Aberdeen*Group*

Global Supply Chain Benchmark Report

*Industry Priorities for Visibility, B2B Collaboration,
Trade Compliance, and Risk Management*

June 2006

— Sponsored by —

Executive Summary

Most companies are woefully inadequate in their automation and staff support for global trade. To keep up with global trade growth and increased competitive pressures, corporations are finding they must make significant changes in how they run their global supply chain operations. According to Aberdeen best practice research, among the most critical areas that companies are revamping are:

- **Supply chain visibility** to increase the transparency and velocity of global activities

- **Business-to-business collaboration** to improve supply/demand synchronization

- **Trade compliance** to ensure undisrupted movement across borders and take advantage of preferential trade agreements to lower total landed costs

- **Risk management** to ensure resiliency in face of supply chain disruptions

This report looks at these key improvement areas and how large, mid-market, and small companies are building game plans for success. Trends in strategies for increasing logistics agility are also addressed. The findings are based on benchmarks in May and June 2006 of more than 150 companies. Fully 45% of respondents were vice president or C-level executives, with most others at a director of supply chain or manager level.

A Critical Lack of Global Supply Chain Automation

A lack of automation and visibility is handcuffing companies with longer lead times, bigger inventory buffers, budget overruns, and continued demand-supply imbalances. Three-quarters of respondents report they don't have enterprise-wide automation for global supply chain processes (Figure i). ***On average, large companies report that their global supply chains are only 50% as automated as their domestic supply chains.***

Figure i: Technology Maturity Remains Dismal for the Global Supply Chain
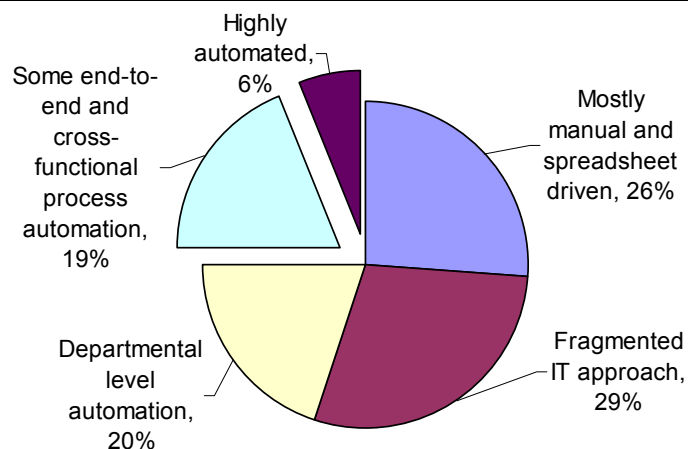
Source: Aberdeen*Group*, June 2006

Some 79% of large companies say that the lack of supply chain process visibility is their top concern. An astounding 90% of all enterprises report that their global supply chain technology is inadequate to provide the corporate finance organization with the timely information it requires for budget and cash flow planning and management.

To address these inadequacies, companies are moving away from building in-house applications and toward using commercial applications from a varied set of vendors, ranging from software specialists to managed service vendors and logistics service providers. In fact, custom-built applications rank first in current usage for global supply chain technology but drop to last place in popularity for *new* IT implementations. By comparison, on-demand applications (also called "software as a service") are used today by the least number of respondents but rank second in popularity for future adoption.

Human Resources Shortages

Fully 87% of large enterprises and 64% of all respondents say their company's staffing for managing global supply chain and trade compliance processes is inadequate. This is triggering increased attention on how to leverage business process outsourcing, managed services, and logistics service provider expertise.

The Supply Chain Risk Management Gap

While 82% of companies are concerned about supply chain resiliency, just 11% are actively managing this risk. This action gap is one of the greatest weaknesses of current corporate global supply chain strategies; it threatens the continuity of a company's business and sets the stage for gross margin erosion due to under-managed supply chain uncertainty and risk. An emerging set of technologies and solution providers are helping companies better assess risk and create contingency plans.

Recommendations for Action

- **Extend supply chain visibility:** Move to exception-based management of global supply chain activities and slowly increase the number of milestones you monitor. Start executing against a longer-term roadmap that adds escalation policies, inventory pipeline visibility, mobile asset management, root cause analysis, and financial settlement and financing integration.

- **Scale business-to-business collaboration:** The most productive collaboration processes are collaborative forecasting, inventory management, and replenishment, so focus on scaling those first.

- **Go corporate-wide with trade compliance:** Move toward a single corporate-wide trade compliance platform and comprehensive origin and trade agreement management. Smaller companies should look to on-line tools for restricted party screenings and total landed cost calculations.

- **Institutionalize risk management**: Make risk assessment and contingency planning part of your standard operating procedure. Institute supplier remediation programs for high-risk providers, and increase logistics and supply agility to improve recovery capabilities.

Table of Contents

Figures

Tables

Figures

Chapter One:
Global Supply Chain Anxieties

Key Takeaways

- 79% of large enterprises say their top concern is the lack of critical supply chain process visibility.

- Three-quarters of firms lack enterprise-wide automation for global supply chain processes.

- Inadequate technology is preventing supply chain organizations from satisfying the finance department's information needs.

Today, the fastest changing area of supply chain management is the global supply chain. Large and small companies alike have expanded opportunities to sell internationally and source from low-cost countries – and are leaping to take advantage of the associated revenue growth and lower total landed costs that can be achieved.

To support these corporate strategies, supply chain professionals are finding they must make significant changes in how they run their global supply chain operations. The makeover is occurring at a technology level (via a new wave of global supply chain automation), at a process level (with cross-functional processes and business partner collaboration), and at a staffing level (with increased attention on how to leverage business process outsourcing, managed services, and logistics service provider expertise).

According to Aberdeen best practice research conducted in 2005, among the most critical areas that companies are revamping are:

- **Supply chain visibility** to increase the transparency of global activities

- **Business-to-business (B2B) collaboration** to improve supply/demand synchronization

- **Trade compliance** to ensure undisrupted movement across borders and take advantage of preferential trade agreements to lower total landed costs

- **Risk management** to ensure resiliency in face of supply chain disruptions

This report looks at these key improvement areas and how large, mid-market, and small companies are building game plans for success. Trends in strategies for increasing logistics agility are also addressed. Findings are based on benchmarks in May and June 2006 of more than 150 companies. Fully 45% of respondents were vice president or C-level executives, with most others at a director of supply chain or manager level. (See Appendix A for respondent demographics and research methodology.)

Top Areas of Concern for Global Supply Chain

Although regulatory pressures and the immaturity of logistics networks in low-cost countries receive extended press attention, these factors are not what keep supply chain executives up at night (Figure 1). Much more concerning to them is the continued lack of criti-

cal supply chain process visibility due to manual-driven processes. The lack of visibility is especially crippling to large enterprises ($1 billion or more in revenue), 79% of which cite this as a major concern.

The second highest concern is the uncoordinated nature of multi-tier supply chain processes, which causes an imbalance of supply and demand across tiers. Again, large enterprises, which often have more tiers to coordinate than their smaller counterparts, feel this pressure more intensely, with 56% stating this as a top concern. "It's challenging to get multi-tier upstream supply commitments in response to demand changes within an acceptable time duration, say within one day," says a large high tech respondent. "Today, the process is very manual in imploding materials availability to construct an optimum build plan."

These large companies are at a scale at which poor visibility and uncoordinated multi-tier processes result in significant "just in case" inventory carrying costs, premium freight expenses, and extended cycle times. Says a respondent at a large North American industrial equipment manufacturer, "To help improve the bottom line, we need more accurate forecasting and overall supply chain visibility."

Figure 1: Top Areas of Concern for Global Supply Chain
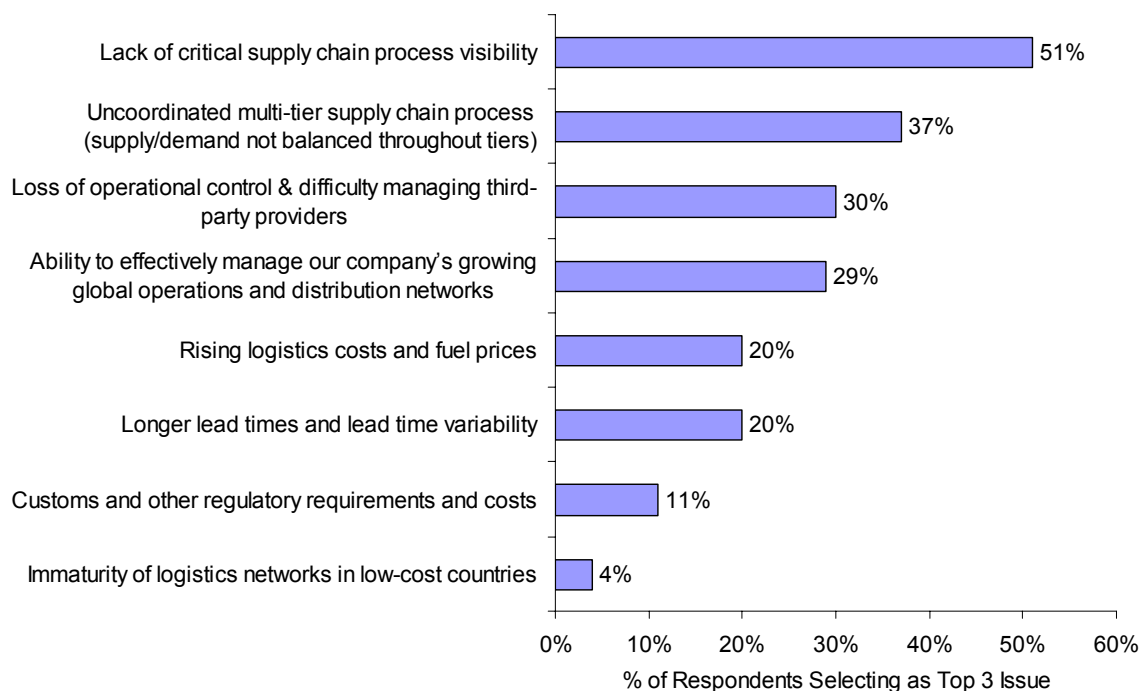
Source: Aberdeen*Group*, June 2006

Midsize participants report significant challenges with their ability to effectively manage their companies' growing global operations and distribution networks. Visibility and coordination challenges also rank high. Our key pressure, explains the CIO of a mid-market European retailer, "is coordinating the diversity of forwarders and suppliers delivering a wide collection of merchandise."

