Aberdeen*Group*

RFID-Enabled Logistics Asset Management

Improving Capital Utilization, Increasing Availability, and Lowering Total Operational Costs

June 2004

Sponsored by

Deloitte.

TrenStar
One Smart Move

WhereNet

Executive Summary

Many enterprises use logistics assets that have a circular flow within their distribution network. Assets with a circular flow are reusable with intrinsic value. These include totes used to deliver goods to stores, racks to deliver milk and bread to groceries, bins and roll cages to move parts from suppliers to assembly plants, shipping containers, rental equipment, and refillable liquid or gas containers. Reusable assets are a significant capital expense for the enterprise, and their management and maintenance is resource-intensive. Almost half of the respondents report that logistics asset operations consume 5% or more of corporate revenue and almost one-fifth say it consumes more than one tenth of revenue. Moreover, theft, damage and misplacement often erode asset productivity. For instance, a quarter of companies report losing more than a tenth of their container fleet annually.

The constant demand for new efficiencies and savings on a yearly budget basis has increased enterprises' interest in reducing these expenses. Two general approaches exist: (1) apply new asset management technology to better control the in-house process or (2) outsource the asset ownership or management process to a pooled asset provider or logistics service provider.

Key Business Value Findings

Aberdeen's RFID-*Enabled Logistics Asset Management Benchmark Report* found that a third of companies see the effective management of these assets as differentiating and key to customer growth and retention. The critical customer service value of asset management is often overlooked by corporate management. These assets are often mandated by customers to control the presentation of their goods to the retail consumer (e.g., display cases) or to the manufacturing line (e.g., automotive assembly lines). Companies also see asset management as key to managing costs and profit growth.

A tenth to a fifth of companies report that employing logistics asset management solutions has improved performance 7% or more in these areas: reducing chargebacks, reducing total costs, improving profits and growing revenue. Beyond these financial accomplishments, the availability of assets in the right place — and in compliance with customer mandates — are the number one benefits claimed for effective logistics asset management. Combined, these benefits improve customer service measured as an increase in customer retention: Thirty-one percent of respondents report that their existing technology-supported asset management operations had delivered more than 7% improvement in customer retention.

Implications and Analysis

Despite the benefits of logistics asset management, three fourths of respondents consider their current IT systems ineffective in supporting these operations. Moreover, half of the processes used for tracking and managing assets are currently manual. Many of the respondents recognize that this is an untenable situation. Fully half of them plan to tag existing assets with RFID tags. (Today, only a tenth has done any type of serialization on their logistics assets.) This investment is coupled with two-thirds of companies that plan

All print and electronic rights are the property of Aberdeen Group © 2004.

on investing to improve logistics asset management functions in multiple areas (e.g., visibility of assets in transit, availability management of assets, disruption management, transportation planning, general asset management and maintenance management solutions). All of these areas will benefit from RFID data.

Recommendations for Action

- Tag existing assets, preferably with RFID tags, and implement tracking systems that will use the information.
- Companies should segment the logistics asset management areas in which they have true domain expertise and advantage from those in which they are average or below par. Leverage logistics service providers, or industry pools, to provide domain expertise and technical assistance in areas where the enterprise is weak.
- Put a key performance indicator (KPI) program in place. It is not cost-effective or feasible to have customer-focused logistics asset management capabilities without having the means to assess your performance, determine corrective actions, and support continuous improvement programs.

All print and electronic rights are the property of Aberdeen Group © 2004.

Table of Contents

All print and electronic rights are the property of Aberdeen Group © 2004.

Table of Contents

All print and electronic rights are the property of Aberdeen Group © 2004.

Figures

Tables

All print and electronic rights are the property of Aberdeen Group © 2004.

Chapter One:
Issues at Hand

Key Takeaways

- Logistics asset management consumes a significant portion of corporate cash and capital, and this percentage of revenue is growing.
- Effective logistics asset management is a differentiator in the marketplace and is key to consistent customer satisfaction.
- Existing solutions are not doing a good job of supporting logistics asset management operations.

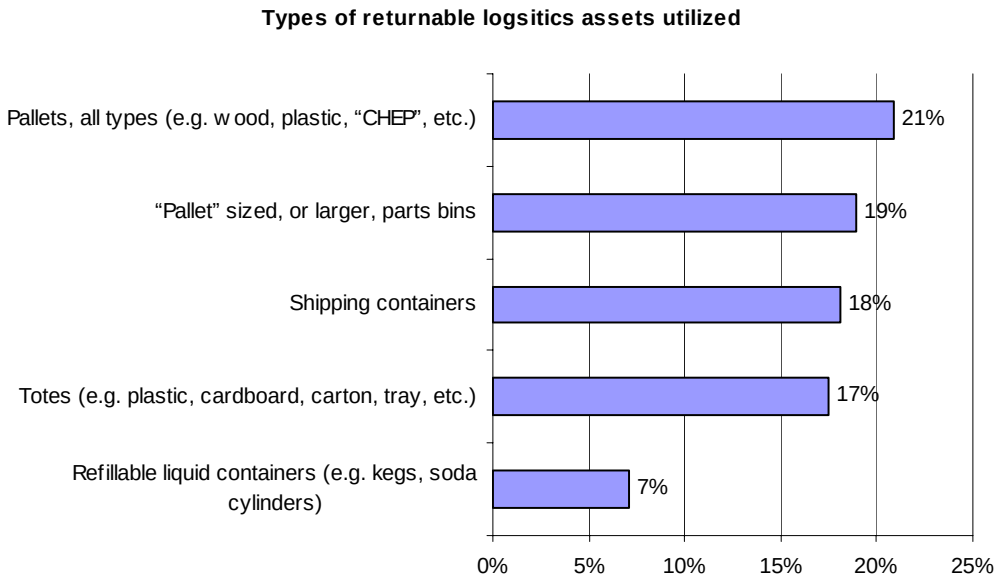
The Demand for Logistics Asset Management

Logistics asset management is the basic corporate activity of managing the availability and serviceability of assets used to move, store, secure, protect, and control inventory. This activity includes all warehousing, transportation (both to the customer or supplier and the return from the associated remote locations), and service functions, as well as any additional functions used to make these primary activities more effective. Logistics asset management includes many types of assets (Figure 1).

The assets of mobile logistics asset management are often in the hands of other entities (suppliers, customers, logistics providers, carriers, etc.) and out of sight and control of the owning entity, which is a great difficulty. These assets are expensive both in terms of capital and cash. The average respondent spends 4% of annual revenues on logistics assets, whereas almost one-fifth of respondents spend more than a tenth of revenue. The annual costs include the replacement of lost or damaged containers/logistics assets; twenty-five percent of companies say they lose in excess of a tenth of their container fleet each year. These assets are often mandated by customers to control the presentation of their contents to the retail consumer (e.g., display cases) or to the manufacturing line (e.g., automotive assembly lines). Fully three fourths of respondents believe their supporting IT solutions fail to meet their operational requirements well: Fifty percent of their asset management processes are totally manual. Coupled with the recognition that effectively managed logistics assets significantly drive customer satisfaction and retention these issues are fueling purchasing decisions. Over the next 24 months, two-thirds of respondents plan to invest heavily in better asset management solutions.

All print and electronic rights are the property of Aberdeen Group © 2004.

Figure 1: Mobile Logistics Assets



Source: Aberdeen Group, June 2004

Logistics Asset Management Is a Significant, Growing Expense

Logistics asset expenses consume significant corporate resources, so creating a more-effective logistics asset management process is critical. Almost half of the respondents report that logistics asset operations consume 5% or more of corporate revenue, and almost one-fifth say it consumes more than a tenth of revenue. Also, nearly half of respondents expect this consumption of corporate cash to increase over the next three years, with almost half expecting that increase to be more than 2% of revenue. Large companies (more than $1 billion in revenue) are most likely to experience 2%+ increases.

