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The Keys to Capturing and Leveraging Actionable Information

Introduction

Supply chain capabilities in the digital age center on better information management and analytics. Use of transactional systems, disconnected planning tools, and reports summarizing historical trends may have been adequate for the supply chains of the past but are unlikely to meet the insights and optimized planning needed today.

While companies still need transactional systems for supply chain execution, capabilities in areas such as supply chain analytics are drawing interest from enterprises. Actionable information supported by advanced analytics, algorithmic planning, and software that makes use of artificial intelligence (AI) promise to move supply chains from being reactive to proactive and predictive. To better understand this progression, it's useful to know which information management capabilities supply chain professionals see as most important for the future, and the information gaps they are dealing with today.

This study's intent is to quantify the information and analytics needs of supply chain professionals, as well as the current state of their systems. Sponsored by Logility, Inc., a leading provider of collaborative supply chain optimization and advanced retail planning solutions, and conducted by Peerless Research Group (PRG), the study is based on a survey of 95 top supply chain executives who are readers of Peerless Media's *Supply Chain Management Review*. Among the issues the survey provides details on:

- the challenges executives face related to improving margins, raising customer service levels and leveraging information to make effective business decisions
- strategies for improving the accuracy and access to business-critical data
- the importance of business analytics to supply chain operations of today and beyond.

Key findings from the survey include:
- High interest in using software to improve customer service and attain a better grasp of demand. The second most important business strategy initiative among respondents, for instance, was "improving customer service," cited as a high priority by 70%, while on another question, meeting customer demands and maintaining customer loyalty tied with talent retention as the top "primary challenge" over the next two years.
- Momentum for advanced analytics, with 22% having implemented solutions, 27% currently evaluating or expecting to adopt analytics within a year, and another 33% beginning a needs assessment. Supply chain planning and forecasting, logistics management, and customer service improvements are the three top applications for which organizations plan to use advanced analytics.
- Continued reliance on spreadsheets and data integration concerns are two of the leading obstacles to advanced supply chain analytic solutions. For instance, 47% cite reliance on Excel for analysis as a hurdle to adopting advanced analytics.

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- Respondents commonly lack dynamic business intelligence software or analytic solutions for sales & operations planning (S&OP) initiatives. For instance, static pre-sentation software is used by 67% to convey S&OP data, and 60% use Excel, which may correlate to why only 10% rate their S&OP process as highly effective.

The technologies examined in this survey include terms like advanced analytics and algorithmic planning that merit brief definition. Advanced analytics differ from previous genera-tions of reporting/analysis tools in that they are forward-looking, whereas traditional reporting summarizes historical trends, often from a single database. Analyst firm Gartner calls this traditional approach to business intelligence "de-scriptive analytics," whereas advanced analytics may use artificial intelligence (AI) and AI variants like machine learning to find patterns from multiple data sources and make predictions.

Algorithmic planning differs from traditional planning by employing software logic or "algo-rithms" which consider multiple data sources to arrive at optimized plans in an automated way. These solutions may employ AI and be self-learning in nature—more akin to the algo-rithm Amazon uses to predict what a customer wants to buy next than the material require-ments planning (MRP) calculations used in supply chains for decades. In short, such solu-tion types can assess data from more sources and leverage today's immense computational power to make accurate predictions.
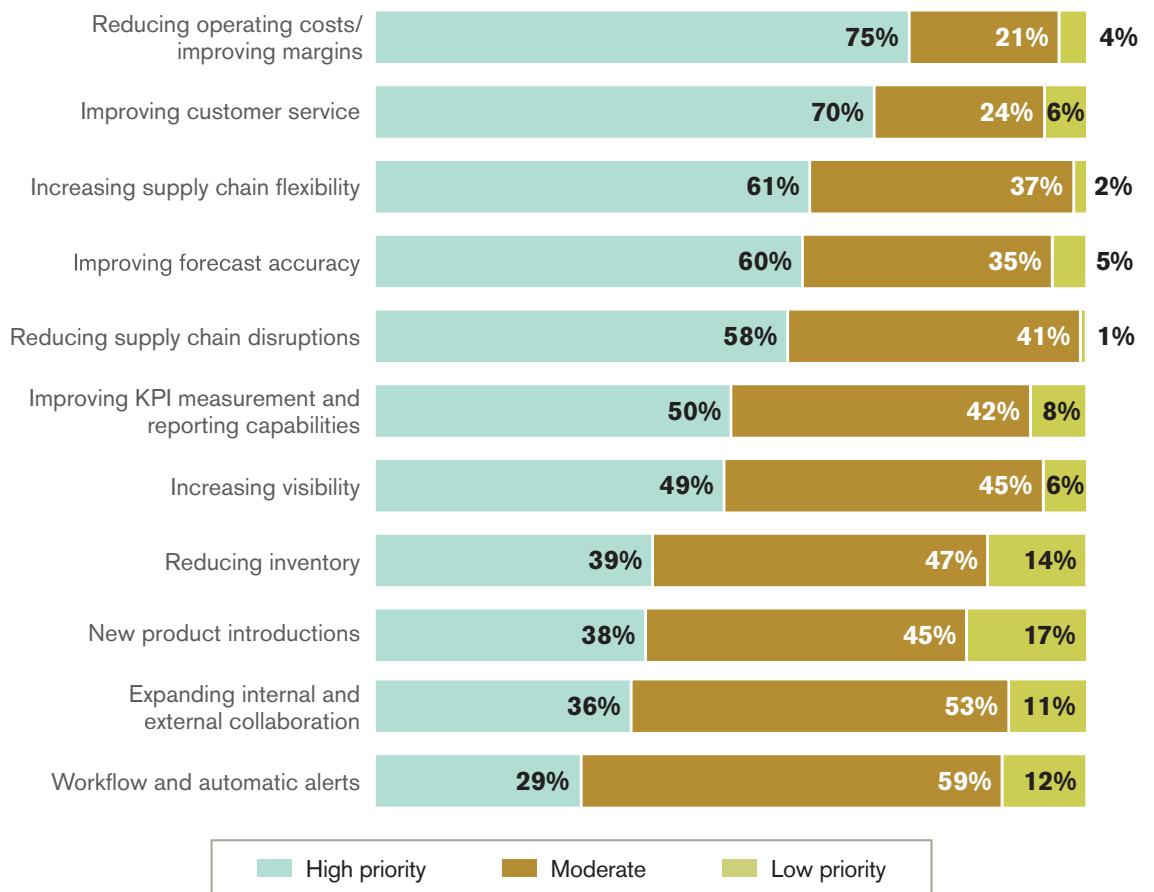
Organizations' Business Priorities and Challenges

