

Demand Management: Matching Supply and Demand over Time

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Leading companies such as Dell, Toyota, P&G and Wal-Mart do not confine supply chain management to the back room — in these organizations SCM also supports front-office functions such as sales & marketing. Market leaders recognize that SCM is integral to securing long-term business growth and profitability.

A recent study carried out as part of the MIT Supply Chain 2020 Project affirms the importance of SCM in helping companies to gain competitive advantage. The study found that focusing supply chains on achieving customer objectives rather than reducing near-term costs and inventories can have a greater impact on a company's financial performance. In other words “commercializing” a supply chain by orienting it towards demand-side objectives is critical to making a positive impact on competitiveness and financial performance.

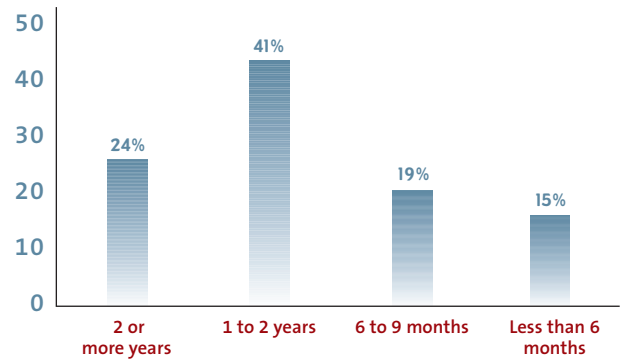
The optimization of demand management (DM) processes is crucial to harnessing the strategic power of supply chains in this way. Leading enterprises integrate elements of SCM with customer-facing and revenue-generating capabilities within their DM processes, to optimally shape and create customer demand.

Moving from Push to Pull Is Not Enough

Over the last couple of decades companies have been evolving from a “push” manufacturing paradigm to a consumer “pull” one. The shift eliminates waste and enables companies to capture all sales opportunities, but it does not necessarily lead to the most effective DM approach.

For example, most manufacturing companies have implemented Sales and Operations Planning (S&OP)

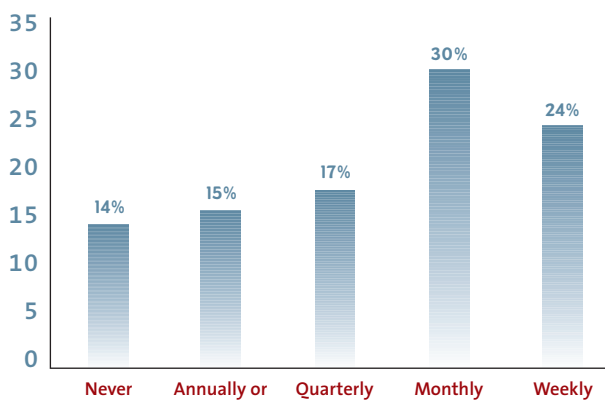
How far out does your company routinely plan for?



processes to help them better match supply plans with demand plans. However, the strict “pull” philosophy embodied in these S&OP processes revolves around supply matching demand in a “reactive” way — not supply matching demand in a “proactive” and enhancing way. True optimization needs to incorporate proactively managing demand, not just reactive management. The basic paradigm shift required assumes that demand is variable and controllable (to some extent) rather than fixed. It involves optimally generating and shaping demand in conjunction with supply capabilities.

Rather than a strict “pull” concept, P&G espouses what it terms the Consumer-Driven Supply Network (CDSN) and AMR Research the Demand-Driven Supply Network (DDSN). Under both these concepts, supply does not just meet demand reactively. Instead, marketing and sales personnel influence demand through revenue-generating and demand-shaping programs such as new product introductions and promotional campaigns. These, in turn, are designed to optimize both demand-generating activities and supply capabilities together.

How often does your company routinely update supply-demand plans?

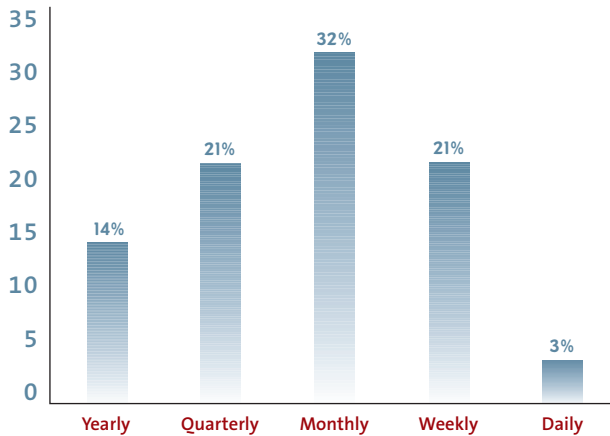


DM Involves Multiple Supply-Demand Processes

Effective DM also involves multiple disciplines working together to achieve the best balance between supply and demand. DM is defined as the “management of matching demand and supply over time,” and involves processes that deal with the short term, medium term and long term.