These expense figures include the loss and replacement of logistics assets. Twenty-five percent of all respondents a tenth or more of their asset fleet annually, with 10% losing more than 15%. This number grows to one-third for large companies, whereas one-fifth of smaller companies (less than $250 million in revenue) experience losses of a tenth or more. Logistics assets can cost as little as $100 apiece to well into the thousands of dollars. For instance, when an automotive company designs a new model, new parts bins will be needed for most assembly line functions. This capital investment can easily reach into millions of dollars.

Logistics Asset Management is Differentiating

Companies overwhelmingly believe logistics asset management differentiates their abilities to compete effectively, and to meet their customer's requirements and expectations. Companies recognize that the availability of the assets in the right place at the right time is key to maintaining their production operations and to managing the flow of goods from their suppliers and/or to their customers. They recognize that the construction of the assets themselves is specifically designed to protect and secure the products or raw materi-

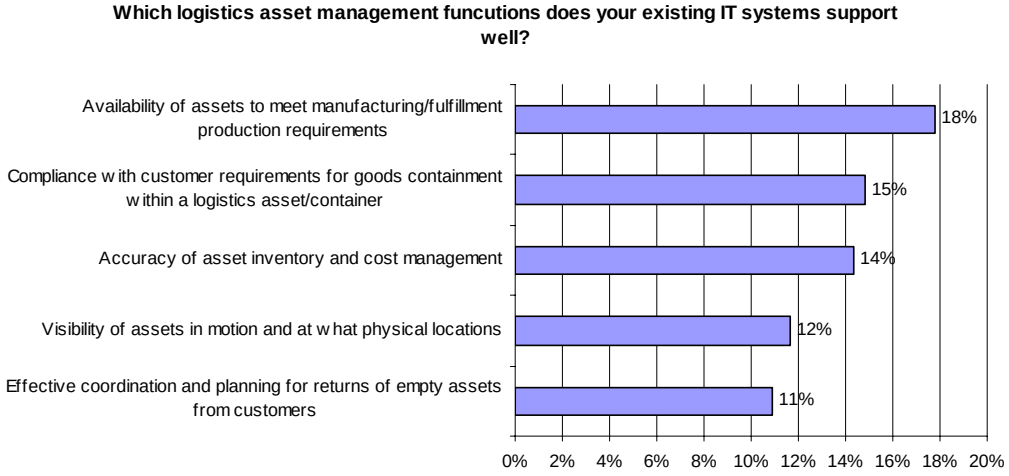
All print and electronic rights are the property of Aberdeen Group © 2004.

als to insure that they arrive as the same, high-quality products they were when placed in the container/asset: Delivery of the product on time in a quality state is key to customer satisfaction and retention, and ultimately, profitability and revenue growth.

Existing Solutions Are Not Doing the Job

Even though survey respondents believe that effective logistics asset management is differentiating, very few of them are confident in the existing technology solutions that are supposed to support order fulfillment operations (Figure 2). Fully half of the existing processes are supported manually. No technology function had more than a 19% satisfaction level, and the average was 11%. These results indicate that companies have been achieving logistics asset management differentiation "by the sweat of their brow." Essentially, the current installed systems are not keeping pace with companies' asset management requirements, processes, and objectives. As discussed in chapter three, this is causing a majority of companies to make plans to invest in technology system extensions or replacements over the next 12 to 24 months. Those companies not planning technology system enhancements will see their competition gain ground in customer service and cost efficiency where logistics assets matter.

Figure 2: Existing Technology Support for Logistics Asset Management Functions



Source: Aberdeen Group, June 2004

All print and electronic rights are the property of Aberdeen Group © 2004.

Chapter Two:
Key Business Value Findings

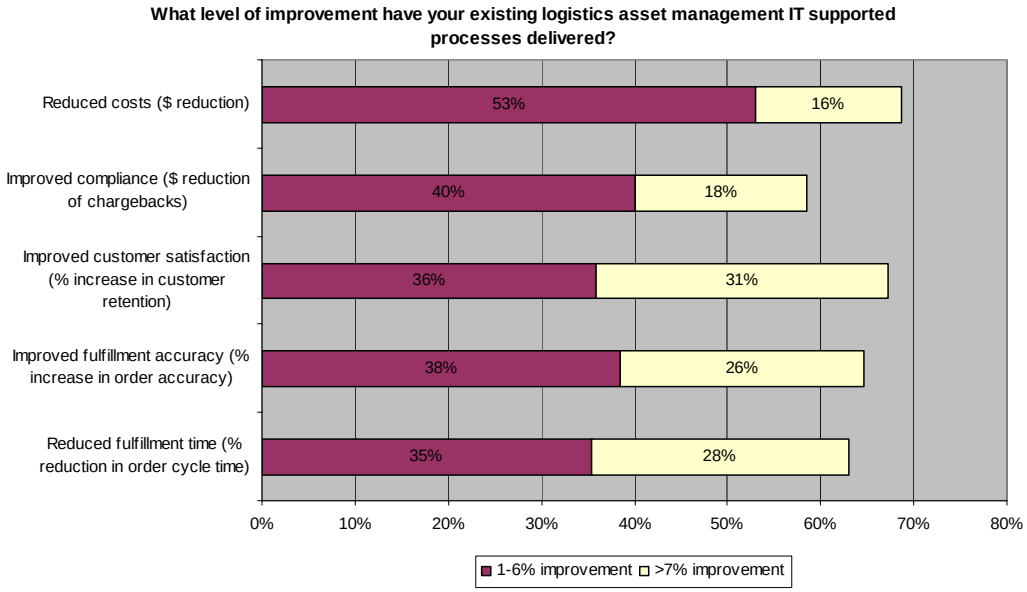
Key Takeaways

- Existing logistics assets management processes are responsible for significant improvements in enterprise performance.
- RFID is key to required system improvements.
- Visibility to availability of assets, asset inventory, and cost control are the most difficult functions to execute.

Existing Systems Deliver Benefits – But at a Cost

Despite a strong reliance on manual logistics asset management processes and weak votes of confidence in existing IT solutions, survey respondents reported significant benefits. The benefit areas we surveyed include cost reduction, improvement in revenues and profits, reduced fulfillment times, improved fulfillment accuracy, and reduction in mandate-related costs. All of these areas contribute to improved customer service measured as an increase in customer retention. In this most important overall measure, one-third of respondents indicated that their existing, IT-supported operations had delivered more than 7% improvement (Figure 3), reinforcing the customer service value of asset management. The cost is that these benefits are derived from hard labor via manual processes that require significant management attention and intervention.