In the upcoming months organizations will mainly focus on initiatives to improve margins and operational cost management as well as upgrading customer service. Further efforts to gain greater supply chain flexibility, refine forecast accuracy and minimize supply chain disruptions are also high priority programs. (Figure 1)

FIGURE 1

Initiatives considered most important to company's business strategy

Initiative	High priority	Moderate	Low priority
Reducing operating costs/improving margins	75%	21%	4%
Improving customer service	70%	24%	6%
Increasing supply chain flexibility	61%	37%	2%
Improving forecast accuracy	60%	35%	5%
Reducing supply chain disruptions	58%	41%	1%
Improving KPI measurement and reporting capabilities	50%	42%	8%
Increasing visibility	49%	45%	6%
Reducing inventory	39%	47%	14%
New product introductions	38%	45%	17%
Expanding internal and external collaboration	36%	53%	11%
Workflow and automatic alerts	29%	59%	12%

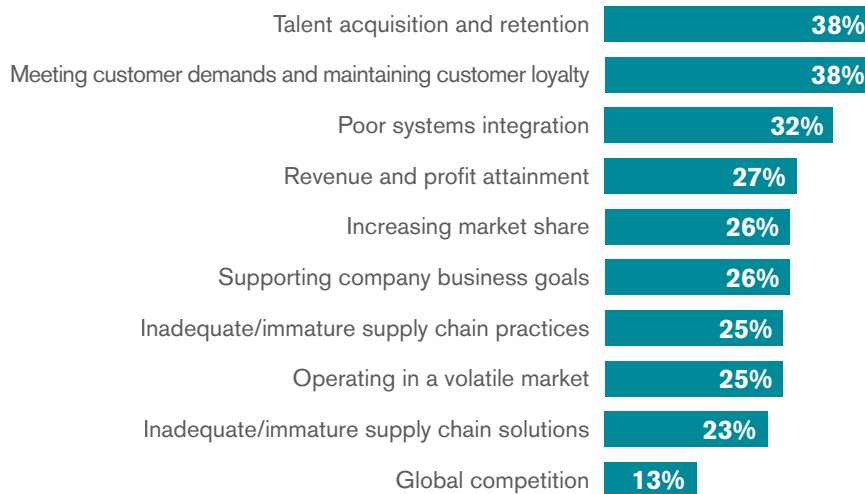Legend: High priority · Moderate · Low priority

While executives plan to concentrate on reducing operating costs and raising customer service levels, also standing in the way of businesses' efforts in accomplishing their objectives will be talent acquisition and retention concerns. In this growth economy, getting a better handle on demand and building customer loyalty also is a leading issue. With the difficulties organizations face in securing and keeping talented employees, a robust and agile supply chain platform which delivers solid predictive insights and presents actionable information can help mitigate problems and risks that might surface. A lack of systems integration is seen as another major obstacle by respondents. Analytics which systematically make predictions and elevate recommended actions, and are constantly