Beyond Bubble Gum and Baling Wire

Aberdeen best practice research of more than 400 companies in 2005 showed that cross-functional processes and automation were keys to global trade management success. Companies with this level of maturity had a 2x performance advantage in reducing documentation issues, shipment delays, and total landed cost. The average $1 billion company has an opportunity to free $10 million to $40 million in cash through basic automation and process improvements. (See *New Strategies for Global Trade Management*, March 2005, and *The CFO's Agenda for Global Trade*, September 2005).

Our 2006 research shows that most companies are still woefully inadequate in their automation and staff support for global trade. These areas must be redressed for companies to garner the full benefits of global selling and sourcing. The continued reliance on manual effort by internal logistics staff and business partners to get the job done is resulting in too much expediting, use of higher-cost secondary carriers, administrative costs and data errors, and inventory hedging.

Three-quarters of firms lack enterprise-wide automation for global supply chain processes (Figure 2). Fully 41% of large companies report a fragmented IT approach. This is in stark contrast to the level of automation that large enterprises have implemented for their domestic supply chains. ***On average, large companies report that their international supply chains are only 50% as automated as their domestic supply chains.***

Figure 2: Technology Maturity Remains Dismal for the Global Supply Chain
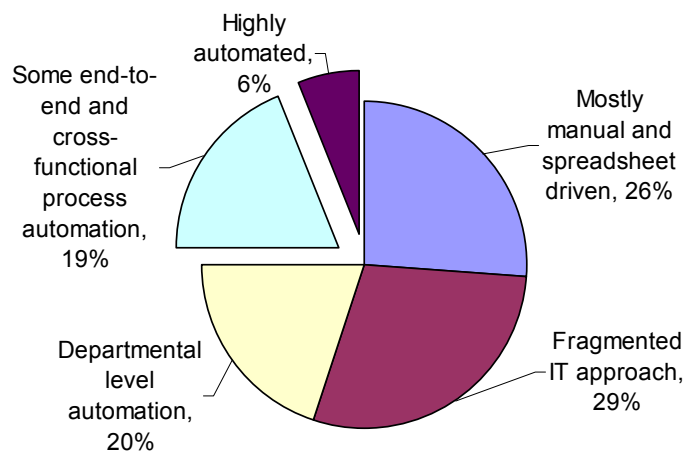
Source: Aberdeen*Group*, June 2006

Supply Chain Information Gap: The Impact on Finance Organizations

The lack of automation impacts not just the supply chain organization but also creates uncertainty in the finance organization. As shown in Figure 3, an astounding 90% of enterprises report their global supply chain technology is inadequate to provide the corporate finance organization with the timely information it requires. This information includes accurate costing and delivery dates for budget and cash flow planning and management.

Just as supply chain managers hedge against uncertainty by holding more inventory, so do finance managers hedge against uncertainty by holding more cash. Thus the financial productivity of enterprises is being undercut by the lack of global supply chain visibility and automation, which are vital weapons against uncertainty. The impact: (1) increased inventory holding costs, which result in increased working capital requirements; and (2) reduced cash flow certainty, preventing treasurers from making proactive use of accounts payable and accounts receivable balances and resulting in more cash being held.

Figure 3: Supply Chain Organizations Are Unable to Support the Finance Department's Information Needs
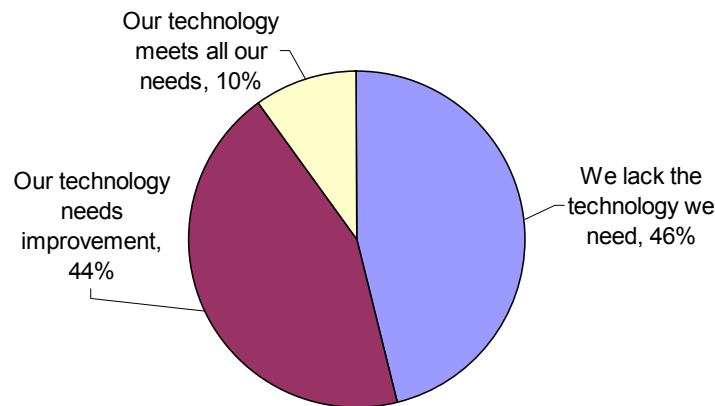
Source: Aberdeen*Group*, June 2006

Progressive supply chain executives are constructing automation initiatives that improve visibility and reduce uncertainty for both the supply chain and the finance organization. (For more information, see *Turning Your CFO Into a Supply Chain Cheerleader*, June 2006.)

Chapter Two:
Global Supply Chain Improvement Plans

Key Takeaways

- Supply chain visibility, collaboration, and costing lead the IT investment plans for companies. Trade compliance is transforming into an important strategic lever.

- 59% of companies perform at least three logistics agility actions, though only 11% do so on a consistent basis.

- Just 13% of large enterprises say they have sufficient internal staffing for managing global supply chain and trade compliance processes.

B enchmark results show a wide disparity in global supply chain management capabilities. To measure how your company stacks up, use Table 1 to assess your global supply chain maturity across seven critical dimensions.

Table 1: Global Supply Chain Maturity Framework

Dimension	Laggard	Industry Average	Best in Class
Automation Level	Mostly manual and spreadsheet driven	Fragmented or departmental IT approach	End-to-end and cross-functional automation
Supply Chain Visibility	No visibility technology	Use homegrown visibility solution and logistics provider systems to monitor shipment status	Use commercial visibility solution to monitor order-line level status, inventory, and mobile assets
B2B Collaboration	Collaborate across 1 process across 1 tier of suppliers and customers	Collaborate across 2 processes across 2 supplier and customer tiers	Collaborate across 3+ processes across multiple supplier and customer tiers
Trade Compliance	Manual-intensive processes with little enterprise-wide consistency	Fragmented IT approach with separate import and export databases per country	Enterprise-wide trade compliance platform that includes preferential trade agreement optimization
Logistics Agility	Rarely perform logistics agility actions (e.g., in-transit order redirection, supplier drop ship)	Sometimes perform 3+ logistics agility actions	Frequently perform 3+ logistics agility actions
Staffing	In-house staffing	Use managed services or business process outsourcing (BPO) solution to augment staff	Use managed services or BPO solution to augment staff, supported by visibility and collaboration technology
Risk Management	Concerned about supply chain resiliency but taking no action	Assessing supply chain resiliency to risk-related events	Managing supply chain resiliency to risk-related events

This chapter will share corporate strategies around six of the most established dimensions: technology automation, supply chain visibility, B2B collaboration, trade compliance, logistics agility, and staffing. Chapter 3 covers an emerging area of concern: supply chain risk management.

Global Supply Chain Automation Plans

Companies are seeking to upgrade multiple facets of their global supply chain technology. Figure 4 shows the technology investment plans for organizations. All these investment areas are critical components for a comprehensive global supply chain automation portfolio. This report discusses key automation trends and emerging best practices for each area, with the exception of international transportation management technology, which will be covered in a separate Aberdeen report.

Figure 4: Global Supply Chain Technology Investment Areas over the Next 24 Months
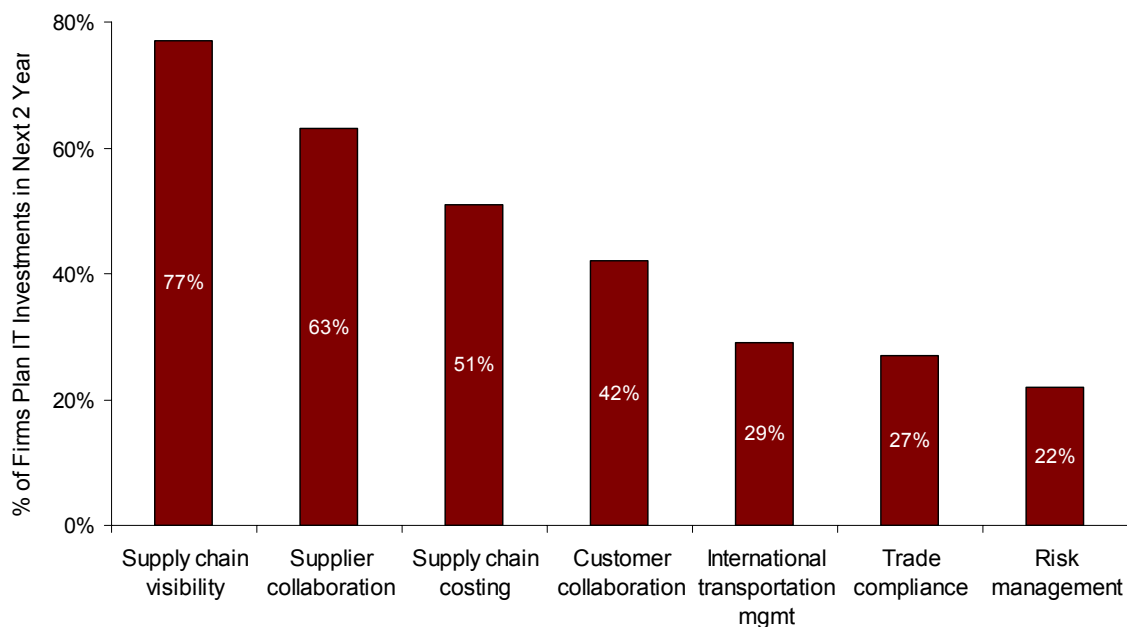
Especially notable is the renewed interest in supply chain costing as companies try to rectify the fact that their international cost projections are less granular and less accurate than domestic costs. "In our domestic supply chain, we can easily attribute freight costs and even understand the impact of truck fuel surcharges at a carton level," says a retail international transportation director. "But on the international side, we were challenged to answer even basic questions such as, 'What's the average ocean freight spend per month, by lane?' because we lacked integrated systems and normalized data."