Figure 3: Benefits from Existing IT-Supported Processes



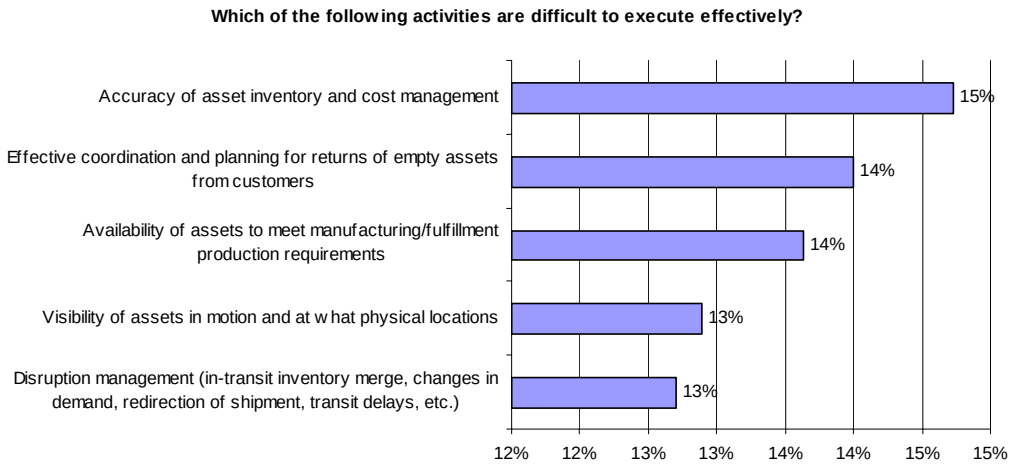
Source: Aberdeen Group, June 2004

All print and electronic rights are the property of Aberdeen Group © 2004.

The Challenges

Companies report that managing asset availability, having an accurate inventory of those assets, and coordinating the movement of those assets are among the most difficult tasks to execute (Figure 4). Management devotes most of its daily attention to these areas. In essence, the current systems do not enable management to work effectively and efficiently.

Figure 4: Logistics Asset Management Challenges



Source: Aberdeen Group, June 2004

Availability of Assets and Compliance Is a Differentiating Factor

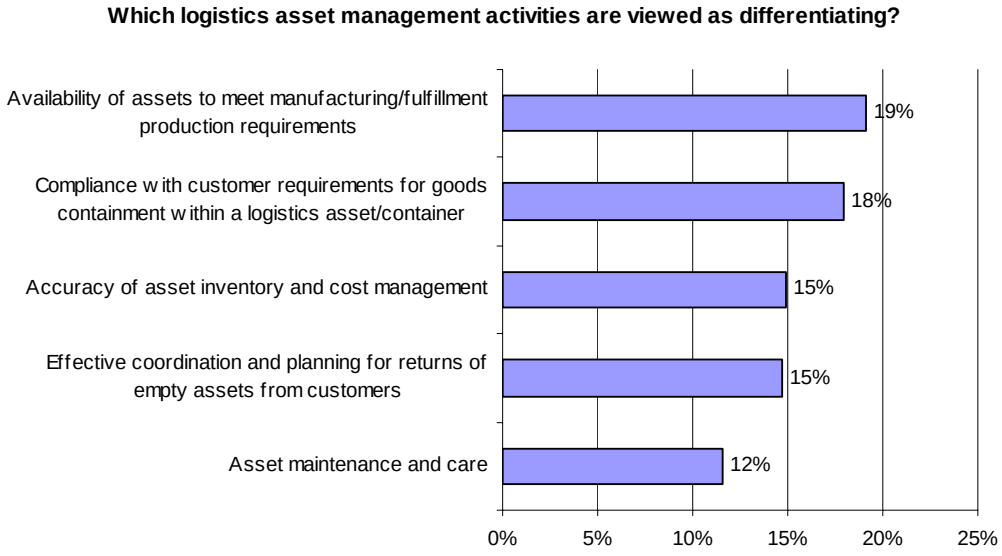
Survey results reveal that the following areas are virtually tied as the most important and differentiating factors of logistics asset management objectives (Figure 5):

- The availability of assets to support production and fulfillment operations
- Compliance with customer mandates

It is significant that the supporting activities of asset visibility, as well as disruption recognition and management, rate so low. This finding indicates that companies are hoarding "just-in-case" pools of assets rather than more cost-effectively managing the asset inventory through precise information. RFID-enabled asset management systems will allow the detection and monitoring of all assets providing the opportunity to eliminate these hoards and reduce the capital they consume.

All print and electronic rights are the property of Aberdeen Group © 2004.

Figure 5: Differentiating Logistics Asset Management Activities



Source: Aberdeen Group, June 2004

RFID Is Key to Many Improvement Areas

Going forward, RFID-enabled processes will be a key differentiator that sets the enterprise apart from its competition. Deploying RFID tags and technology systems that use RFID information will give companies precise visibility into logistics assets, knowledge of the status and condition of the logistics assets, and the ability to plan for and coordinate the movement of those assets to ensure availability in the right location at the right time. Without these capabilities, a company will not be able to provide differentiated customer service that leads to greater customer retention, increased revenue from additional opportunities with existing customers, and improved profitability.

RFID technology can assist in many additional areas of logistics asset management.. The use of RFID tags can improve velocity and visibility of inventory for customers, so that RFID becomes a value-added service for the customer. RFID technology can also prevent fulfillment mistakes and minimize stockouts. For instance, the tag on a bread tote can indicate the truck, route, and sequence to ensure the tote is placed in the right vehicle in the right sequence and is unloaded at the right delivery stop.

Pursuing the Right Differentiation Areas

To help companies understand where order fulfillment operations can add the most value and how to think about their investments, Aberdeen developed the Fulfillment Solutions Framework (Figure 6).

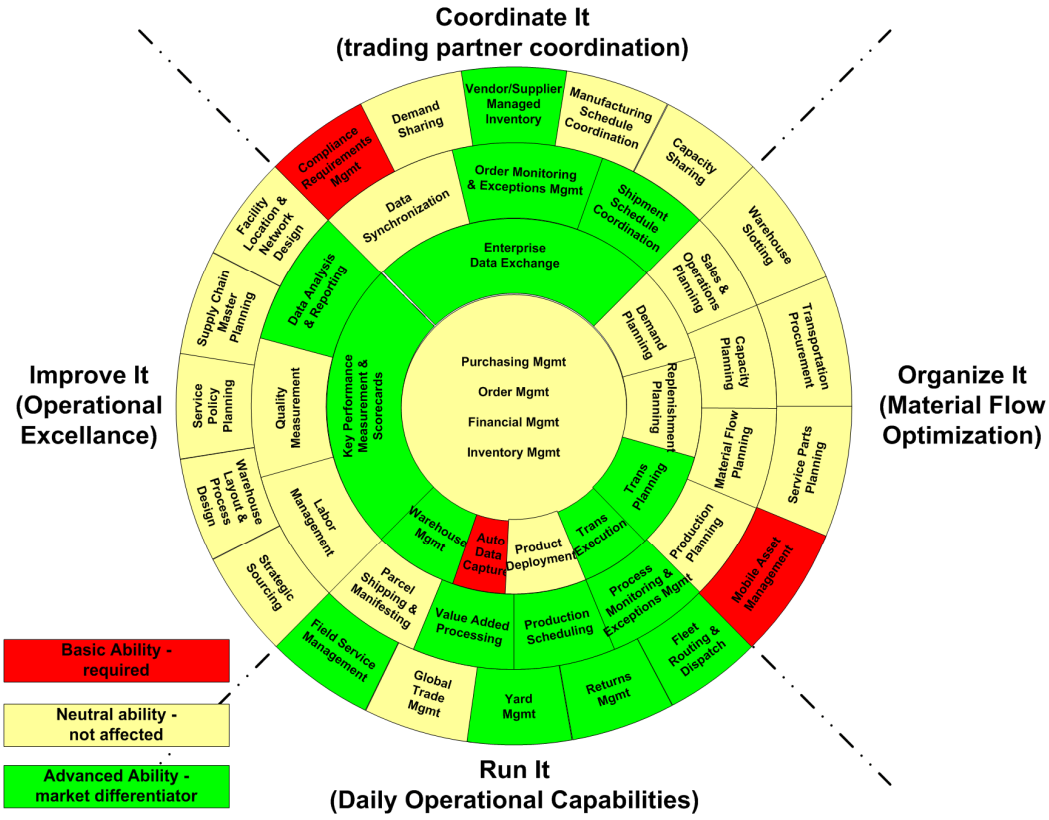
The framework is designed for executive users, and effective use depends on the executive's understanding of the company's intended direction, the requirements and performance metrics that order fulfillment operations need to meet to support that direction, and an honest evaluation of the current state of the company's logistics asset management