learning from data can be seen as a form of automation. Such automation is essential to prevent organizations from losing valuable information and keeping the stream of data accurate and flowing in the event of workforce turnover and subsequent loss of intellectual capital. (Figure 2)
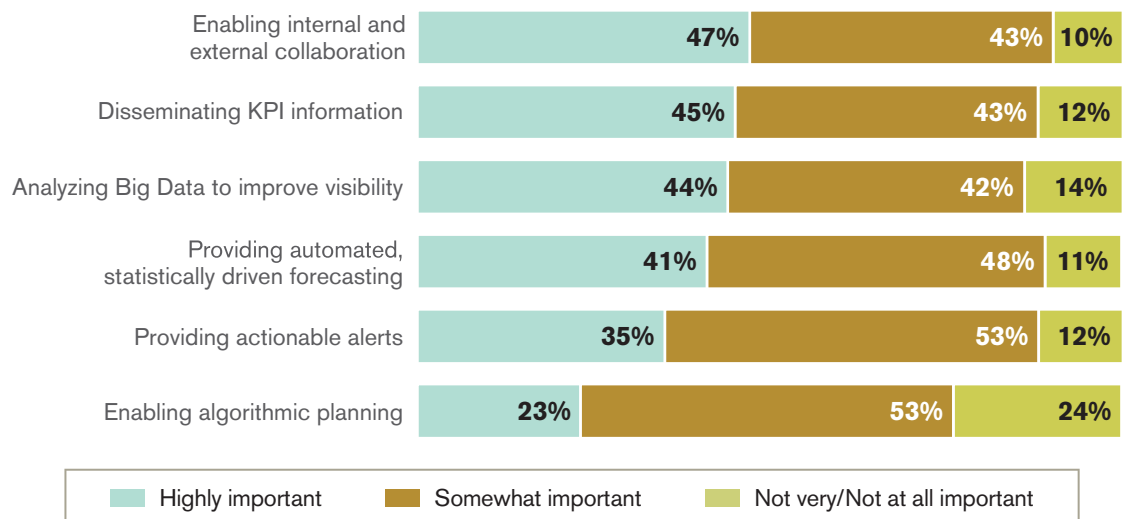
FIGURE 2

Primary challenges organizations will face over the next two years

Challenge	Percentage
Talent acquisition and retention	38%
Meeting customer demands and maintaining customer loyalty	38%
Poor systems integration	32%
Revenue and profit attainment	27%
Increasing market share	26%
Supporting company business goals	26%
Inadequate/immature supply chain practices	25%
Operating in a volatile market	25%
Inadequate/immature supply chain solutions	23%
Global competition	13%

The supply chain's capacity to enable improved collaboration among shareholders, distribute relevant KPI information to stakeholders, attain greater visibility through data analysis, and provision of statistically accurate forecasts, are considered keys to precise and actionable information. (Figure 3) Interest in visibility via Big Data analysis also suggests interest in solutions that can make predictions and recommend specific actions.

FIGURE 3

Supply chain capabilities considered most important

Capability	Highly important	Somewhat important	Not very/Not at all important
Enabling internal and external collaboration	47%	43%	10%
Disseminating KPI information	45%	43%	12%
Analyzing Big Data to improve visibility	44%	42%	14%
Providing automated, statistically driven forecasting	41%	48%	11%
Providing actionable alerts	35%	53%	12%
Enabling algorithmic planning	23%	53%	24%

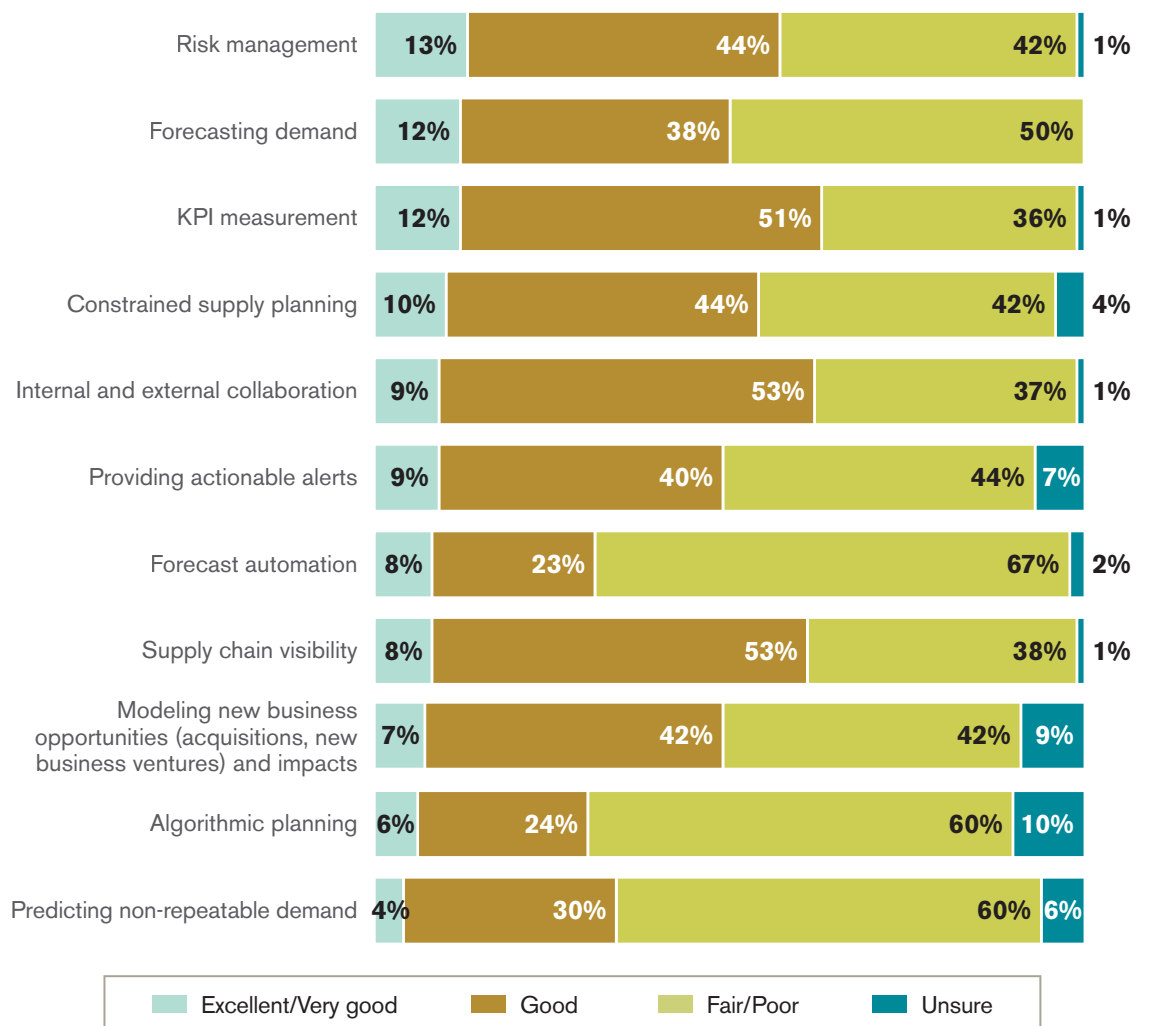# The Keys to Capturing and Leveraging Actionable Information

