.com.

Premium Community membership is for end-user professionals. Additional services are available for solution providers, software vendors, consultants and systems integrators.
The full research report, including the detailed maturity model analysis and question by question examination, is available for purchase through Ventana Research at 650-931-0880 or by contacting ***sales@ventanaresearch.com***. For a list of research available visit ***www.ventanaresearch.com/research***.