All print and electronic rights are the property of Aberdeen Group © 2004.

capabilities. With this foundation, the executive can use the framework to identify areas that are missing or underperforming in their current portfolio, understand the relative impact improvements in these areas can have, and then select areas in which to investigate business process or technology enhancements. The framework can also be used to identify which areas of the company will be impacted by a business process change or technology investment. For instance, adding RFID tags to bins used to shuttle parts between an OEM and the assembly line allows the part number, quantity, and supplier identification to travel with the bin and enabling the IT solutions that receive the bins at the assembly plant to process the RFID data to immediately give movement instructions to the forklift operator unloading the bin will improve efficiency and accuracy within the assembly plant. It could also enable a payment transaction for the supplier based on what has been unloaded from the delivery truck, in real-time, thus improving the delivery to cash cycle for the supplier.

Aberdeen's research uses this framework to explain the impact of RFID-enabled logistics asset management strategies and technologies. Specifically, the framework shows which functions deliver — when RFID-enabled logistics asset management strategies are applied — basic capability, market parity within the industry, or competitively differentiated performance.

Figure 6: Fulfillment Solutions Framework (RFID-Enabled Asset Management)



Source: Aberdeen Group, June 2004

All print and electronic rights are the property of Aberdeen Group © 2004.

The Fulfillment Solutions framework lays out the possible functional solutions into four areas of emphasis:

- Trading partner coordination (coordinate it) — the coordination of communications with the enterprise's supply chain trading partners (customers, manufacturers, regulatory agencies, etc.)
- Material flow optimization (organize it) — functions that help the enterprise examine, evaluate, and optimize the organization and its use of supply chain assets
- Daily operational capabilities (run it) — functional areas that most affect the daily execution and management of supply chain transactions
- Operational excellence (improve it) — Solutions and/or practices that are used to monitor, analyze, and improve the operational capabilities of the supply chain

The color coding of Figure 6 indicates the impact that RFID-enabled asset management provides to the enterprise. Red indicates an area that is basic to a logistics asset management solution implementation focused on meeting the baseline demands of the asset management operations. These functions represent the minimum capabilities to track and manage the availability of logistics assets. It includes RFID tagging with automatic data collection, customer compliance requirements management, and mobile asset tracking management functions.

Green indicates where RFID logistics asset management will create differentiating capabilities. These capabilities derive from functions that deliver greater success in a competitive world. Enterprises with these capabilities, as necessary for their industry and their business objectives, will have an integrated approach that will be more flexible and functionally rich. They will have implemented the solutions necessary to ensure the availability of their mobile logistics assets, and to ensure effective customer service and retention.

Yellow indicates a solution where RFID-enabled asset management has limited or no additional impact.

All print and electronic rights are the property of Aberdeen Group © 2004.

Chapter Three:
Implications and Analysis

Key Takeaways

- Despite the importance attributed to logistics asset management operations, only 6% of companies use a KPI program daily, and 42% have no KPI program at all.
- Companies expect to receive 50% to 100% improvement in value by investing in new IT systems.
- Existing solutions are largely balanced between custom and packaged solutions with a leaning toward packaged solutions going forward, especially in larger enterprises.

Key Performance Indicator (KPI) Programs Are Missing

Key performance indicators (KPIs) are important to understanding the true performance of an enterprise. An enterprise cannot improve what it does not understand, and it cannot understand what it does not measure. Survey results revealed a glaring omission of KPI programs: Fifty-eight percent do not use them at all, and only 6% of respondents use KPIs on a daily basis. Of these, 88% were capable of responding to disruptions or changes in demand for logistics assets to support production requirements (a top challenge mentioned earlier). Eighty-six percent had visibility of the assets, three fourths performed transportation planning for the return of empty assets, and three fourths updated inventory on a real-time basis when these returns were received, again tackling some of the more difficult tasks. Fifteen percent used third-party logistics providers to manage these mobile assets. All of these tasks are key contributors to the differentiation of logistics asset management.

In a logistics asset management setting, KPIs can be used to measure production or fulfillment downtime, and incidents due to unavailability of the asset, incorrectly loaded (either physical loading or the wrong part) containers, delivery performance to the customer, asset inventory accuracy, maintenance costs, flow of empties back to production, etc.

Ten percent of respondents use weekly (versus daily) KPI programs, but weekly programs produce dramatically lower results. Response to disruptions or changes in demand for logistics assets to support production requirements slipped from 88% to 36%, and transportation planning slipped from three fourths to less than a tenth. Visibility of assets fell to less than half, and the other functions mentioned experienced similar reductions.

The key point is that a program of regular performance measurement is a necessity if an enterprise wants to confirm whether expected results were achieved. A recent study executed by The Logistics Institute of the Georgia Institute of Technology produced some interesting results. First, they defined several sets of metrics to determine the quality and productivity performance aspects for the fulfillment operations that were included in the study. They then compared these results against the number of metrics that were included in a performance measurement program at the responding facilities. The results confirm the “conventional wisdom” that you cannot improve what you do not measure. The more measurements that were included in the program, the more likely that the facility was run effectively and efficiently. According to the study, a program that measured more than 11

All print and electronic rights are the property of Aberdeen Group © 2004.

items would deliver a 30% performance improvement over a program that measured only five items.

The Aberdeen survey participants indicated that they are aware of this shortcoming. Seventy-five percent of them are planning to make an investment in their continuous improvement program within the next 24 months, 59% within the next 12 months.

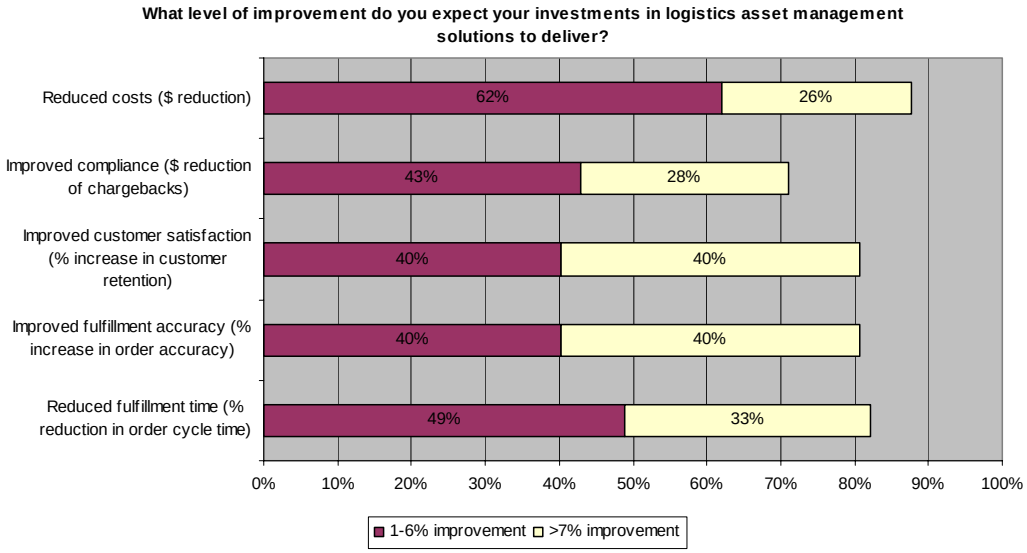
More Value Is Expected from Future Investments

Companies' expectations are escalating for the new technology investments they plan to make to improve their logistics asset management functions (Figure 7). Across the board, they are expecting from 50% to 100% more value from new technology systems.