When asked to evaluate their current supply chain capabilities from a technical perspective, operations managers feel there's much room for improvement in many areas. Slightly more than one out of 10 considers risk management (13%) and their ability to forecast demand (12%) as well as monitoring and the ability to monitor KPIs (12%) as imperative capabilities.

More than one-half of the supply chain executives surveyed feel their current supply chain's capabilities on visibility (53%), collaboration (53%) and KPI measurements (51%) are adequate. Yet, while one-half assessed their KPI measurement capabilities as "good," only four out of 10 (40%) claimed their supply chain is adept at providing actionable alerts. This gap suggests the need to deliver reports and have the capacity to act upon results in real time.

Capabilities such as forecast automation, predicting non-repeatable demand and algorithmic planning appear highly undeveloped on a widespread level. (Figure 4)

FIGURE 4

Evaluating supply chain technology capabilities

Capability	Excellent/Very good	Good	Fair/Poor	Unsure
Risk management	13%	44%	42%	1%
Forecasting demand	12%	38%	50%	
KPI measurement	12%	51%	36%	1%
Constrained supply planning	10%	44%	42%	4%
Internal and external collaboration	9%	53%	37%	1%
Providing actionable alerts	9%	40%	44%	7%
Forecast automation	8%	23%	67%	2%
Supply chain visibility	8%	53%	38%	1%
Modeling new business opportunities (acquisitions, new business ventures) and impacts	7%	42%	42%	9%
Algorithmic planning	6%	24%	60%	10%
Predicting non-repeatable demand	4%	30%	60%	6%

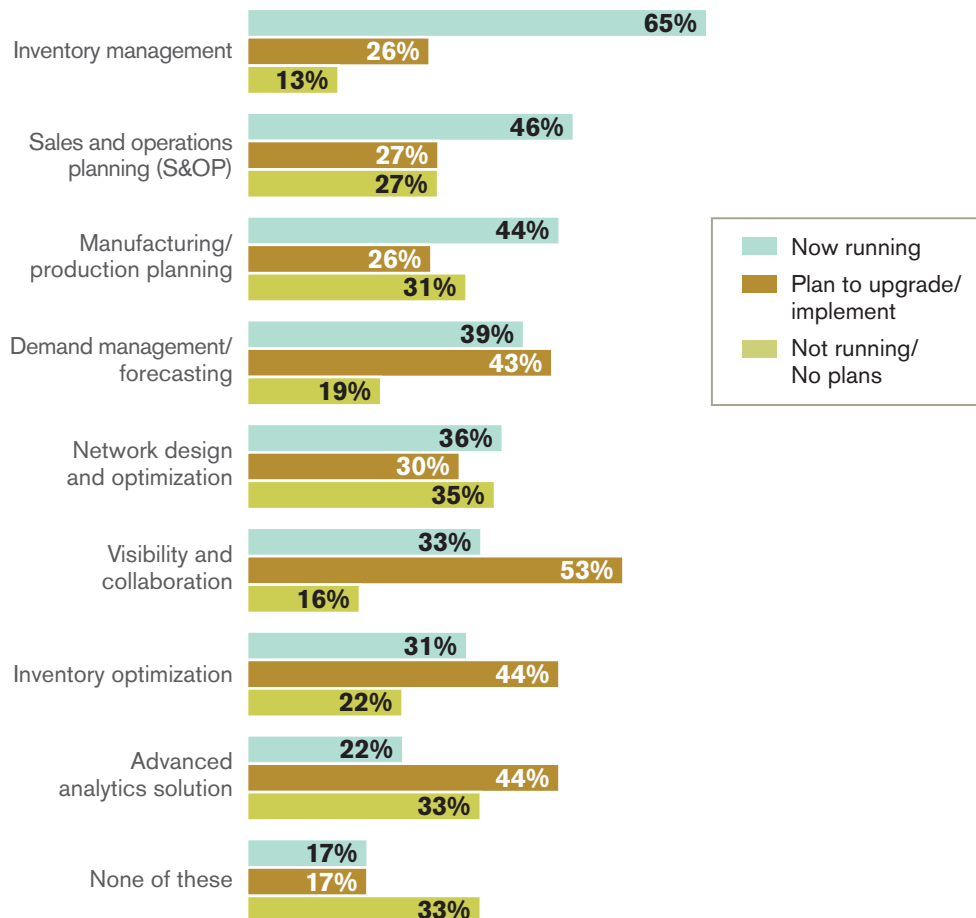Legend: Excellent/Very good | Good | Fair/Poor | Unsure