Companies that have not yet audited their supply chain costing weaknesses and created a remediation plan should begin this process; it is the first step to ensuring more accurate and predictable budgets and total landed costs – and to identifying savings opportunities.

Visibility Improvement Plans

A number of C-level respondents particularly called out the lack of visibility as worrisome, expressing concern that it was very challenging to gain the visibility and integration needed across their inbound and outbound processes. These respondents ranged from senior executives at a small food provider, to a mid-size construction company, to a large industrial manufacturer.

To improve supply chain transparency and control, nearly two-thirds of companies report using some sort of visibility technology (Figure 5). This includes nearly a third who use a commercial visibility solution. About 15% of companies use both home-grown or commercial visibility technology as well as technology from their logistics provider (e.g., transportation carrier, third-party logistics provider, freight forwarder) or business process outsourcing (BPO) vendor.

Figure 5: Technologies Used for Global Visibility
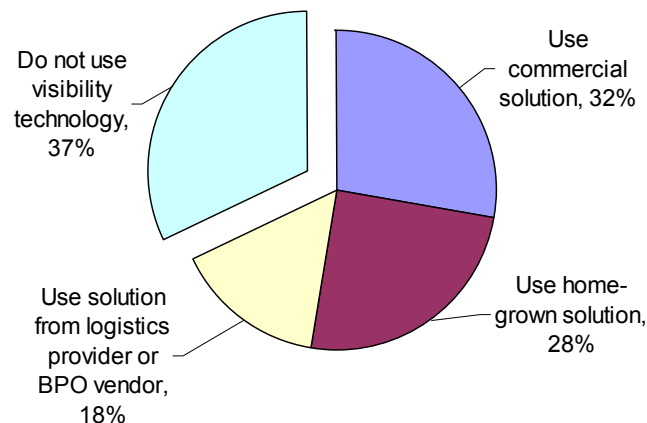
Source: Aberdeen*Group*, June 2006

About 45% of companies report tracking zero to two milestones or events for their typical international transaction, 28% track three to four milestones, and 27% track five or more milestones. Figure 6 shows the basic events tracked by companies (in boldface), as well as the events used by more advanced visibility users.

A common deployment mistake is to equate events with setting e-mail alerts against these milestones. Many companies that gain the most value from visibility solutions work hard to minimize the number of e-mail alerts used in order to prevent alert overload, which can drive staff away from using the system. Instead, they become masters at using exception reports and on-line task sheets to manage activity. For instance, a user may configure the system to deliver a daily report of orders in which the advance shipment notice does not match the purchase order line-item quantities or a report that identifies containers approaching the end of their free storage time at a deconsolidator.

Figure 6: Global Visibility -- What Companies Really Track

Source: Aberdeen*Group*, June 2006
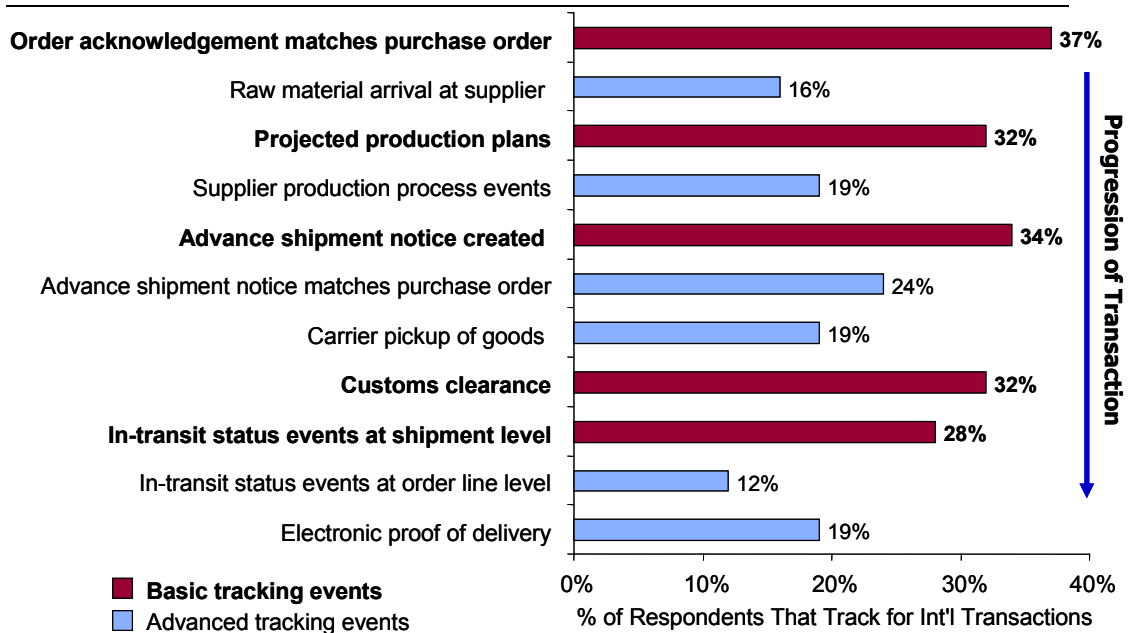
Top 10 Visibility Enhancements

Global visibility leads the planned IT investments by companies for their global supply chains. Table 2 shows the Top 10 visibility improvements planned by respondents.

Table 2: Top 10 Enhancements Planned for Global Visibility Solutions

Top 10 Enhancements Planned in Next 2 Years	% Respondents Planning to Enhance
1. **Expand number** of trading partners providing status information	54%
2. Incorporate **additional status events**	50%
3. Track **actual total landed cost** as shipment/order progresses	45%
4. Incorporate **resolution advice** or workflow (e.g., expedite advice)	45%
5. Add financial settlement or **financing triggers**	45%
6. Add **warning alerts** if actual events deviate from plan	44%
7. Add **RFID-enabled visibility**	43%
8. Add **escalation policies** to help manage alerts	43%
9. Performance trending and **root cause analysis**	42%
10. Add visibility into **mobile assets** (e.g., containers, equipment)	41%

Source: Aberdeen*Group*, June 2006

Scaling out visibility implementations across more trading partners and more events tops the priority list. In addition, 47% say they want to improve the data quality of the event messages, including timeliness, completeness, and accuracy of those messages.

Companies are on a path to take their visibility systems far beyond basic order and shipment tracking. They are looking to turn these systems into exception-based process management platforms that enable staff to manage exceptions rather than micro-managing steady-state processes. Key elements include escalation policies to ensure corrective action is being taken, incorporation of resolution advice or workflow (e.g., expedite options and policies for a late shipment), and performance trending and root cause analysis of disruptions and lead time fluctuations.

> Incorporating RFID data into their supply chain visibility solutions is on the roadmap for a surprising 43% of respondents.

Companies that view visibility systems as tactical problem detectors need to reassess their approach and consider revamping their strategy to focus more on profit-sensitive problem resolution and continuous improvement programs to reduce supply chain uncertainty and increase overall velocity.

Also ranking high on visibility enhancement plans are enhanced insight into current and time-phased end-to-end inventory positions – in motion and at rest, including vendor managed inventory – as well as mobile assets such as containers and equipment. A key future enabler for this is RFID technology. Incorporating RFID data into their visibility solutions is on the roadmap for a surprising 43% of respondents. In fact, respondents express concern that very few visibility systems today are set to handle RFID-tagged products, containers, or mobile assets and that global RFID standards are still in flux.

Moving toward Joint Finance and Supply Chain Visibility

Some 45% of respondents say they plan to add supply chain costing visibility and an equal number plan to add settlement or financing triggers. These are two of the areas in which CFO and supply chain executive issues collide.

- **Supply chain costing.** Global supply chain uncertainties ─ such as delayed or incomplete shipments leading to higher inventory buffers and freight expediting expenses ─ contribute to budget overruns and cash flow management challenges. In one Aberdeen study, fully 91% of companies reported that unexpected supply chain costs were eroding their anticipated low-cost country sourcing savings, with transportation budget overruns being the top culprit.

  Companies are seeking to manage more actively their transaction costs, even down to the order or ocean container level. For instance, a number of retailers report looking to expand their visibility solutions so they can see total landed cost build as transactions occur and identify discrepancies with cost targets. A company can then take action to protect its gross margins, such as shifting to a slower but lower cost of transportation for later legs of a shipment, ensuring product is moved before demurrage fees rise, or changing pricing or promotions.

- **Supply chain finance.** One of the hottest new areas emerging in global supply chain management is supply chain finance. A supply chain finance solution is a combination of trade financing services provided by an enterprise or a financial

institution and a technology platform that unites the trading partners electronically, thus streamlining and facilitating their relationship. Supply chain visibility platforms already capture critical data around purchase orders, shipment notifications, customs clearance, and the like. Fully 45% of respondents say they want to extend their visibility solution to add financial settlement and financing triggers.

> Supply chain finance is one of the hottest new areas in global supply chain management.

The CFO at a mid-size apparel manufacturer explains: "I'm looking to drive financial efficiencies through automation and increased visibility of order and payment status with our international vendors. But my hidden agenda is to leverage the same electronic trade backbone to create automation across my sourcing and logistics processes as well." Having a single backbone to serve all functions can greatly simplify processes and IT requirements and improve the ability to work cross-functionally.

For CFOs, one of the intriguing aspects of deploying a platform used jointly by the supply chain and financial organizations is the ability to trigger financial activities off a much richer set of milestone events, such as arrival at consolidator, vessel departure, customs clearance, or arrival at an inbound VMI hub. Each milestone is an opportunity to apply pre-, in-transit, or post-shipment inventory financing, early payment discounting, or payables extensions. In addition, supply chain financing pioneers are creating innovative ways for companies to use automation and new financial instruments to mitigate the cost of capital differences between buyers and low-cost country suppliers, thus lowering the overall cost structure of supply chains.