For many companies, this jump in value is linked to the replacement of their manual processes with new ones that utilize RFID to improve many areas of asset management. The scope and breadth of these investments indicates a large opportunity for companies that provide RFID based tracking systems, systems that manage maintenance of assets, and transportation management systems that can be used to manage return of empty containers as well as the shipment of filled containers.

Although only 4% of today's assets are managed by a third-party solution provider or industry asset pool provider, we see these providers as poised to be a strong solution for 8% of companies that don't view logistics asset management as a domain expertise. (Industry asset pool providers manage and lease assets across multiple companies. CHEP pallets are a well-known example of pooled assets.) We also expect that when companies implement the KPI programs, more of them will discover that logistics asset management is not a core competency and will look externally for assistance.

Figure 7: Expected Value for Investments in Logistics Asset Management Functions



Source: Aberdeen Group, June 2004

All print and electronic rights are the property of Aberdeen Group © 2004.

RFID Adds Its Own Value

The application of RFID in an asset management scenario is not rigorously dependent on industry-wide standards. Since asset management tends to be a closed loop environment, the trading partners can agree on what the "standards" are that they will utilize. The greatest area for this flexibility is the data stored on the tag. For example, the truck, load sequence, and destination could all be added to the tag contents in a route delivery scenario. This would increase the accuracy and efficiency of the delivery process and help insure that the customer gets their delivery in a timely fashion. Sensors could be added to the tag that allows the recording of temperature and the detection of tampering. The tag could have GPS location and satellite communications capability allowing it to respond with its current location when polled remotely, thus radically improving visibility to the asset.

Additional Financial Implications

RFID-enabled logistics asset management capabilities allow companies to get a handle on their assets; this degree of control is not possible with manual systems. First, the tagging process will truly identify and track what assets currently exist. This will prove sobering when compared to what most companies have on their books. The implications of Sarbanes Oxley did not register high with our survey respondents. We think this is denial of a massive problem looming on the horizon for companies with hundreds, if not thousands, of these assets floating across their supply chains. The addition of RFID tags gives them the chance to set the record straight and to have the means to retain visibility of those assets and prevent future losses.

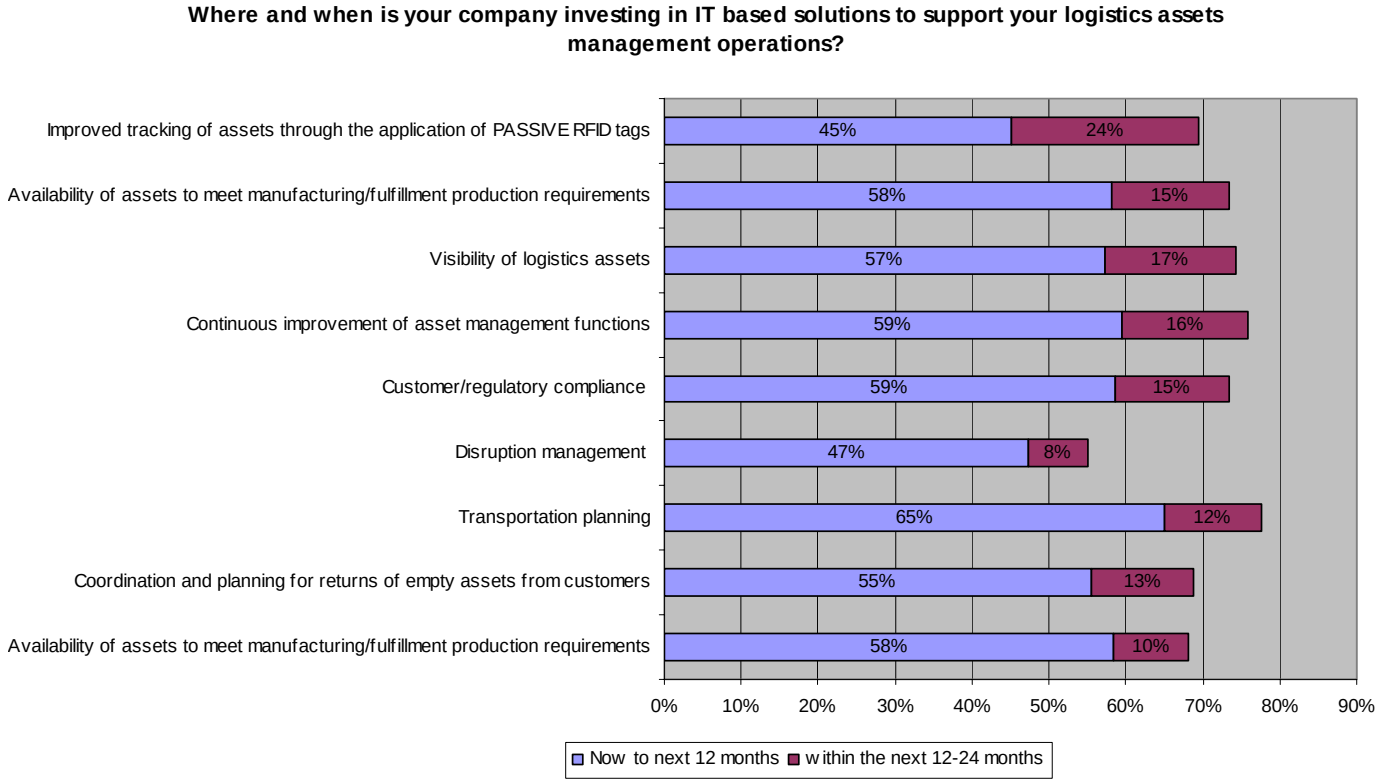
Additionally, when outsourcing or industry pooling are included in the companies logistics asset management strategy, opportunities exist to reduce the capital involved in these logistics assets. Although the visibility component of RFID-enabled logistics asset management allows the discovery and elimination of "just-in-case" pools of assets, outsourcing allows the enterprise to take the asset completely off the books.

The Call to Action

A surprisingly high percentage of respondents — ranging from 55% to 78%, depending on functional area — plan to invest within the next 24 months, and one-half to two-thirds plan to invest in the next year (Figure 8). These results indicate a broad opportunity for companies that can offer the systems to accelerate logistics asset management strategies (e.g., RFID-enabled management and visibility solutions)

All print and electronic rights are the property of Aberdeen Group © 2004.