Inventory management (65%) is the most commonly used solution at these organizations. Sales and Operations Planning (S&OP) (46%) and production planning (44%) are also in use by nearly one-half of those surveyed.

Applications to improve visibility and collaboration, advanced analytics, and demand management are recognized as important objectives and are forecast for evaluation or implementation in the upcoming months. Adoption of these solutions, once again, conveys the need to quickly access correct data to deliver accurate insights or predictions aimed at specific supply chain planning processes. The survey shows 44% of respondents are currently implementing or plan to upgrade their advanced analytics capabilities further highlighting the importance companies place on the ability to quickly identify areas or opportunity and risk from the vast amount of data available to them.

Inventory optimization solutions are also widely considered as an effective tool to manage inventory to help control and reduce costs, as well as provide improved service levels. (Figure 5)

FIGURE 5

Supply chain solutions/applications now running and planning to upgrade or implement during the next 2 years

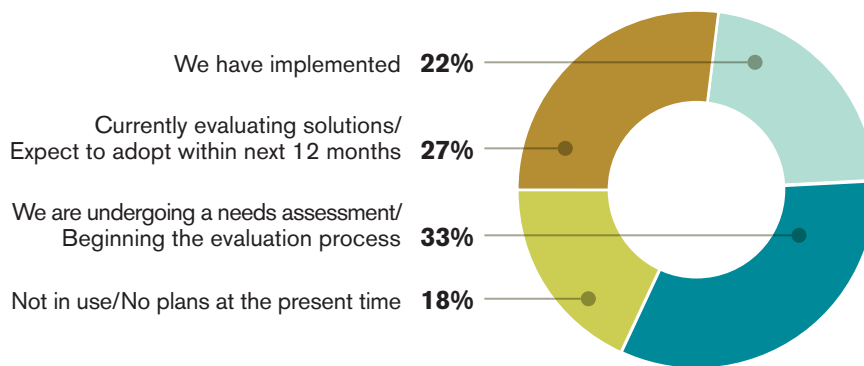|	Now running	Plan to upgrade/implement	Not running/No plans
Inventory management	65%	26%	13%
Sales and operations planning (S&OP)	46%	27%	27%
Manufacturing/production planning	44%	26%	31%
Demand management/forecasting	39%	43%	19%
Network design and optimization	36%	30%	35%
Visibility and collaboration	33%	53%	16%
Inventory optimization	31%	44%	22%
Advanced analytics solution	22%	44%	33%
None of these	17%	17%	33%

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The Value of Supply Chain Analytics

While nearly one out of four organizations (22%) are now running measurable supply chain analytics, six out of 10 (60%) are either in the early stages of the evaluation process or have plans to adopt analytical tools during the next 12 months. This level of activity demonstrates the critical importance for companies to better utilize the vast amounts of structured and unstructured information that's available. (Figure 6)

FIGURE 6

Adoption and usage of supply chain analytics

We have implemented **22%**

Currently evaluating solutions/
Expect to adopt within next 12 months **27%**

We are undergoing a needs assessment/
Beginning the evaluation process **33%**

Not in use/No plans at the present time **18%**

Among those who presently have no plans to adopt these types of supply chain tools say they either lack the resources, have other, more immediate priorities, or their supply chain teams need to prove the value to management, who now see the supply chain as a support structure rather than an operation that can bring business value to the company.