It requires coordinated decision making among supply-side managers from supply chain, procurement, manufacturing, logistics, merchandize planning, store operations and customer service, as well as with demand-side managers from the marketing, sales and merchandizing organizations. In order to truly optimize profitability, decisions need to be made jointly across these diverse management functions.

What “time buckets” are your plans comprised of?



1. Setting customer service expectations in the long term
2. Routine Supply-Demand planning in the medium term
3. Matching supply and demand in the short term (including real time)
4. Demand management decision support information

Research Findings

A. Customer Service Expectations: Largely Driven by Sales Concerns

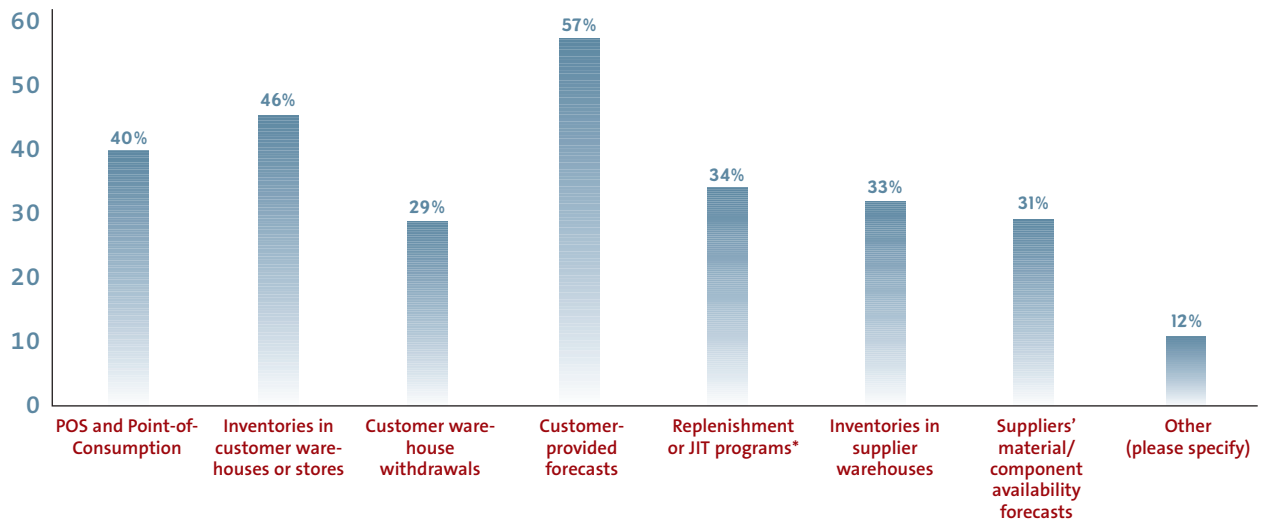
The setting of customer service expectations offers companies an important opportunity to align supply and demand. However, the study indicates that companies are not taking full advantage of this opportunity.

The DM Research Survey

A research survey to assess how DM processes and management approaches are being deployed was carried out by MIT’s *Supply Chain Strategy* newsletter, the monthly publication coproduced by the MIT Center for Transportation & Logistics and Larstan Business Reports. This online survey conducted June through July 2006 asked supply chain managers and corporate management executives at leading North American companies about four key aspects of DM:

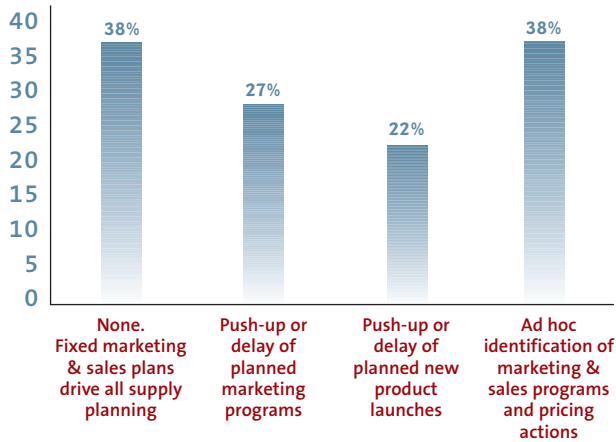
Sales and marketing organizations typically work with customers to set the various Terms and Conditions (T&Cs) for servicing sales contracts. While pricing is certainly a big part of these agreements, some elements directly impact the demand placed upon supply chain organizations. Examples include delivery cycle times, special delivery requirements, co-managed inventory programs, and the sharing of downstream information such as POS data, and, in the future, RFID-related data. In addition, Marketing and Sales might segment the customer base in order to provide differentiated levels of service. T&Cs represent a long-term aspect of demand-supply matching, since these requirements influence the level of both demand and customer service costs.

What types of external data are used as inputs to the supply-demand planning processes on an ongoing basis?



*Inventory replenishment plans for customers on comanaged inventory programs (e.g., VMI and CPFR) or production needs for Just-in-Time (JIT) manufacturing customers.

What type of demand shaping is done during the planning process



A.1 Revenue Maximization Drives Customer Segmentation

The research supports a working hypothesis that most customer service segmentation schemes are largely driven by customers’ sales potential, rather than profitable service criteria. As a result, maximizing revenues, rather than profits, is currently the most important objective in most companies’ segmentation processes.

Most of the companies polled (76 percent) segment their customer bases for the purposes of providing specialized and customized services. However, revenue-oriented segmentation schemes are most prevalent, representing 3 of the 4 top mentioned criteria — with 43percent of companies using customer importance, 38 percent using sales dollars, and 27 percent using customer profitability to segment customers. Supply-side related schemes were less prevalent with, for example, only 21 percent mentioning segmenting based on delivery time requirements.

A.2 Delivery Time, Packaging and Handling Are Used Most to Differentiate

The two most mentioned differentiated service offerings involve delivery cycle times (47 percent) and special handling and packaging requirements (40 percent). The use of collaborative programs as service differentiators, such as comanaged inventory (37 percent) and information-sharing programs (29 percent), was less prevalent although higher than anticipated.

B. Routine Supply-Demand Planning: Companies Leverage External Data and Shape Demand More Than Expected

The S&OP process represents a routine medium-term supply-demand planning process that is followed by many

manufacturing-based companies. It involves the balancing of current and future supply and demand in a cross-functional process based on consensus-based supply-and-demand-side planning. In retailing, a parallel process is the Merchandize Planning and Allocation process.

B.1 Monthly and Weekly Planning the Most Prevalent

These planning processes offer opportunities to jointly optimize future supply and demand together. The research shows that:

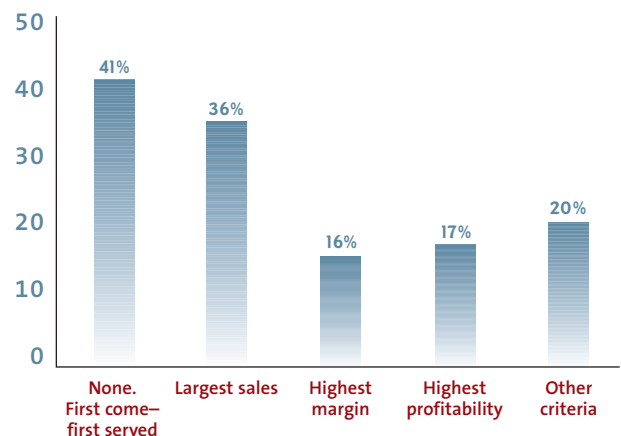
- » *The majority of companies plan monthly or weekly.* Seventy-one percent of companies plan more often than once a year. Still, it is surprising that as much as 14 percent of companies don’t routinely plan at all.
- » *Planning horizons from 1 to 2 years are most often used.* Forty-one percent of companies routinely plan one to two years out. Only 24 percent of companies extend their horizons beyond two years
- » *The majority use monthly or weekly time buckets.* Thirty-two percent of companies plan month-by-month and 21 percent week-by-week.