Figure 8: Investment Plans



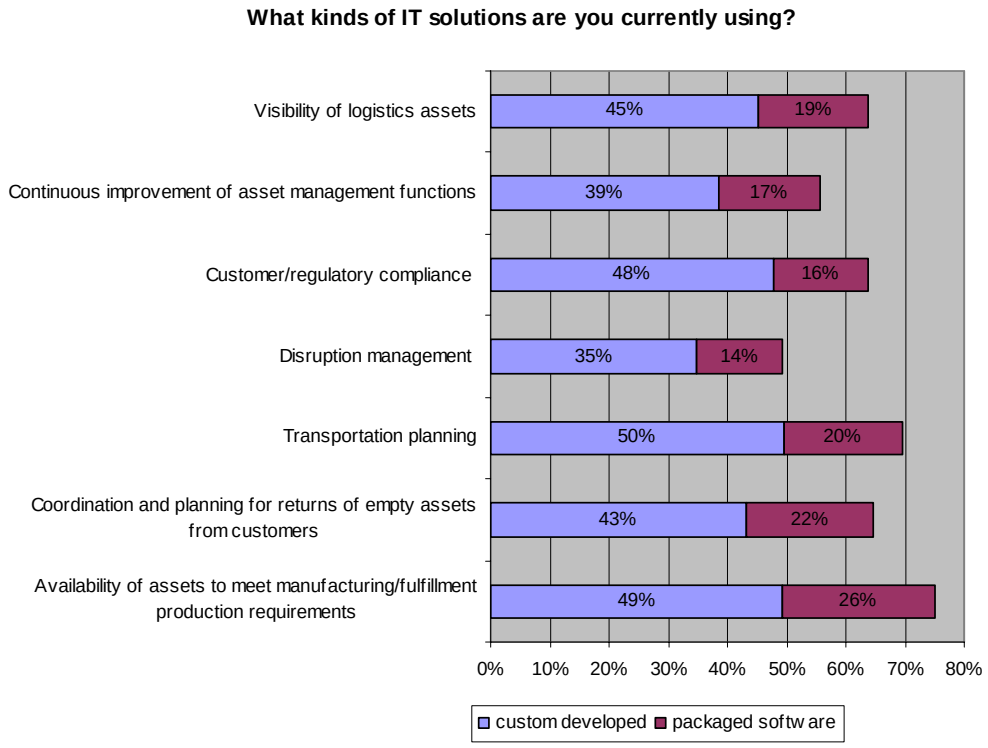
Source: Aberdeen Group, June 2004

Moving Beyond the Existing Portfolio

In examining the investment plans, it is important to understand what is currently in place. The first finding from Aberdeen's survey is that half of logistics asset management processes were totally manual, with no IT support. For those respondents who had IT solutions support, about half used custom-developed solutions (Figures 9 and 10). Across the board, at least half of these custom solutions were either Microsoft Excel or Access based.

All print and electronic rights are the property of Aberdeen Group © 2004.

Figure 9: Current IT Solutions



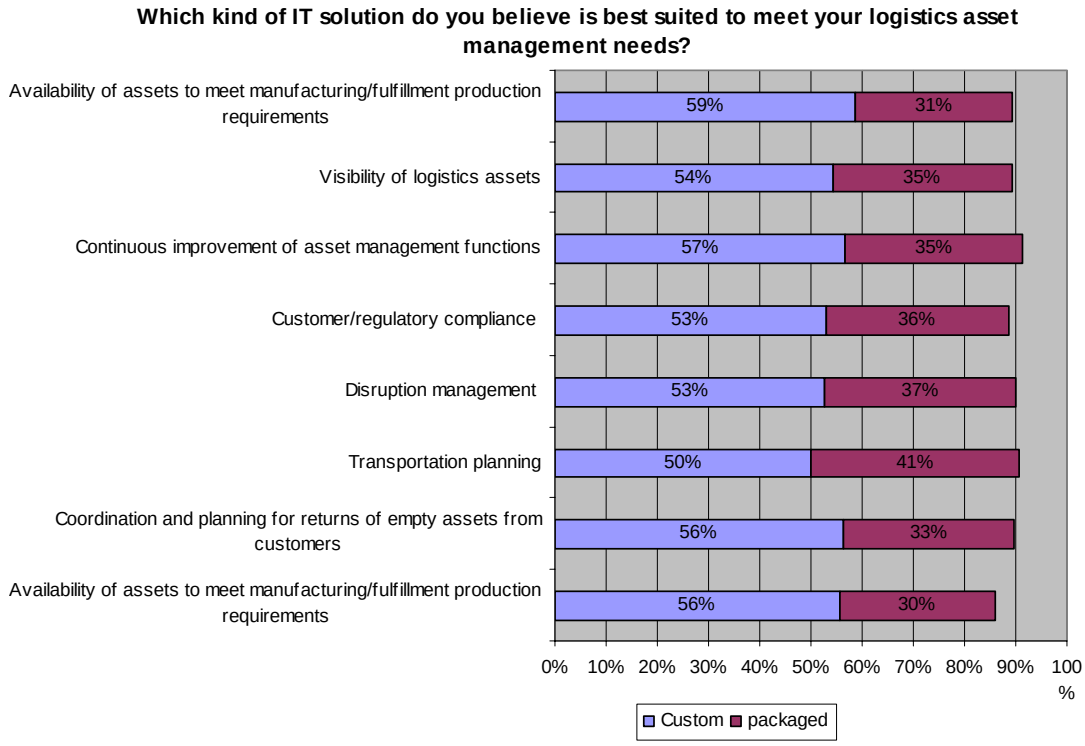
Source: Aberdeen Group, June 2004

This finding indicates that the current portfolio is composed of legacy systems that were made Y2K compliant and are only now being considered for upgrade. In other cases, the supporting systems were developed "on the cheap" in an ad hoc effort to make logistics asset management easier. The nature of the solution technology indicates that these programs were not a part of a master plan of IT development. The packaged applications against which they are competing for investment dollars have gained functional richness that make them more likely candidates as replacement systems.

As companies make new investments in technology, the balance between packaged solutions versus custom developed solutions is still skewed to custom efforts. Aberdeen believes this to be short-sighted. Most enterprises can add to their domain expertise by utilizing packaged solutions from vendors with a proven track record of managing their type of logistics assets. The software vendor has had the opportunity to build on the experiences of many installations in multiple asset management scenarios and often has embedded best practices into their functionality. Large enterprises were more likely than mid-sized companies to prefer a packaged solution (28% versus 15%).

All print and electronic rights are the property of Aberdeen Group © 2004.

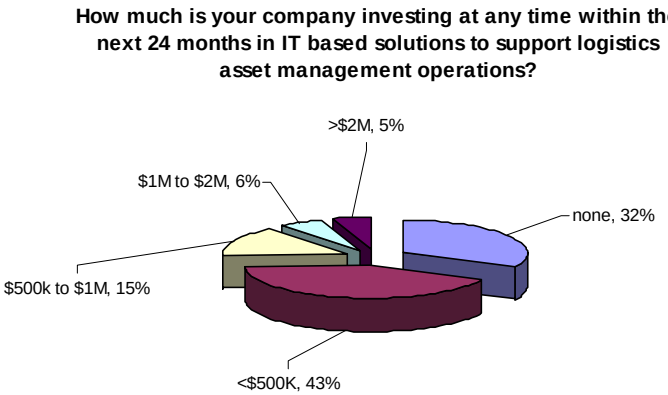
Figure 10: Best IT Platforms for Future Systems



Source: Aberdeen Group, June 2004

As indicated in Figure 11, companies' investments over the next 24 months will tend toward $1 million or less (58%).

Figure 11: Fulfillment Solutions Spending Plans



Source: Aberdeen Group, June 2004

All print and electronic rights are the property of Aberdeen Group © 2004.

Benchmarking Your Company

The key to creating more effective order fulfillment operations is understanding how a company stacks up against its peers. The Aberdeen Competitive Framework for Order Fulfillment enables companies to assess their competitive position and improvement opportunity (Table 1). To use the framework, find the description in each row that most closely matches what is prevalent in your organization.

- If that description is in the *industry average* column, then your company has an undifferentiated logistics asset management strategy in that particular area and does an adequate job of meeting internal and external customer requirements. However, you could achieve significant improvement in customer service, fulfillment speed and accuracy, and cost by adopting more-advanced processes and supporting technology.
- If that description is in the *laggard* column, your company's logistics asset management strategy is a liability and is causing you competitive disadvantage. Your asset availability and reaction times are slower than industry average, which will result in increased costs and disruptions, increasing customer dissatisfaction. You need to create an initiative to overhaul your asset management practices.
- If that description is in the *best in class* category, your logistics asset management practices differentiate your company from your competition and are enabling you to provide better service to your internal or external customers. However, unless the majority of your answers are in the *best in class* column, there is still significant room for improvement.