Supply chain analytics are recognized as a means to improve business-critical strategies such as customer service processes, supply chain planning and forecasting, and logistics and transportation management. Greater visibility into areas of the supply chain that require direct attention, identifying opportunities to automate routine processes, and the ability to harvest data from multiple sources can quickly drive significant improvements. These practices will enable dynamic supply chain functions to be quickly adopted. (Figure 7) The need for better understanding of customer needs and customer demand is closely intertwined with these top use areas for advanced analytics. While looking at costs like excess inventory is one application, the leading ones in the current growth economy are more closely tied to better serving customers, making sure the right inventory is available to them, and that orders get to them quickly and accurately.

FIGURE 7

Applications with which organizations are using/planning to use supply chain analytics

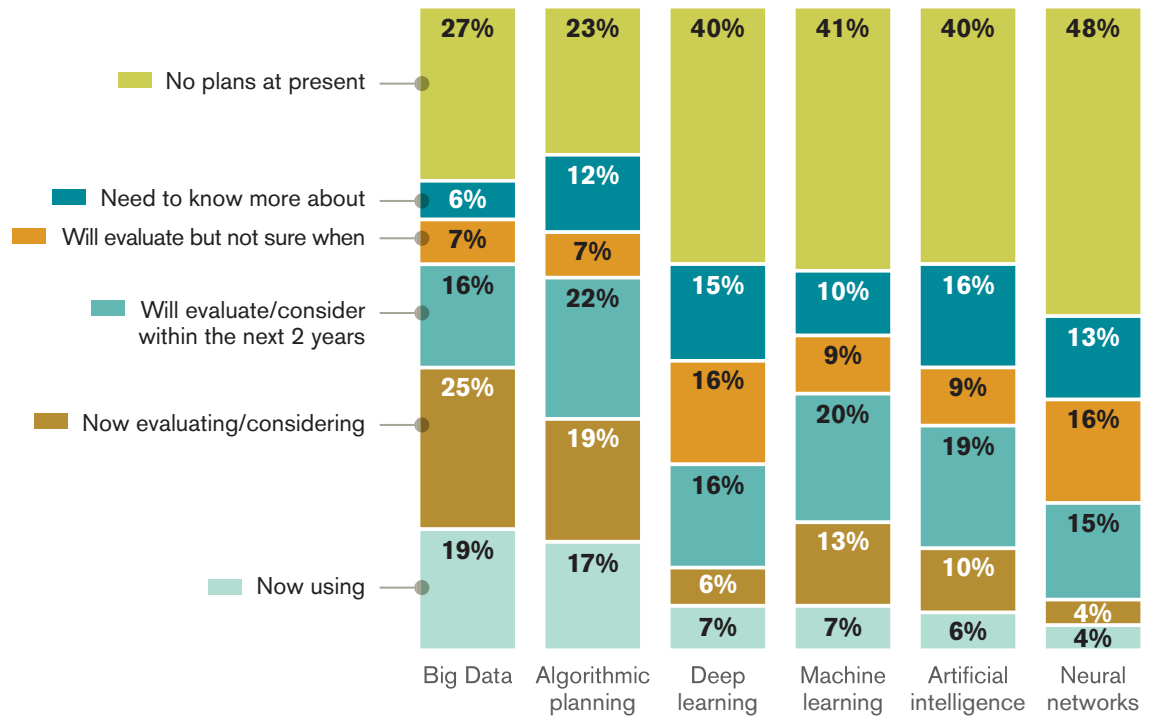| Application	Percentage
Supply chain planning and forecasting	63%
Logistics and transportation management	61%
Improve customer service	58%
Improve in stock/on-shelf product availability	46%
Improve distribution/order fulfillment	42%
Reduce excess inventory due to demand volatility	42%
Supplier relationship management	42%
Reduce slow-moving and obsolete items	39%
Risk management/track and predict supply chain disruptions	33%
Cost-to-serve	32%
Better sense and respond to seasonal demand	25%
Cut forecast bias and incentive conflict from the S&OP process	23%
Customer profitability	19%
New product introduction	18%
Analyze data from sensors, smartphones, etc.	14%

However, organizations remain cautious when adopting advanced technologies such as artificial intelligence (AI), machine learning, deep learning, and neural networks. At least four out of 10 companies surveyed point out these applications and programs are not even on their organization's radar.

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While more than four out of 10 (44%) are either now using or are evaluating Big Data, it's curious to see how organizations expect to capitalize on the advantages of Big Data without approaches such as AI, deep learning, machine learning, etc. to explore the mountains of information and turn data into actionable insights (Figure 8). It may be that line of business professionals do not fully realize the extent to which predictive and prescriptive capabilities are employed in Big Data analysis solutions, since they are mainly interested in actionable recommendations, rather than the algorithms that generated them.