B.2 External Data Is Being Leveraged More Than Expected

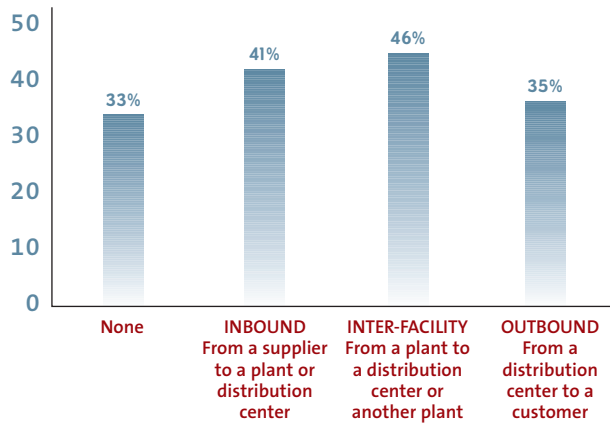
There is more use of external downstream data in routine planning processes than was assumed prior to the research being conducted. Fifty seven percent of companies, for example, use customer-provided forecasts and 46 percent use data on inventories in their customers’ warehouses or stores. In addition, 40 percent use Point-Of-Sale (POS) and point-of-consumption data.

There is significant, but less, use of external upstream data used for routine planning, with 33 percent of companies leveraging information about inventories in suppliers’ warehouses, and 31 percent using

What types of customers are given the highest priorities when your company fulfills orders?



What real-time supply chain visibility is available at your company for tracking in-transit goods?



material/component availability forecasts provided by suppliers.

B.3 Demand Shaping Is Used More Than Previously Thought
“Demand shaping,” a term popularized by Dell, is a process that leverages joint supply-demand matching. Companies take actions to create and shape demand to rectify current and future short or surplus supply.

Thirty-eight percent of the companies surveyed don’t shape demand during their routine planning processes because predetermined and fixed marketing & sales programs drive all supply planning. Still, this means that over 60 percent of companies do some type of demand shaping during planning. Thirty-eight percent of the respondents identify actions to shape demand on an ad hoc basis, 27 percent push up or delay planned marketing programs to avoid short or surplus inventories, and, somewhat fewer, 22 percent, delay or bring forward planned new product launches.

C. Short-term Supply-Demand Matching: Various Priorities Used

C.1 Order Promising Widely Practiced

One of the functions customer service departments are responsible for is matching demand and supply in real time. As orders are quoted and taken, company reps routinely inform customers by which date their orders might be filled. An accurate promise date is needed to set a customer’s expectation to a promise that can be kept.

Estimating a promise date represents another opportunity to optimally match supply and demand. An Available-To-

Promise (ATP) function allows a customer service rep to assess what current inventories and/or products scheduled for production might be available to fill a customer’s order. If none are, then a Capable-To-Promise (CTP) function assesses when internal and/or suppliers’ production capacities, components, and materials might be made available to manufacture the products placed on the order.

Eighty-nine percent of the companies surveyed give a promise date to customers at the time of order receipt or entry using a combination of capabilities. Forty-nine percent leverage a standard list of predetermined leads times by product. ATP capabilities are used by 42 percent that check inventory information and 24 percent that check production schedules. Only 14 percent leverage CTP capabilities to promise orders.

C.2 Most Respondents Prioritize Customers Around Sales Concerns

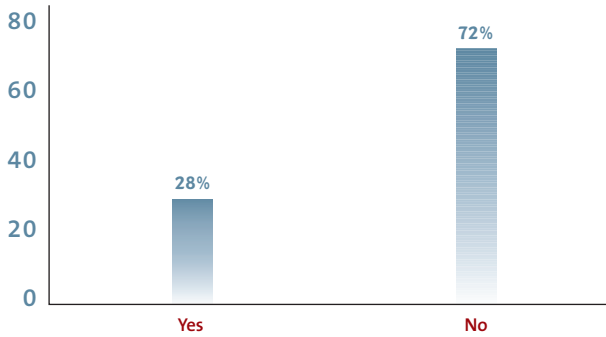
Order promising functions involve matching order demand with current and future supply plans, often in the context of expected future demand to give some customers a priority over others. The research shows that 59 percent of companies give some customers higher order fulfillment priority than others; the remaining 41 percent treat all customer orders on a first come–first served basis.

Similar to customer segmentation, customer prioritization schemes are by and large driven by sales concerns. Thirty-six percent of respondent companies serve customers generating the largest sales first, and 16 percent serve highest margin customers first. Only 17 percent of the companies serve customers with the highest profitability first.