Table 1: The Logistics Asset Management Competitive Framework

	Laggards	Industry Average	Best in Class
Process	Standard processes for the management of logistics assets do not exist. All activities are ad hoc, crisis driven.	Standard processes exist and are used within individual departments on a regular basis.	Standard processes are shared with trading partners and their capabilities and needs are integrated within the standard
Organization	Fragmented management decisions. No coordination between departments or sites.	Basic coordination between departments on asset requirements, availability and returns processes.	Enterprise-wide coordination to include with trading partners.
Knowledge	No visibility into logistics assets with limited visibility of maintenance costs.	Visibility into spend on an asset basis within a specific department. Visibility of assets limited and focused at those items within the department's/site's immediate physical control.	Enterprise wide visibility of operating costs associated with logistics assets. Supply chain wide visibility of the physical location and condition of assets.

All print and electronic rights are the property of Aberdeen Group © 2004.

	Laggards	Industry Average	Best in Class
Technology	Everything is manual. At best, there is an out of date inventory of capital invested in logistics assets.	Management of logistics assets is assisted by existing solutions but is not a key function of those solutions.	Systems are integrated to manage the use of logistics assets. RFID is a key element in this program
Performance Metrics	No metrics are tracked.	Weekly KPIs are used. Average performance improvements are 2-3% reduction in fulfillment time and reduced operational costs of 2-3%.	Daily KPIs are used. Average performance improvements are >5% reduction in fulfillment time, reduced operational costs by >5%, and reduce asset losses by 50%.

Source: Aberdeen Group, June 2004

All print and electronic rights are the property of Aberdeen Group © 2004.

Chapter Four: Recommendations for Action

Key Takeaways

- Focus improvement plans on driving customer satisfaction by having assets where they are needed when they are needed and by complying with customer requirements
- Implement key performance improvement programs to guide the planning process and to measure progress
- Address the failure of existing systems to support logistics asset operations effectively, RFID tag all assets immediately and implement technology solutions that take advantage of RFID's capabilities
- Find leverage points with logistics service providers and use them

Breaking Down the Strategies

Focus on Customer Satisfaction

Enterprises must enhance their ability to deliver requested products in containers or logistics assets that best meet customer requirements for product production and presentation. This needs to be done in a way that insures timely delivery, effective returns management, and assures availability of logistics assets to meet manufacturing/fulfillment production requirements. Even though all these areas directly support customer service, customer satisfaction is also enhanced by the following:

- The assets are available when needed.
- They have the product properly stowed.
- The assets are maintained in good condition.
- RFID tags and systems are used to help track and identify the asset's contents.
- The returns operation is efficient.

All these elements are vital components of effective RFID-enabled logistics asset management, and they are also key components in a comprehensive customer satisfaction program.

Implement Daily KPI Programs

You can not improve what you do not measure and you can not plan without data. It is no longer cost effective, or even feasible, to have the customer-focused capabilities recommended above without having the means in place to assess your performance, determine corrective actions, and support continuous improvement programs.

Find Leverage Points

Use logistics service providers or industry asset pool providers to provide domain expertise and technical assistance in those areas where the enterprise is weak. These companies make their living doing logistics asset management in multiple industries. They have a greater breadth of experience than a company that operates within a single industry. Used

All print and electronic rights are the property of Aberdeen Group © 2004.

properly, logistics service providers can help an enterprise rapidly expand into new geographies. They can deliver services that might be new to enterprises, but have been a part of their experience for some time. Consequently, they can often do this more cost-effectively.

Use Packaged Solutions

Companies' existing processes and IT systems are clearly not sufficient to keep their asset management operations competitive in todays more cost-conscious and customer-service focused environment. Fifty percent of the existing processes are supported manually. No technology function had more than 19% satisfaction levels. In fact, the average satisfaction level was 11%. Such shortcomings must be addressed or the enterprise will lose competitive position.

Packaged solutions, like 3PLs, represent an opportunity for an enterprise to gain solutions proven in other industries or for other enterprises that are beyond their own experience. These solutions can be implemented immediately versus a custom solution that must be designed, tested and fixed before it is even implemented. Small and mid-sized companies need to follow the lead of the larger enterprises and use packaged solutions to meet their needs with less reliance on home-grown Excel and Access based solutions. This style of homegrown solution is not robust, can be easily "broken," and requires ongoing support to ensure data integrity and effective transaction execution.

Examples of solutions that could be consider have many capabilities that will enable enterprises to execute logistics asset management well. These packages can include asset positioning and repositioning support, asset move planning, asset maintenance and repair history, asset visibility across locations and across enterprises, and alerts for assets held excessively long by trading partners, etc.. Programs also exist where the capabilities mentioned are augmented with asset ownership, leasing and depreciation.

Custom solutions, especially those developed using MS Access or Excel, are best suited to experimentation and proof of concept situations. They can be developed quickly to prove a technique or process and then can be replaced before their fragility to business process changes becomes a serious concern.

Use RFID Extensively

RFID use in logistics asset management situations is the area where this relatively new technology has had its most robust testing and development, and the most-proven production use and ROI. The opportunity exists with multiple vendors to have solutions that capitalize on the ability of RFID to deliver the data with the goods. Systems exist to take this data and use it to drive visibility to assets (and the inventory inside the asset) as well as transaction execution and issuance of movement instructions. RFID can reduce asset losses, improve asset availability and decrease human labor requirements.

Packaged solutions exist that have RFID tightly integrated into their process and functions. Their offerings include RFID tags and readers and whatever middleware is necessary to deliver a fully RFID-enabled business application. Not only does RFID enhance the ability of these packages to do the functions stated above, new capabilities are also possible; e.g. asset GPS that pings an asset on a programmed schedule (weekly, daily, etc.) to identify where it is, the addition of sensors to detect and record temperature, tampering, shock, and so forth.

All print and electronic rights are the property of Aberdeen Group © 2004.

The PACE Framework for Order Fulfillment

The PACE framework is a structured method used by Aberdeen Group to represent the prioritized pressures, actions, capabilities, and enablers used in addressing particular business issues. A PACE shows how companies can take critical business issues (the pressures), create effective responses (the actions) and execute on them through process changes (the capabilities), and technology changes (the enablers). Companies can use the framework to identify their key industry pressures and understand best practices in mobilizing to address them.

As Table 2 shows, the key strategies for logistics asset management are to have efficient operations that drive up customer satisfaction while driving down costs. These terms are defined as follows:

- *Pressures* — external forces that impact an organization's market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive)
- *Actions* — the strategic approaches that an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product/service strategy, target markets, financial strategy, go-to-market, and sales strategy)
- *Capabilities* — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products/services, ecosystem partners, financing)
- *Enablers* — the key functionality of technology solutions required to support the organization's enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cleansing, and management)

Table 2: Prioritized PACE

Priorities	Prioritized Pressures	Prioritized Actions	Prioritized Capabilities	Prioritized Enablers
1	Customer driven logistics asset requirements/ mandates	Maintain business relationship with mandating customers	Implement structured processes focused on satisfying customer mandates	Implement IT solutions to replace manual processes and to support new ones
2	Asset availability is erratic	Extend technology investments to control assets	Implement business processes that focus on asset availability	Apply RFID tags to all mobile logistics assets, implement solutions to manage visibility and availability

All print and electronic rights are the property of Aberdeen Group © 2004.