B2B Collaboration Improvement Plans

More companies are engaging in collaborative initiatives with their partners to improve global supply chain processes. Companies that still operate via arms-length transactions with serial processes between their trading partners are at a growing disadvantage in process speed, reliability, and agility.

The top processes for collaboration are visibility/alert management and resolution (57% of respondents), sales & operations planning (31%), transportation management (30%), forecasting (29%), and replenishment planning (25%). In total, 91% of respondents are doing some form of B2B collaboration today. Some 26% are collaborating in three or more process areas.

Only 13% report collaborating on product and packaging design, but this can drive significant savings for companies. For instance, some high tech companies have determined through interaction with logistics partners that it is more cost-effective to strengthen some of their products so they can have smaller, lighter-weight packaging and thus fit more pieces into a container load, decreasing overall transportation costs and creating a lower total landed cost.

Some 47% of respondents are collaborating with one tier of suppliers, 31% collaborate with two tiers, and 14% collaborate with three supplier tiers. These multi-tier collaborators consist of all multi-billion dollar enterprises across a variety of industries, including

aerospace, medical equipment, pharmaceuticals, industrial equipment, and high tech. On the customer-facing side, 71% of companies report some level of collaboration with two or more tiers of customers (e.g., distribution partners and large direct end customers).

B2B collaboration technology is still in its toddler stage of deployment. For instance, only a quarter of companies say they collaborate electronically using supplier collaboration technology with more than 20% of their suppliers; nearly 60% of respondents say they collaborate with fewer than 10% of their suppliers.

Still, even with limited B2B collaboration efforts and scant automation support, companies report cycle time and process reliability benefits. They have been able to speed up their planning and execution cycles and can reshape and react to demand faster than before. By exchanging richer information more quickly with trading partners, enterprises can also make more accurate plans and better midcourse corrections while improving cash-to-cash cycles.

Figure 7 shows that the most productive collaboration processes are collaborative forecasting, inventory management, and replenishment. In most categories, companies reported equal success in improving cycle times and process reliability. However, collaborative alert management and resolution is cited as effective in reducing cycle times by 62% of collaborating firms but has improved process reliability in just 32% of cases. This drives home the point that meaningful supply chain improvement requires not just tactical problem identification but systematic root cause analysis and remediation. Visibility veterans stress the importance of this analysis to improving process reliability.

Figure 7: B2B Collaboration Benefits with International Trading Partners
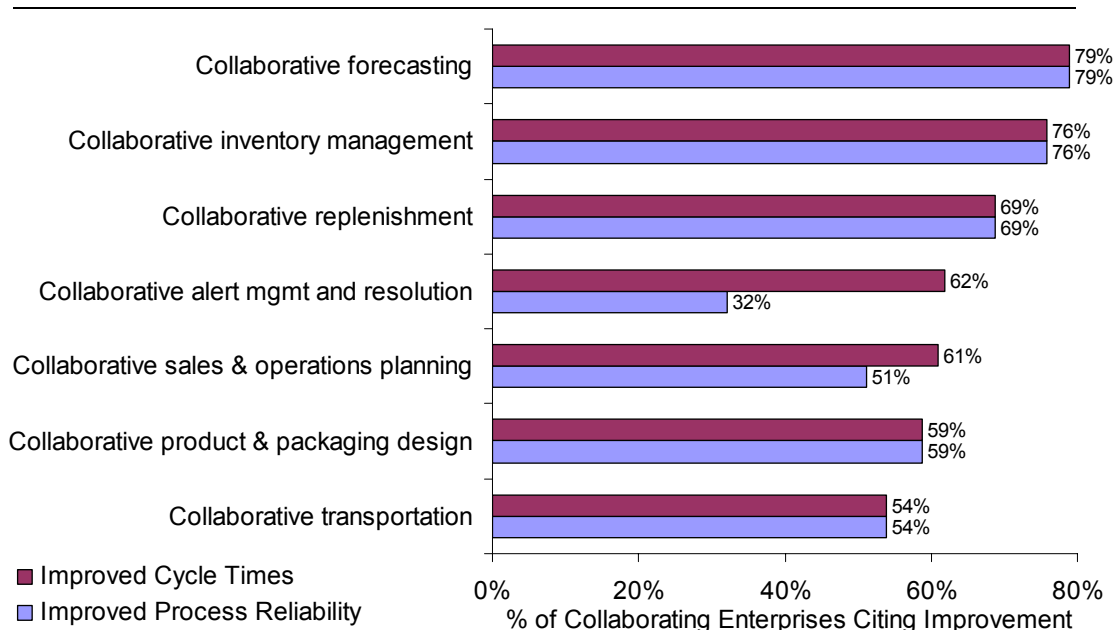
Source: Aberdeen*Group*, June 2006

To drive wider-spread adoption, the key is to make sure that a "collaboration" program isn't simple shifting labor requirements and cost onto the supplier. Suppliers also need to

enjoy automation benefits on their side and, ideally, financial benefits as well, perhaps in the form of financing benefits to help them improve cash flow or lower their cost of capital. In addition, a number of organizations can help improve supplier participation rates by providing daily enablement assistance and even on-ground support; these include B2B collaboration vendors, supply chain integration network providers, managed service vendors, global trade management platforms, and logistics partners.

Also ensure that B2B collaboration is being driven by the business process objective versus a technology capability. For instance, at many companies it is not important to collaborate beyond the first tier of suppliers or customers, while in other industries it is critical (e.g., for companies whose suppliers rely on highly constrained raw materials, firms that are dependent on multi-tier assembly processes, or companies seeking to minimize gray market activity and speculative purchasing).

Trade Compliance Improvement Plans

Trade compliance has traditionally been a difficult area in which to convince management to spend money for technology automation. However, this is changing:

- First, government scrutiny is increasing around areas such as import security and restricted party screenings for exports, so the fees and fines are becoming more onerous, as well as the risks of bad publicity for noncompliance.

- Second, manual compliance processes are becoming a much greater productivity drain as global trade becomes a larger part of a company's business.

- Third, it is becoming increasingly well-known that market leaders are gaining total landed cost advantages through origin management, which includes preferential treatment programs and free trade agreements (e.g., NAFTA, CAFTA, European Union, MercoSur), quota management, and the general process of using trade knowledge to help a company architect lower total landed costs from product design through final delivery.

Past Aberdeen research has shown that companies are funding improvements about equally across export compliance, import compliance, and origin management areas. However, North American companies are somewhat more likely to start first with export compliance automation, while European companies often begin with import compliance. Aberdeen research has shown that best-in-class performers – those companies reducing their total landed costs and documentation issues the most – are twice as likely to have current budgeted trade compliance projects as their peers.

> Renault has used the origin management information housed in its centralized trade compliance database to drive a whole new low-cost car.

As regulatory oversight intensifies, enterprises are finding increasing value in moving to a single trade compliance platform for the entire company that enables consistency of product classifications and restricted party screenings and provides a common view of compliance activity and trade costs.

Centralized trade management information is also a critical instrument for lowering the cost of goods sold. In fact, leading companies are architecting new products and sales

initiatives around trade compliance knowledge housed in automated compliance systems. Renault, for instance, has used the origin management information housed in its centralized trade compliance platform to drive a whole new low-cost car. Called the Logan, the vehicle is partially built in Western Europe and then exported to emerging markets for final assembly and sale. By setting manufacturing and distribution strategies based on maximizing free trade agreements and minimizing duties and taxes, Renault has been able to create a markedly lower total landed cost. Its compliance platform also tracks actual activity closely to ensure that currency fluctuations, etc., don't threaten these savings – which could potentially trigger much higher total landed costs than expected.

Logistics Agility Improvement Plans

Managing international logistics is not like managing an extended domestic supply chain; it's fundamentally a multi-party process fraught with greater unpredictability in quality, lead times, costs, and risks. Rather than create the absolute-lowest-cost fixed network, leaders are building into their logistics networks more points of flexibility. This helps them continually scan their environment for bottleneck symptoms or spikes in demand and take action.

Figure 8 shows the usage of some of the more common agility practices. Among survey respondents, 59% employ three or more of these practices at least sometimes. However, only 11% use three or more on a frequent, systematic basis. These pre-emptive organizations are just as likely to be mid-size companies as large enterprises. Their common attribute is that they are twice as likely to have highly automated supply chains as their peers. This automation enables them to cost-effectively manage global shipments and inventories in a much more aggressive and exception-based manner.

Figure 8: Global Logistics Agility Practices
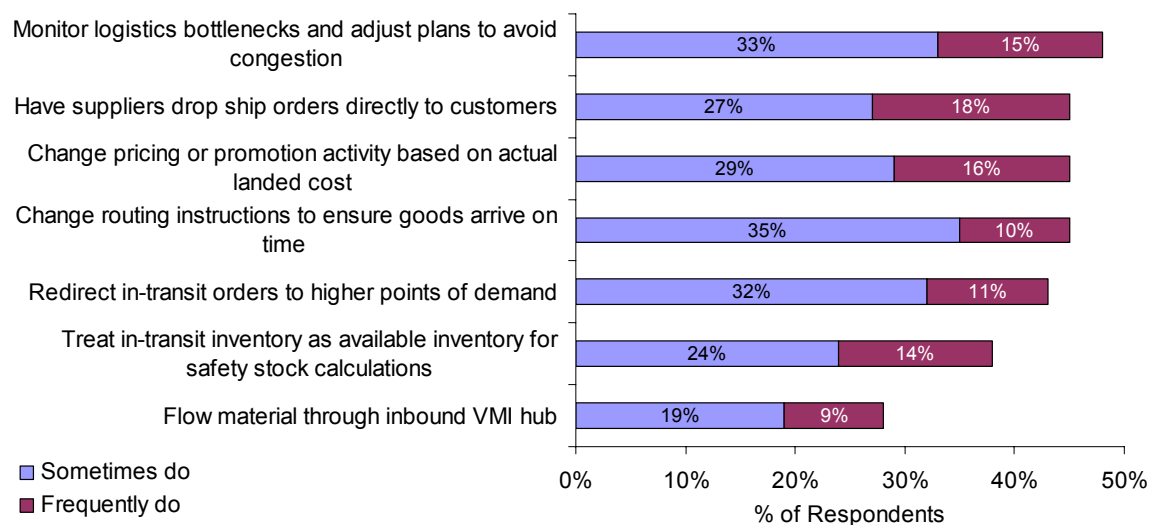
Source: Aberdeen*Group*, June 2006

One practice in which large enterprises do outstrip their smaller competitors is in supplier drop shipping. Some 35% of large enterprises report they have their international suppli-

ers drop ship more than 15% of their orders directly to their customers. Just 8% of small and midsize companies use drop shipping to this extent. This is a clear area of potential improvement, which can help cut lead times to customers and reduce pipeline inventory and related inventory liability exposure. A best practice for drop shipping is to use a B2B collaboration platform to insert monitoring and control points at the supplier, thus ensuring seamless delivery to your customer, including ensuring shipments follow your business rules for completeness, labeling, etc.