FIGURE 8

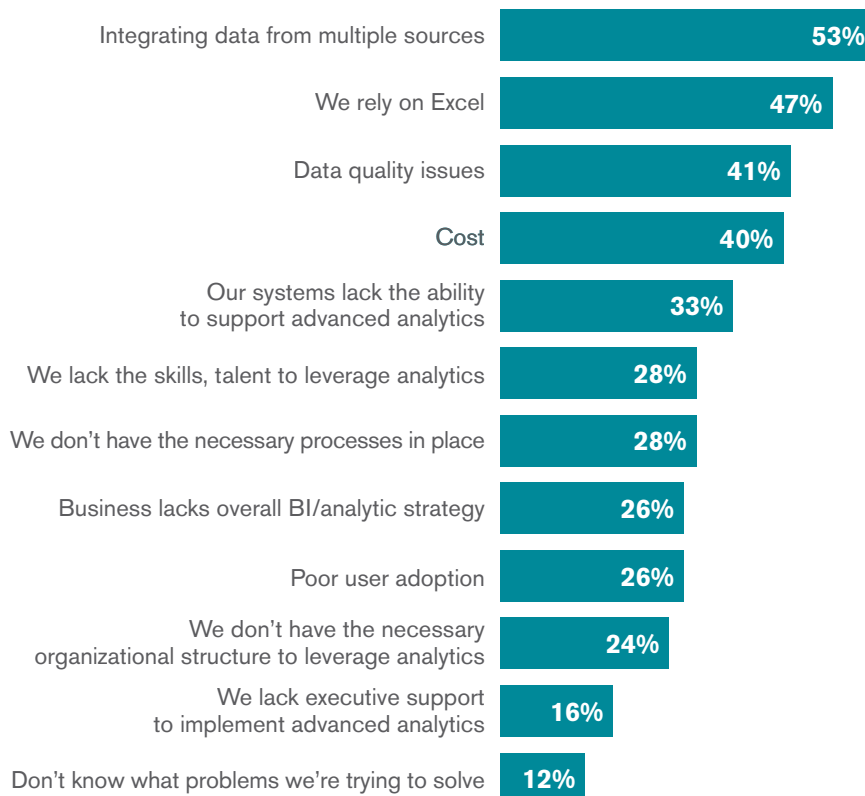## Usage and plans for current technologies and applications

Legend:
- No plans at present
- Need to know more about
- Will evaluate but not sure when
- Will evaluate/consider within the next 2 years
- Now evaluating/considering
- Now using

	Big Data	Algorithmic planning	Deep learning	Machine learning	Artificial intelligence	Neural networks
No plans at present	27%	23%	40%	41%	40%	48%
Need to know more about	6%	12%	15%	10%	16%	13%
Will evaluate but not sure when	7%	7%	16%	9%	9%	16%
Will evaluate/consider within the next 2 years	16%	22%	16%	20%	19%	15%
Now evaluating/considering	25%	19%	6%	13%	10%	4%
Now using	19%	17%	7%	7%	6%	4%

The benefits to running supply chain analytics appear evident, but the process doesn't come without its pain points and bottlenecks that demand attention during the adoption, implementation and execution stages. Seamless integration among systems continues to be a major issue as is the continued reliance on spreadsheets and concerns about data quality. There may be a change management dynamic at play here, since potential users of advanced analytics may not realize the extent to which these tools differ from spreadsheets in the scope of data they can consider or the predictions they can reach. Some advanced analytics solutions also have data cleansing and transformation features to ensure data quality, so perhaps some of these obstacles will diminish once advanced analytics capabilities are fully evaluated. (Figure 9)

FIGURE 9

Obstacles faced when
## adopting, implementing or running analytics

Obstacle	Percent
Integrating data from multiple sources	53%
We rely on Excel	47%
Data quality issues	41%
Cost	40%
Our systems lack the ability to support advanced analytics	33%
We lack the skills, talent to leverage analytics	28%
We don't have the necessary processes in place	28%
Business lacks overall BI/analytic strategy	26%
Poor user adoption	26%
We don't have the necessary organizational structure to leverage analytics	24%
We lack executive support to implement advanced analytics	16%
Don't know what problems we're trying to solve	12%

Sales and Operations Planning (S&OP)

Among those currently running an S&OP process (46% - see Figure 5), one out of 10 laud
their program as being highly successful. Conversely, nearly twice as many (19%) admit their
S&OP process is ineffective while another 71% claim it's only somewhat useful. Once again,
the ineffectiveness of an S&OP process may relate to the quality of data that is accessible and
relied upon. (Figure 10)

FIGURE 10

Effectiveness of operation's S&OP program

Highly effective **10%**

Somewhat effective **71%**

Not very/Not at all effective **19%**
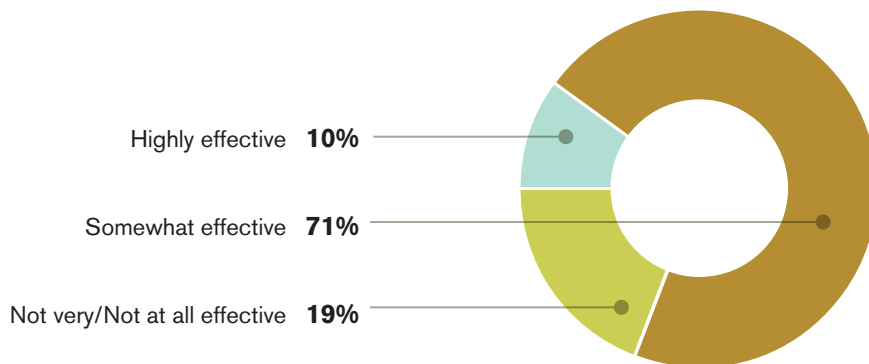
One contributing factor to ineffective S&OP performance can be linked to how data are being probed. Only a relatively small percentage of respondents use business analytics or intelligence tools while most still rely on static data. This hampers data analysts' ability to manipulate data and run "what-if scenarios." Being able to manage and analyze data on the fly would empower operations to make timely, accurate, and well-informed business decisions. (Figure 11)