C.3 A Majority Track In-transit Goods, But Not Many Redirect In-transit Goods

Real-time visibility can enable a Supply Chain Event Management (SCEM) process, whereby supply can be re-directed on an exception management basis. One DM-related SCEM process is the capability to use real-time visibility of in-transit goods to redirect shipments towards pockets of upside demand. The research shows that only 28 percent of companies do this. A lack of real-time visibility into these product flows may be one reason for this relatively low usage level. One-third of companies don’t have any real-time visibility, and those that do don’t have it across their entire supply chains, including the visibility of all inbound, inter-facility, and outbound in-transit goods.

Does your company use real-time supply chain visibility to redirect in-transit goods to move them towards pockets of upside demand?

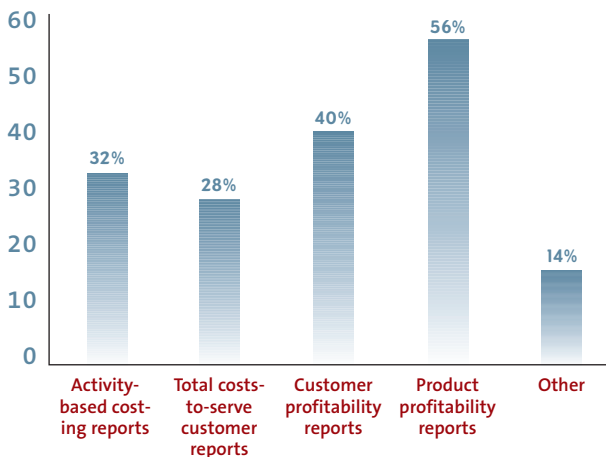


D. DM Decision Support Information: Product-based More Common Than Customer-based Information

Demand management requires information on a variety of demand and supply-side costs, cycle times and other relevant factors. These details need to be readily available to decision makers in order for them to truly balance supply and demand in an optimal way over time. For example, optimized customer service segmentation needs to consider the costs and benefits of the various ways to segment, as does the development of differentiated services. Similarly, order promising and customer prioritization should consider customer profitability and costs.

Of the various types of information that are needed to support DM decisions, product profitability reports are the most common, with 56 percent of the companies

Which of the following types of information are readily available to help make DM decisions at your company?



questioned having them available. Forty percent of respondent enterprises have access to customer profitability reports. However, only 28 percent have total costs-to-serve customer reports.

Summary

Numerous processes deal with DM, as defined by the matching of supply and demand over time. These include short-term, operationally-based processes such as order promising and in-transit goods redirection, as well as longer term ones such S&OP and customer segmentation.

The research suggests that DM processes are being deployed more widely than expected. Key findings include:

- » Customer segmentation schemes favor the use of sales rather than profitability-oriented criteria.
- » The use of external data during medium-term planning is more prevalent than was anticipated prior to the research.
- » Demand shaping is being leveraged more than expected during medium-term planning.
- » Order promising is practiced widely, with customer priorities largely driven by the use of sales rather than profitability-focused criteria.

Although this research only scratches the surface of the demand management area, it does show that various DM processes are being deployed by many companies. The work also points to the tremendous opportunities that exist to improve these important processes, for example by reducing the emphasis on sales issues and increasing the focus on long-term profitability concerns. Also, while external data and supply chain visibility are being leveraged in some way, there may be better strategies, principles and methods for deploying these devices. The research does not address this question.

The MIT Center for Transportation and Logistics (MIT-CTL) has launched a DM Solutions Research Group. This ground-breaking research project will include technology-based solution companies, consultants and users that collaborate and share new ideas and information. The group will focus on and help steer research into the products and services companies need to enable advanced demand management strategies, principles and methods. For more information contact Larry Lapide at LLapide@MIT.EDU

Demand Management: Matching Supply and Demand Over Time Questionnaire

Information about you and your company

1. What is your SCM function?

- Procurement/Sourcing
- Manufacturing
- Logistics (e.g., warehouse, inventory management and transportation)
- Supply Chain
- Merchandize Planning
- Store Operations
- Customer Service
- Other, please specify:

2. What industry is your company in:

- Manufacturing
- Distribution and Wholesale
- Retail
- Third Party Logistics
- Other, please specify:

Setting customer service expectations in the long term

3. What criteria does your company use to segment its customer base for the purposes of providing specialized and customized services? (check all that apply)

- None, my company does not segment customers for service purposes (skip to Question 5)
- Sales dollars
- Number of sales transactions
- Sales channels (e.g., direct, mass market retail, specialty retail, indirect, Internet)
- Importance such as strategic, long-term contract versus casual customers
- Profitability
- Delivery time requirements
- Other, please specify

4. What differentiated service offerings does your company provide to customer segments (check all that apply)

- None, every customer gets the same level of service and is treated the same
- Delivery cycle times (e.g., order-to-ship, order-to-delivery requirements)
- Special handling and packaging requirements
- Sharing of downstream information by

customers (e.g. POS data, retailer warehouse inventories, RFID data, and sales data)

- Sharing of replenishment plans and sales forecasts by customers
- Comanagement inventory programs with customers [e.g, Vendor Managed Inventory (VMI), Collaborative Planning Forecasting and Replenishment (CPFR)]
- Other, please specify

Routine supply-demand planning in the medium term

5. How often does your company routinely update supply-demand plans?

- Never, my company does not have routine planning processes (skip to Question 8)
- Annually or longer
- Quarterly
- Monthly
- Weekly

6. How far out does your company routinely plan for?

- Up to 2 or more years
- Up to 1 to 2 years
- Up to 6 to 9 months
- Up to 6 months

7. What "time buckets" are plans comprised of?

- Year-by-year
- Quarter-by-quarter
- Month-by-month
- Week-by-week
- Daily

8. What types of external data are used as inputs to the supply-demand planning processes on an ongoing basis? (check all that apply)

- POS and point-of-consumption data
- Inventories in customer warehouses or stores
- Customer warehouse withdrawals
- Customer-provided forecasts
- Inventory replenishment plans for customers on comanaged inventory programs (e.g., VMI and CPFR) or production needs for Just-in-Time (JIT) manufacturing customers
- Inventories in supplier warehouses
- Material/component availability forecasts provided by suppliers

9. In matching supply and demand plans does your company use any advanced quantitative techniques? (check all that apply)

- None, my company does not use these
- Optimization techniques (e.g., linear programming)
- Manage supply-demand uncertainties using risk management techniques (e.g., risk pooling and hedging methods for scarce materials/components)
- Other, please specify

10. What type of demand shaping is done during the planning process (check all that apply)

- None, predetermined and fixed marketing & sales plans drive all supply planning
- Push-up or delay of planned marketing programs to avoid short or surplus inventories
- Push-up or delay of planned new product launches to avoid short or surplus inventories
- Ad hoc identification of marketing & sales programs and pricing actions targeted to get rid of surplus inventories or prevent shortages

Matching supply and demand in short term (including in real time)

11. What types of customers are given the highest priorities when your company fulfills orders? (check all that apply)

- None, all customer orders are filled on a first come-first served basis
- Customers generating the largest sales are served first
- The highest margin customers are served first
- Customers generating the highest profitability are served first
- Customer order priority is based on other criteria, please specify

12. When a customer order is received and entered, how is a delivery or promise date developed within your company? (check all that apply)

- None, customers are not given a promise date at the time of order receipt or entry
- A promise date is quoted to the customer using a standard list of predetermined lead times by product
- On-hand and on-order inventory is checked and first available inventory is allocated to the order [i.e., Available-to-Promise (ATP)]
- Production schedules are checked to see if the order can be supplied from what is coming off the line (also ATP).
- Unused production capacity and the availability of materials and parts are checked to see when the order can first be scheduled for production [i.e., Capable-to-Promise (CTP)]

13. What real-time supply chain visibility is available at your company for tracking in-transit goods? (check all that apply)

- None, my company has no visibility of in-transit goods.
- From a supplier to a plant or distribution center (i.e., inbound)
- From a plant to a distribution center or another plant (i.e., inter-facility)
- From a distribution center to a customer (i.e., outbound)

14. Does your company use real-time supply chain visibility to redirect in-transit goods to move them towards pockets of upside demand?

- Yes
- No

Demand management decision support information

15. Demand management requires information on a variety of demand and supply side costs, cycle times and other relevant factors. Which of the following types of information are readily available to help make DM decisions at your company? (check all that apply)

- Activity-based costing reports
- Total costs-to-serve customer reports
- Customer profitability reports
- Product profitability reports
- Other, please specify

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