Needed: More Global Supply Chain Human Resources

Technology enablement is all well and good, but it's just part of the equation. Because of the degree of global supply chain uncertainty that must be managed on a daily basis, skilled human resources remain critical for success. However, just 13% of large enterprises say their company's staffing for managing global supply chain and trade compliance processes are fully adequate to meet their needs, although the figure rises to 36% for all respondents. Overall, results show that logistics service and managed service providers will be increasingly in demand to augment internal staff, as will full-scale BPO providers (Figure 9).
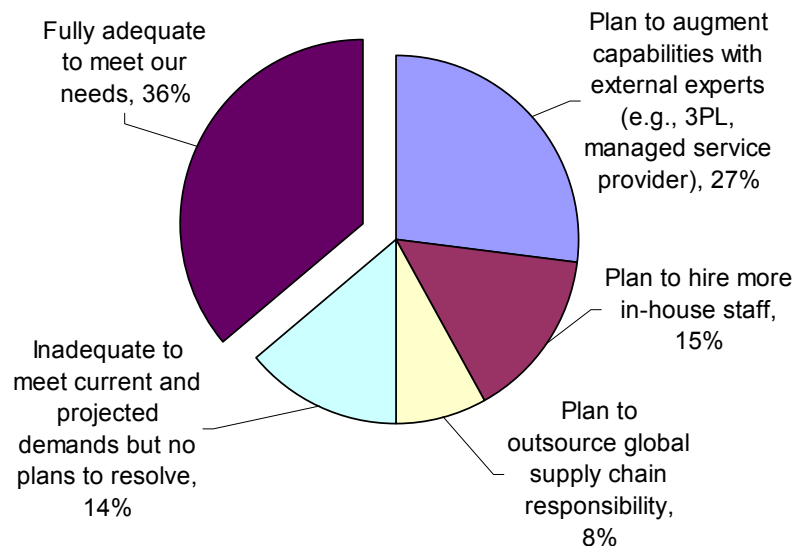
Figure 9: Internal Staffing Inadequacies for Global Supply Chain Processes

Source: Aberdeen*Group*, June 2006

Companies with staff constraints that have not yet explored the expanding options for augmenting staff with external experts should make sure to incorporate this into their strategy development process. Be sure to monitor and assess some of the emerging managed service offerings from technology vendors, consultants, financial institutions, and integrated logistics providers.

For the primary areas of global supply chain management, between 45% and 60% of firms would ideally prefer to use external help or completely outsource a function rather than rely solely on in-house staff power and knowledge (Figure 10). In general, large and midsize firms are more likely to be looking for staff augmentation or pro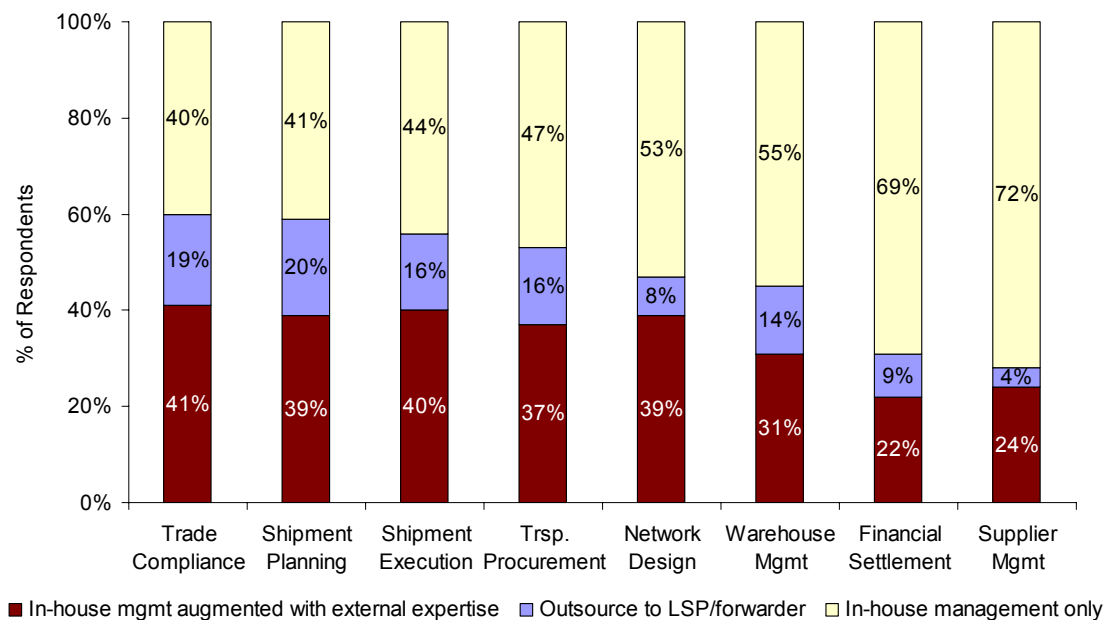cess outsourcing. The exception is in supplier management, where 30% of small firms (under $50 million in revenue) desire external help compared with 19% of large and midsize firms.

Figure 10: Preferred Strategy for Global Supply Chain Staffing, by Process Area

Source: AberdeenGroup, June 2006

Large enterprises are most likely to embrace managed services or business process outsourcing for global supply chain management, with 39% of large respondents reporting they currently use such a provider and 29% saying they plan to do so. However, Aberdeen best practice research shows that smaller organizations can benefit significantly by leveraging external resources. For instance, Redback Networks, a $125 million networking equipment manufacturer, reduced logistics costs by 30% and inventory deployed in the field by 50% when it outsourced its logistics network to a single logistics service provider with high-quality service and inventory visibility technology (see *Best Practices in International Logistics,* January 2006).

Chapter Three:
Supply Chain Risk Management

Key Takeaways

- 82% of companies are concerned about supply chain resiliency, yet only 11% are actively managing this risk.

- Large companies are most actively managing import and export compliance risks, but small and midsize companies lag dangerously behind in these areas.

- Increasing logistics and supply agility and improving visibility and automation of supply chain activity are the risk mitigation actions that companies believe will help the most.

Fully 82% of respondents report that their senior executives view supply chain resiliency as concerning (e.g., the ability to keep the supply chain moving when there is a loss of supplier or access to a supplier or logistics network). Yet only 11% are actively managing that risk (Figure 11). This action gap is one of the greatest weaknesses of current corporate global supply chain strategies; it threatens the continuity of a company's business and sets the stage for gross margin erosion due to under-managed supply chain uncertainty and risk.

Figure 11: Supply Chain Resiliency to Risk-Related Events
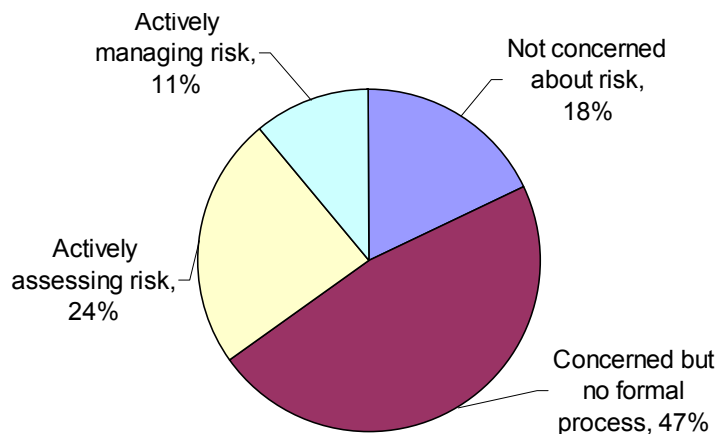
Source: Aberdeen*Group*, June 2006

Manual processes and limited visibility combined with the longer and more uncertain lead times from low-cost country sources contribute to business disruptions. In fact, a recent Aberdeen supply risk study found that 82% of companies experienced supply disruptions that caused them financial hardship within the past 24 months, and the average company experienced 12.9 such supply outages in the past year. (See *Supply Risk Management Benchmark*, September 2005.)

Disruptions can range from a container of specialty goods slowed by customs and port delays that misses its holiday selling window to physical damage at a supplier that can

result in catastrophic impact for a company. One example is a fire at a single-source supplier used by Ericsson, which resulted in $400 million dollars in lost sales for Ericsson, a drop in stock price of 11%, and the eventual exit of that part of the business.

As issues such as terrorism, tsunamis, hurricanes, and bird flu pandemics hit the popular press, senior executive concern is growing. This is not just because of the direct business continuity issues but also because of a fear of potential shareholder lawsuits if a company can't demonstrate that it had contingency plans in place for a "foreseeable" event.

Benchmarking Today's Risk Management Practices

Figure 12 shows a broader set of global supply chain risks. Companies are most actively managing import and export compliance risks, as well as mitigating Sarbanes-Oxley risks.