FIGURE 11

Methods for presenting S&OP plans and options

PowerPoint	Excel	Business intelligence tools	Software solution
67%	60%	27%	10%
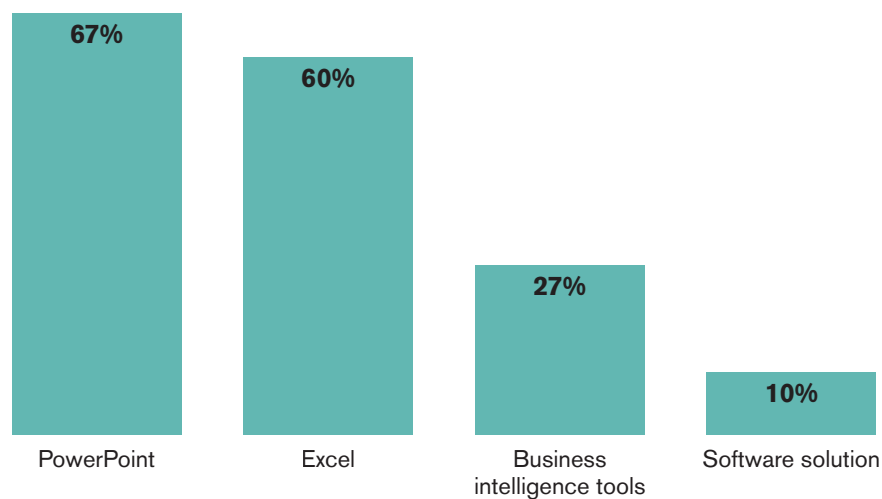
Reasons for lackluster S&OP performance seem apparent. By seamlessly integrating systems that would enable treatment of clean, single sourced data, management support, better tools to allow for greater visibility, and adhering to what the data suggests would assuredly improve any S&OP initiative.

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Conclusion

Overall, there appears to be strong interest in solutions that help companies grasp demand trends and improve customer service, while also addressing the need to reduce operational costs. There are capability gaps and hurdles that exist, but there's strong interest in closing some of these gaps via actions like evaluating, selecting, and deploying advanced analytics. There also is interest in Big Data analysis, and in all likelihood, an under-appreciation of the extent to which AI and predictive and prescriptive capabilities are enablers of effective Big Data and advanced analytics. Common reliance on spreadsheets and static S&OP data presentations, however, suggests most companies are still in the early stages of adopting advanced analytics.

For line of business professionals, there is high interest in capabilities that help them serve customers, forecast and understand demand, have the right inventory on hand, and provide quick and cost-effective logistics. The appreciation of capabilities like AI and machine learning algorithms as enablers of these ends appears on the whole to be a work in progress, but respondents do see the need for actionable information and improved analytics that help them run a customer-centric, proactive supply chain.

Methodology

This research was conducted by Peerless Research Group (PRG) on behalf of *Supply Chain Management Review* for Logility, Inc., a leading provider of supply chain analytical solutions. This study was executed in April, 2018 and administered over the Internet to subscribers to *Supply Chain Management Review*.

In total, 95 interviews were completed among high-ranking supply chain and operations executives in manufacturing, retail, wholesale and transportation organizations. All respondents were prequalified for being involved in decisions regarding their organization's current and future usage of supply chain management and analytic solutions such as demand planning, inventory management, replenishment and supply chain planning, capacity and manufacturing planning, etc.

About Logility

With more than 1,350 customers worldwide, Logility is a leading provider of collaborative supply chain optimization and advanced retail planning solutions that help medium, large and Fortune 500 companies realize substantial bottom-line results in record time. Logility Voyager Solutions™ is a complete supply chain and retail optimization solution that features advanced analytics and provides supply chain visibility; demand, inventory and replenishment planning; Sales and Operations Planning (S&OP); Integrated Business Planning (IBP); supply and inventory optimization; manufacturing planning and scheduling; and retail merchandise planning, assortment and allocation. Logility customers include Big Lots, Fender Musical Instruments, Husqvarna Group, Parker Hannifin, Verizon Wireless, and VF Corporation. Logility is a wholly owned subsidiary of American Software, Inc. (NASDAQ: AMSWA), named one of the 100 Most Trustworthy Companies in America by Forbes.

Contact Information

To learn more about Logility's supply chain management and analytic solutions, visit: www.logility.com or email at info@logility.com.