Figure 12: Supply Chain Risk Management Practices
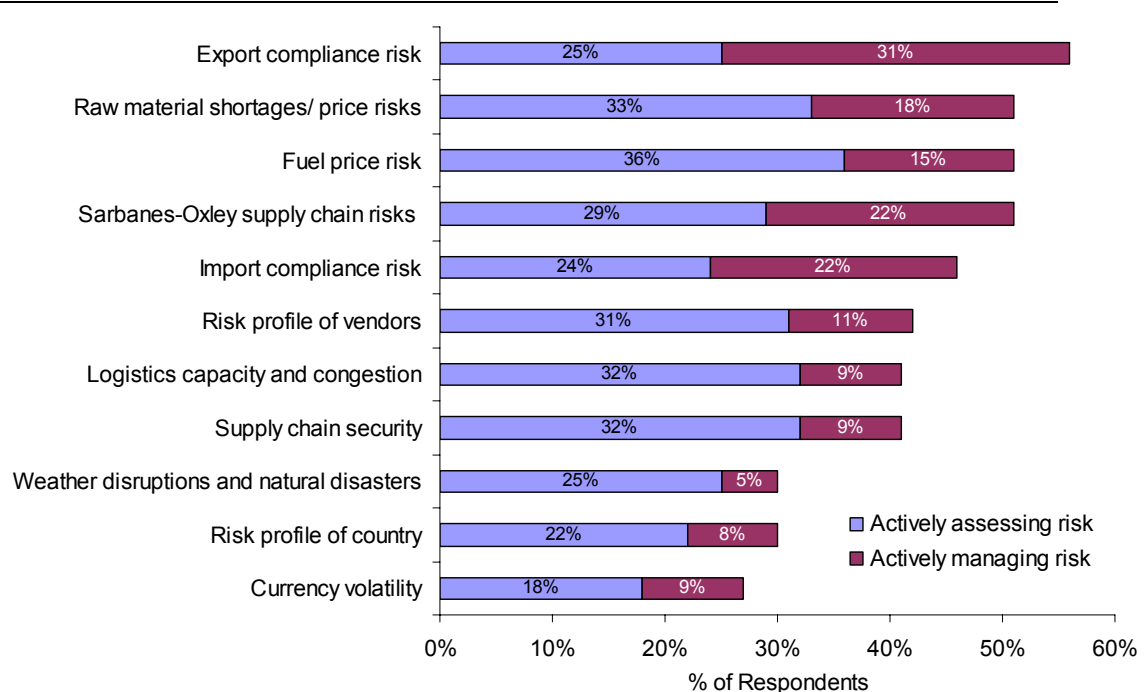
Source: Aberdeen*Group*, June 2006

In all areas but three, large, midsize, and small enterprises are about equal in their risk management maturity levels. The exceptions are:

- **Export compliance risks:** About 55% of large companies are actively managing export compliance risks vs. 23% of midsize and small companies. As small and midsize companies increase their global selling, this is an area that they need to address more effectively.

- **Import compliance risks:** Some 45% of large companies are actively managing import compliance risks vs. 14% of midsize and small companies. Be aware that

governments around the world are cracking down on import violations and in-creasing penalties and fines.

- **Currency volatility risk:** More than a quarter of large companies are actively managing risks around currency fluctuations vs. just 3% of midsize and small firms. Financial institutions and emerging multi-currency management platforms can help companies minimize their exposure in this area.

The gap between those companies actively managing risk rather than assessing the risk is alarming. But even more concerning is the number of companies that are concerned about risk but have no formal processes within their organization to address these issues. Table 3 shows the risk areas with the largest percentage of companies that have yet to start an assessment or management process.

> The gap between the number of companies actively *managing* supply chain risk versus just *assessing* the risk is alarming.

Table 3: Top 5 Gaps between Supply Chain Risk Concern and Action

Top 5 Gap Areas	% of Respondents Concerned But Lacking Formal Process to Address
1. Risk profile of vendors	56%
2. Supply chain security (e.g., terrorism, border and port security)	51%
3. Logistics capacity and congestion (including port strikes)	47%
4. Risk profile of country (e.g., political stability)	46%
5. Weather disruptions and natural disasters	44%

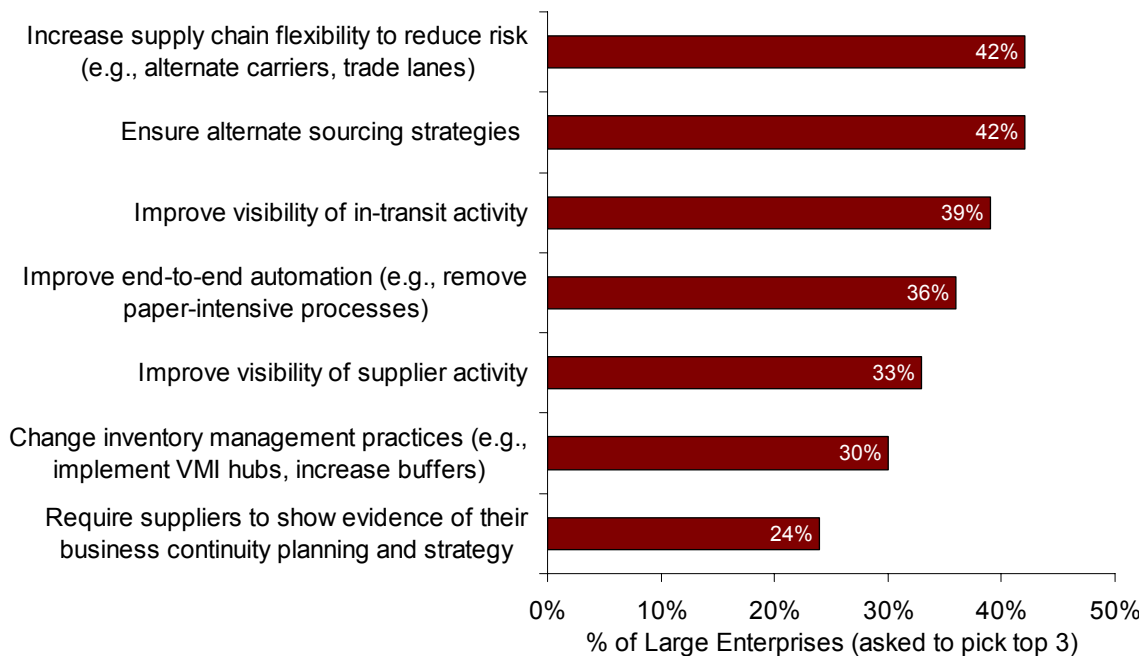Source: Aberdeen*Group*, June 2006

Priorities for Risk Management

To improve supply chain risk management, companies are focusing on two overarching strategies: (1) increasing logistics and supply agility by ensuring alternate suppliers, carriers, routes, and the like are arranged, and (2) improving visibility and automation of supply chain activity. Figure 13 shows the risk mitigation actions that large enterprises believe would help their companies the most.

Don't fall into the trap of focusing risk strategies just on events that can cause extreme business disruption. It is also important to assess supply chain uncertainties that cause continual erosion of supply chain performance and can lead to domino impacts such as ballooning inventory levels, longer customer lead times that threaten sales competitiveness, or frequent budget overruns because of expedited freight and use of higher-cost secondary carriers. By mitigating both catastrophic and daily supply chain risks, a company can achieve higher speed and more dependable supply chains on a daily basis as well as have an effective business continuity plan.

Figure 13: Large Enterprise Strategies for Risk Mitigation

Strategy	%
Increase supply chain flexibility to reduce risk (e.g., alternate carriers, trade lanes)	42%
Ensure alternate sourcing strategies	42%
Improve visibility of in-transit activity	39%
Improve end-to-end automation (e.g., remove paper-intensive processes)	36%
Improve visibility of supplier activity	33%
Change inventory management practices (e.g., implement VMI hubs, increase buffers)	30%
Require suppliers to show evidence of their business continuity planning and strategy	24%

% of Large Enterprises (asked to pick top 3)

Source: Aberdeen*Group*, June 2006

Emerging Tools and Services for Risk Management

A third of large enterprises are planning to invest in risk management and recovery planning technology. This is an emerging solution area, with more tailored commercial solutions now coming to market. Here's a summary of some of these offerings:

- **Risk assessment management tools and consulting services.** Business continuity consultants and technology providers are creating enhanced services and tools to help companies assess and manage supply chain risk. Some of these tools, for instance, help companies map the operational vulnerability of their product lines and the disaster preparedness of their supply chain partners. Companies can then assess and better manage these upstream continuity threats, which can threaten their supply of components, parts, ingredients, or the merchandise on their shelves.

- **Import/export compliance technology and services designed for corporate-wide risk management.** The emergence of trade compliance technology with service-oriented architectures makes it much easier for companies to embed risk mitigation steps into their current enterprise processes. For instance, companies can use Web services to create seamless processes that automatically trigger restricted party screenings and licensing checks at all appropriate points within a sales transaction: order taking, order changes, point of shipment, etc. Web services can also be used to enable the human resources department to screen new hires and contractors, sourcing departments to screen potential suppliers, and even security officers to screen visitors at facility reception desks.

- **Network design and inventory optimization tools tailored for risk assessment.** Most companies have only a gut feel for supply chain risk and have not quantitatively analyzed it. Supply chain network design tools and advanced inventory optimization software can be used by companies to quantify supply chain risk and create contingency plans. For instance, these tools can be used to perform a series of what-if analysis, such as if Country X closes down because of political instability, weather disaster, or disease, what will that do to our supply line? Will it drop to 50% or shut it down completely? These tools can also assess how just-in-time programs, critical raw material availability, and SKU proliferations can impact risk levels, among many other risk scenarios. In addition, they can help to create short-term and long-term crisis response plans.

- **Supply chain visibility tools configured for Sarbanes-Oxley risk mitigation and for disaster recovery.** CFOs are connecting the dots between a lack of supply chain visibility and increased Sarbanes-Oxley risks. Today's global supply chains make it harder to understand just when goods transfer hands and what the future inventory liability implications are for last minute orders, reallocated orders, late shipments, and diverted inventory. Visibility technology can help finance organizations address these concerns and gain full transparency of the financial implications, future and present.

  Visibility technology is also critical, of course, to recover effectively from a risk-related event. For instance, a number of companies report they were able to prevent their goods from getting "trapped" within the Hurricane Katrina disaster zone by using visibility systems to identify order and shipment status and location and determine within hours how to reroute goods.

- **Cargo security systems.** The trend of tighter border monitoring is continuing all over the world, led by the U.S. Government, which is in the early stages of taking major steps to ensure the security of cargo entering its borders. Potential ramifications may include requirements to interface to passive and active RFID data feeds to track and reconcile container contents, GPS and cellular feeds to track location, as well as detection devices that identify container intrusions or monitor for nuclear/chemical/biological weapons or materials.

- **Managed service providers and BPO vendors with expertise in managing supply chain risks.** When outsourcing processes or augmenting staff via a managed service provider, be sure to investigate their risk assessment, contingency planning, and recovery capabilities. Some providers have deep knowledge of global and local supplier and logistics network strengths and weaknesses that they can use to identify and mitigate your risks and improve your supply chain reliability.

Chapter Four:
# Recommendations for Action

Key Takeaways

- In-house developed technology ranks first in usage today but is last in companies' future adoption intentions.

- On-demand applications (also called "software as a service") are used today by the least number of respondents but win second place in popularity for future adoption.

- Focus on improving visibility, B2B collaboration, trade compliance, logistics agility, and risk management – but do so in pace with your current maturity level rather than a quantum leap.

G lobal supply chain automation, visibility, and risk management help companies lower their cycle times and reduce lead time variability, enabling smaller inventory investments, faster cash-to-cash cycles, and greater responsiveness to shifting end demand. However, as our benchmark results show, these areas are inadequately addressed at most companies. Respondents point to gaps in their existing enterprise systems as one of the challenges they have to overcome. For global supply chain processes, "seamless collaboration between islands of automation is one of the critical issues not well addressed by today's technologies," says a CIO respondent.

Companies' Changing Technology Sources

Figure 14 shows the technology sources for the global supply chain technology currently being used by respondents. Most companies use a combination of technology sources.

**Figure 14: Current Global Supply Chain Technology Providers**
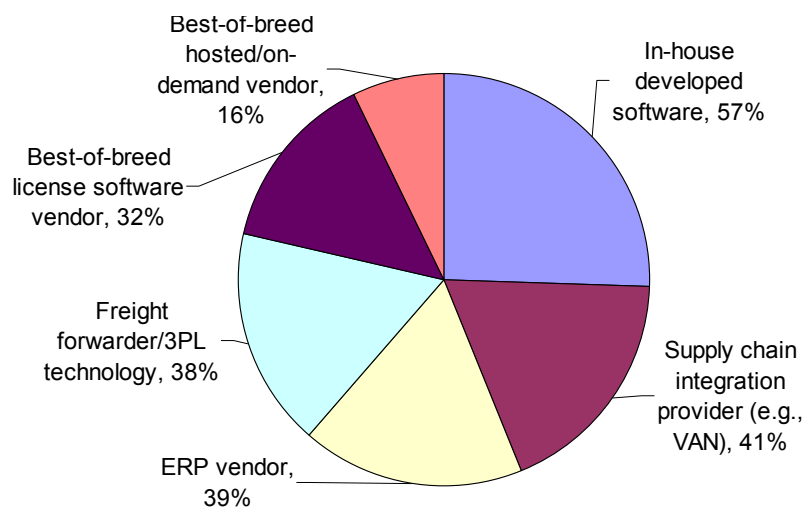
Source: Aberdeen*Group*, June 2006

More than half of respondents rely on in-house developed software, 48% use a best-of-breed license or on-demand application, 39% use their ERP system, and 38% use their freight forwarder's or third-party logistics provider's technology system. However, when asked about their plans to source additional global supply chain technology, their preferences shift notably in a number of areas (Figure 15).

Figure 15: Plans for Sourcing Additional Global Supply Chain Technology
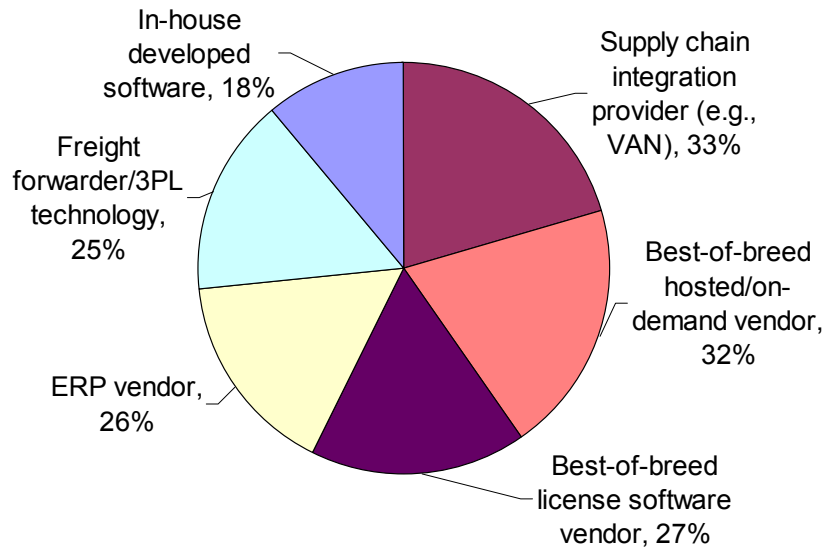
Source: Aberdeen*Group*, June 2006

Logistics service providers, ERP vendors, and best-of-breed license software vendors continue to be important technology sources. In addition, the often discussed "death of value added networks" is dispelled strongly by our benchmark results. Not only do 41% of enterprises currently use a VAN or other supply chain integration provider for electronic communication, but 33% more plan to deploy additional technology from these providers.

The biggest changes are occurring in:

- **On-demand applications.** On-demand applications (also called "software as a service" or hosted applications) are used today by the least number of respondents but they come in at second place in popularity for future adoption. Large enterprises are ahead of this curve, with 28% reporting they *already* use on-demand applications today for global supply chain automation. However, with more on-demand solutions emerging to meet mid-market requirements, midsize usage is set to grow.

- **In-house developed applications.** Custom-built applications rank first in current usage (used today by 57% of respondents) but they drop to last place for new technology implementations. If your enterprise is continuing to invest in in-house developed applications, take a step back and strongly question if this is the right approach. Few internal IT organization can keep up with the multi-million dollar

development investments that commercial technology and managed service providers are making for global supply chain automation.

Educate your company on the different sources of global supply chain technology and their pros and cons. For instance, ERP systems hold the promise of strong cross-functional workflow, while on-demand global supply chain platforms can deliver pre-connected communities of suppliers or logistics providers and faster ROI times. Technology capabilities, including integration into your back-end systems, should also be a paramount factor when selecting logistics service providers, business process outsourcers, or managed service vendors.

Global supply chain technology solutions are no longer only for large corporations: Technology and services from integrated logistics providers, on-demand global trade platforms, and managed service vendors are making supply chain visibility, restricted party screenings, classifications, total landed cost analysis, and electronic documentation accessible and affordable for midsize and smaller companies.

Recommendations for Laggards, Industry Average, and Best in Class Performers

Based on this study's benchmark results, following are four recommendations for action for those companies that lag in global supply chain maturity, those that are at industry average status, and those that are best-in-class performers. For a quick assessment of where your company stands today, use the Global Supply Chain Maturity Framework in Chapter 2. For further insight into many of these areas, see Appendix B for related Aberdeen reports.

Recommended Actions for Laggards

1. *Implement supply chain visibility.* If you don't have the internal resources to purchase or support a system, then turn to an on-demand solution or look to leverage the technology of your transportation carriers, freight forwarders, or third-party logistics providers. Cargo portals are another alternative for shipment-level visibility.

2. *Start B2B collaboration.* Based on benchmark results of cycle time and process reliability improvements, companies should focus first on collaborative forecasting, inventory management, and replenishment with their international business partners.

3. *Shore up trade compliance gaps.* Make sure your bases are covered for import and export compliance risks, including restricted party screenings and license determinations. On-demand offerings from technology vendors or logistics providers can fast track this process. Frequently, North American companies start trade compliance initiatives by focusing on export compliance while European companies are more likely to focus first on import compliance.

4. *Assess supply chain risks.* Identify critical materials, sole-source suppliers, and high-risk country sources and begin to create contingency plans.

Recommended Actions for Industry Average Companies

1. *Extend supply chain visibility.* Move to exception-based management of global supply chain activities and slowly increase the number of milestones you monitor. Start executing against a longer-term roadmap that adds escalation policies, inventory pipeline visibility, mobile asset management, root cause analysis, and financial settlement and financing integration.

2. *Scale B2B collaboration.* To drive B2B collaboration across more suppliers, make sure that a "collaboration" program isn't simple shifting labor requirements and cost onto the supplier. Suppliers also need to enjoy automation benefits on their side and, ideally, financial benefits as well, perhaps in the form of financing benefits to help them improve cash flow or lower their cost of capital. In addition, consider using a technology vendor, managed service, or other provider that can help your organization improve supplier participation rates by providing daily enablement assistance and even on-ground support.

3. *Move toward a corporate-wide trade compliance platform.* This system can be in-house, on-demand, or delivered as part of a managed service process. The key is that there is a data platform for product classification consistency, streamlined document production, and central cost and risk analysis.

4. *Actively manage supply chain risk.* Increase logistics and supply agility and improve visibility and automation of supply chain activities. Institute supplier remediation programs for high-risk providers.

Recommended Actions for Best-in-Class Companies

1. *Evolve to advanced visibility with resolution workflow, transaction cost monitoring, RFID support, and six sigma analysis.* Link visibility programs to six sigma initiatives to identify and mitigate bottlenecks and recurring variability. This is proving instrumental in reducing lead times and lowering inventories.

2. *Deepen B2B collaboration.* Advance your collaboration capabilities to support system-to-system information sharing, detailed visibility into events, and exception workflows built into purchase-to-pay and order-to-cash processes. Look to additional collaboration opportunity areas such as transportation management and product and packaging design.

3. *Focus on origin management.* Compliance leaders have documented millions of dollars of savings by better automating their origin management programs and understanding how to use preferential trade agreements in their product design, sourcing, and distribution decisions. Automated origin tracking, management, and auditability are keys to enjoying widespread benefits; it is very daunting and labor-intensive to run trade agreement programs and maximize the value for your company through a manual process.

4. *Optimize risk management.* Employ network design and inventory optimization tools to quantify supply chain risk and create short-term and long-term crisis response plans.

Featured Sponsors

IBM is the world's largest information technology company, with 80 years of leadership in helping businesses innovate. Drawing on resources from across IBM and key business partners, IBM offers a wide range of services, solutions and technologies that enable companies to take full advantage of the on demand era. IBM has the world's largest supply-chain management consulting practice in the world, with over 9,000 experts. These consultants will draw on the collective knowledge of IBM's 15,000 additional supply chain experts across the company to deliver the new Business Transformation Outsourcing services to clients.

Sockeye Solutions' supply chain software enables companies to improve multi-tier supply chain performance with speed and efficiency through inventory reduction, increased profitability and reduced risk. Designed specifically to address customers' unique supply chain needs and challenges, Sockeye's flexible and adaptive technology enables customers to deploy collaborative business processes with ease while delivering maximum supply chain velocity, improved visibility and reduced risk.

TRADEBEAM
Improving Global Trade

TradeBeam is a Global Trade Management (GTM) company providing software and services. The on-demand applications are integrated into one platform that allows corporations to manage their global orders, control global shipments and optimize global finance. Managing global trade involves two parallel and interrelated supply chains - the physical and the financial. By sharing data between the two chains throughout an international transaction TradeBeam helps corporations save time and improve working capital for order-to-cash and procure-to-pay cycles.

Management Dynamics Inc.
POWERING GLOBAL TRADE®

Management Dynamics is a leading provider of global trade management solutions that improve the performance of global supply chains for importers, exporters, logistics service providers, and carriers. The company's solutions synchronize the flow of information among trading partners, optimize supply chain execution decisions, and streamline import and export processes to ensure regulatory compliance and minimize cost and risk involved in cross-border transactions. Management Dynamics' time-proven solutions are used by more than 13,000 global users at some of the world's most successful 3PLs, carriers, manufacturers, retailers, and high technology companies.

Sponsor Directory

IBM IBM Corporation Armonk, New York 10504 914-499-1900 www.ibm.com csciacca@us.ibm.com	**Sockeye Solutions** 200 Adelaide Street West, Suite 300 Toronto, ON Canada M5H 1W7 416-593-8555 ext: 263 www.sockeyesolutions.com info@sockeyesolutions.com
TradeBeam TradeBeam 2 Waters Park Dr., Suite 200 San Mateo, CA 94403 650-653-7211 www.tradebeam.com ipogrebinsky@tradebeam.com	**Management Dynamics** Management Dynamics, Inc. One Meadowlands Plaza East Rutherford, NJ 07071 201-935-8588 www.managementdynamics.com mailto:solutions@managementdynamics.com

Author Profile

Beth Enslow
Senior Vice President, Enterprise Research
Aberdeen*Group*, Inc.

Beth Enslow is senior vice president of enterprise research for Aberdeen*Group*. Enslow benchmarks and advises companies on how they can reshape their supply chain, global trade, and transportation processes and technology strategies to drive business value.

Prior to joining Aberdeen*Group*, Enslow was senior vice president of strategic development for Descartes Systems Group, a global supply chain software company. At Descartes, she led initiatives in such areas as RFID, wireless-enabled delivery, and inventory performance management. Before that, Enslow was research director at Gartner, Inc., where she ran its supply chain planning and logistics advisory practice on a global basis. She has worked for a number of other research and consulting organizations, including the Conference Board, a leading business think tank and economic forecasting organization. Enslow is also a lecturer on supply chain technology at the Center for Supply Chain and Logistics Management at York University's Schulich School of Business in Toronto.

Appendix A:
Research Methodology

B etween May and June 2006, Aberdeen*Group* examined the global supply chain pressures and technology priorities of more than 150 enterprises. Responding supply chain executives completed an online survey that included questions designed to determine the following:

- Enterprise perceptions on which global supply chain process and application enhancements are most critical for their success

- Enterprise practices and plans for supply chain risk management

- Enterprise intentions for technology adoption

Aberdeen supplemented this online survey effort with telephone interviews with select companies, gathering additional information on global supply chain pressures and plans.

The study aimed to identify the priorities for global supply chain technology and service adoption and provide frameworks and benchmarks by which readers could assess their own plans.

Demographics of respondents include:

- *Job title/function*: The research sample included respondents with the following job titles: 16% C-level executives, 29% vice president/senior vice president, 31% director or manager, 18% internal consultants, and 6% staff and other.

- *Industry*: The research sample included respondents from consumer goods and distribution (16%), high tech (15%), apparel (13%), aerospace & defense (10%), and construction/engineering (10%). Other industries represented included retail, industrial manufacturing and chemicals/pharmaceuticals.

- *Company size*: About 30% of respondents were from large enterprises (annual revenues of US$1 billion or greater); 48% were from midsize enterprises (annual revenues between $50 million and $999 million); and 22% of respondents were from small businesses (annual revenues of less than $50 million).

Solution providers recognized as sponsors of this report were solicited after the fact and had no influence on the direction or results of the report. Their sponsorship has made it possible for Aberdeen*Group* to make these findings available to readers at no charge.

Appendix B:
Related Aberdeen Research

Related Aberdeen research that forms a companion or reference to this report includes:

- [Turning Your CFO Into a Supply Chain Cheerleader](#) (June 2006)
- [New Paradigm Supply Chain Finance Offerings Compel CFO and Treasury Interest in the Supply Chain](#) (April 2006)
- [Rethinking China Sourcing: From Total Landed Cost to Total Delivered Profit](#) (January 2006)
- [The Executive Guide to Global Trade: How Large Enterprises Are Driving Regulatory Compliance and Financial Improvement](#) (December 2005)
- [Best Practices in International Logistics](#) (January 2006)
- [The New Buying Guide for Trade Compliance Technology](#) (December 2005)
- [The CFO's Agenda for Global Trade](#) (September 2005)
- [Supply Risk Management Benchmark](#) (September 2005)
- [Grappling with Globalization: A Blueprint for Global Trade Management](#) (August 2005)
- [Are Your Inventory Management Practices Outdated?](#) (March 2005)
- [New Strategies for Global Trade Management](#) (March 2005)
- [Global Visibility: Be Nosy with Your Suppliers If You Want to Be Best in Class](#) (August 2004)

Information on these and other Aberdeen publications can be found at www.aberdeen.com.

About
Aberdeen*Group*

Our Mission

To be the trusted advisor and business value research destination of choice for the Global Business Executive.

Our Approach

Aberdeen delivers unbiased, primary research that helps enterprises derive tangible business value from technology-enabled solutions. Through continuous benchmarking and analysis of value chain practices, Aberdeen offers a unique mix of research, tools, and services to help Global Business Executives accomplish the following:

- IMPROVE the financial and competitive position of their business now
- PRIORITIZE operational improvement areas to drive immediate, tangible value to their business
- LEVERAGE information technology for tangible business value.

Aberdeen also offers selected solution providers fact-based tools and services to empower and equip them to accomplish the following:

- CREATE DEMAND, by reaching the right level of executives in companies where their solutions can deliver differentiated results
- ACCELERATE SALES, by accessing executive decision-makers who need a solution and arming the sales team with fact-based differentiation around business impact
- EXPAND CUSTOMERS, by fortifying their value proposition with independent fact-based research and demonstrating installed base proof points

Our History of Integrity

Aberdeen was founded in 1988 to conduct fact-based, unbiased research that delivers tangible value to executives trying to advance their businesses with technology-enabled solutions.

Aberdeen's integrity has always been and always will be beyond reproach. We provide independent research and analysis of the dynamics underlying specific technology-enabled business strategies, market trends, and technology solutions. While some reports or portions of reports may be underwritten by corporate sponsors, Aberdeen's research findings are never influenced by any of these sponsors.

Founded in 1988, Aberdeen*Group* is the technology-driven research destination of choice for the global business executive. Aberdeen*Group* has over 100,000 research members in over 36 countries around the world that both participate in and direct the most comprehensive technology-driven value chain research in the market. Through its continued fact-based research, benchmarking, and actionable analysis, Aberdeen*Group* offers global business and technology executives a unique mix of actionable research, KPIs, tools, and services.

THIS DOCUMENT IS FOR ELECTRONIC DELIVERY ONLY

The following acts are strictly prohibited:
- ## Reproduction for Sale
- ## Transmittal via the Internet

Terms and Conditions

Usage Tips

Report viewing in this PDF format offers several benefits:
- **Table of Contents:** A dynamic Table of Contents (TOC) helps you navigate through the report. Simply select "Show Bookmarks" from the "Windows" menu, or click on the bookmark icon (fourth icon from the left on the standard toolbar) to access this feature. The TOC is both expandable and collapsible; simply click on the plus sign to the left of the chapter titles listed in the TOC. This feature enables you to change your view of the TOC, depending on whether you would rather see an overview of the report or focus on any given chapter in greater depth.
- **Scroll Bar:** Another online navigation feature can be accessed from the scroll bar to the right of your document window. By dragging the scroll bar, you can easily navigate through the entire document page by page. If you continue to press the mouse button while dragging the scroll bar, Acrobat Reader will list each page number as you scroll. This feature is helpful if you are searching for a specific page reference.
- **Text-Based Searching:** The PDF format also offers online text-based searching capabilities. This can be a great asset if you are searching for references to a specific type of technology or any other elements within the report.
- **Reader Guide:** To further explore the benefits of the PDF file format, please consult the Reader Guide available from the Help menu.