Priorities	Prioritized Pressures	Prioritized Actions	Prioritized Capabilities	Prioritized Enablers
3	Costs of asset management are too high and growing	Extend technology investments to control asset costs	Implement KPI program to track performance	Extend use of RFID-enabled solutions to manage inventory and maintenance, and transportation costs (to include returns) of assets.

Source: Aberdeen Group, May 2004

All print and electronic rights are the property of Aberdeen Group © 2004.

Featured Sponsors

Deloitte

Deloitte, one of the nation's leading professional services firms, provides audit, tax, consulting, and financial advisory services through nearly 30,000 people in more than 80 U.S. cities. Known as an employer of choice for innovative human resources programs, the firm is dedicated to helping its clients and its people excel. "Deloitte" refers to the associated partnerships of Deloitte & Touche USA LLP (Deloitte & Touche LLP and Deloitte Consulting LLP) and subsidiaries. Deloitte is the U.S. member firm of Deloitte Touche Tohmatsu. For more information, please visit Deloitte's Web site at www.deloitte.com/us.

TrenStar Inc.

TrenStar Inc. was formed three years ago to offer a unique "pay-per-use" combination of technology and services to manage mobile assets, like equipment and reusable containers that carry products through the supply chain. TrenStar's solution is designed to eliminate a significant capital expense for the enterprise and a process that is resource intensive so that clients are investing in line with the benefit stream.

TrenStar's three-part asset management, logistics services, and supply chain technology solution, integrating RFID and container tracking software, is offered to qualified clients for no up-front cost. This solution is intended to benefit multiple companies in an asset-intensive industry participating in TrenStar's distinctive asset pooling operations.

On the Net: www.trenstar.com

All print and electronic rights are the property of Aberdeen Group © 2004.

WhereNet

WhereNet designs, builds, and markets wireless location and communication solutions for managing mobile resources in vertical markets, such as manufacturing, warehousing/distribution, automotive, and health care. Typically found in high-value asset management applications, the company's products provide for total asset visibility through real-time wireless tracking. With knowledge of the exact location of an asset, a company can lower its cost structure and generate improved response times, facilitating better decision making and enhanced customer service. The company has offices throughout the United States and an office in Europe. Current customers include several major Fortune 500 companies, including Ford Motor Company.

All print and electronic rights are the property of Aberdeen Group © 2004.

Sponsor Directory

Deloitte

Deloitte
Global Office
1633 Broadway
New York, New York 10019-6754
(214) 840-7866
http://www.deloitte.com

TrenStar Inc.

TrenStar, Inc.
5613 DTC Parkway, Suite 1100
Greenwood Village, CO 80111
(303) 220-1133
www.trenstar.com

WhereNet

WhereNet
2858 De La Cruz Blvd.
Santa Clara, CA 95050
(800) 490-2261
(408) 845-8582
sales@wherenet.com
www.wherenet.com

All print and electronic rights are the property of Aberdeen Group © 2004.

Author Profile

Thomas K. Ryan,
Vice President, Value Chain Research
Aberdeen Group, Inc.

Tom Ryan is an information technology and logistics professional with more than 25 years of experience in warehouse and transportation operations and systems, enterprise integration technology architecture, and supply chain collaboration enablement through the application of technology. His experiences also include warehouse management, manufacturing maintenance management, fleet maintenance management, manufacturing information systems, material handling engineering design, and supply chain execution, distribution, and logistics systems.

Previously, he was the director of an integration services consulting group and the practice leader for a Supply Chain and Enterprise Integration (SCEI) consulting practice. The SCEI practice focused on assisting enterprises with the difficult task of implementing the technologies necessary to support collaborative supply chain business models. He has also been the Director of Technology for a third-party logistics company where he implemented in a green field environment the enabling technologies for the collaborative supply chain business model. Tom was a Research Director at the Gartner Group, an information technology research advisory and analysis firm. In this capacity, he had specific responsibilities in the Integrated Logistics Strategies service for warehouse management and transportation management applications and technologies. Prior to joining Gartner Group, Tom was a distribution consultant, project/account manager and applications designer for several warehouse management systems providers. He has also managed warehouse operations for a fortune 50 CPG manufacturer. His first employment after graduation from the United States Military Academy was as a commissioned officer in the United States Army serving in airborne and armored units in the US and in Europe.

All print and electronic rights are the property of Aberdeen Group © 2004.

About Aberdeen Group

Aberdeen*Group*

Aberdeen Group's Fulfillment Practice

Companies' inbound and outbound processes are sliding more out of sync — with larger, slower inbound shipments and smaller, more frequent outbound shipments. Add to this a new level of compliance issues — government regulatory mandates like traceability and security plus retailer mandates like RFID and data synchronization — and you have a unique situation that supply chain managers must tackle.

- How do you redesign and operate a **reliable, cost-efficient supply chain** while the carpet of rules keeps shifting underneath?
- How do you achieve **continuous cost-improvement** while maintaining product and distribution quality and employee morale?
- How do you manage **new inventory and security risks** as you build a global portfolio of trading partners?
- How do you create a set of **logistics capabilities** that will drive value for the enterprise and become a competitive differentiator?

Aberdeen looks at fulfillment as a portfolio of potential solutions in the four focus areas of fulfillment operations:

- Trading partner coordination
- Material flow optimization
- Daily operational capabilities
- Operational excellence

Aberdeen's research will look at the problems that enterprises face, the commonality of solutions between enterprises, and the measure of their business impact. Our research will include actionable advice that executives at enterprises can follow to realize at least the same gains experienced by their counterparts.

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. Although some reports or portions of reports may be underwritten by corporate sponsors, Aberdeen's research findings are never influenced by any of these sponsors.

All print and electronic rights are the property of Aberdeen Group © 2004.

Appendix A:
Research Methodology

Between April and June 2004, Aberdeen Group and *Logistics Management* magazine examined logistics asset management procedures, experiences, and intentions of more than 233 enterprises in multiple consumer oriented industries.

Responding supply chain, logistics, and operations executives completed an online survey that included questions designed to determine the following:

- Overall cost of reusable assets
- Methods used for management of reusable assets and reduce losses
- Methods used to improve customer service

The study aimed to identify emerging best practices for logistics asset management and provide a framework by which readers could assess their own logistics asset capabilities.

Responding enterprises included the following:

- ***Job title/function*** — The research sample included respondents with the following job titles: procurement, supply chain, logistics executive or manager (36%); manufacturing/operations executive or manager (28%); IT manager (9%); customer service (4%), and other corporate management positions (23%).
- ***Industry*** — The research sample included respondents predominantly from manufacturing industries. Transportation and logistics businesses represented 18% of the sample, followed closely by distribution and retail/wholes companies, which accounted for 9% each of respondents.
- ***Company size*** — About 31% of respondents were from large enterprises (annual revenues above US$1 billion); 21% were from midsize enterprises (annual revenues between $1 billion and $250 million); and 49% of respondents were from small businesses (annual revenues of $250 million or less).

Solution providers recognized as sponsors of this report were solicited after the fact and had no substantive influence on the direction of the *RFID-Enabled Logistics Asset Management Benchmark Report*. Their sponsorship has made it possible for Aberdeen Group and *Logistics Management Magazine* to make these findings available to readers at no charge.

All print and electronic rights are the property of Aberdeen Group © 2004.

Appendix B:
Related Aberdeen Research and Tools

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

- *RFID in the Consumer Industries* (March 2004)
- *Next Generation Order Fulfillment (*July 2004)
- *The Quiet Revolution in Supplier Management Benchmark Report (*June 2004)

Information on these and any other Aberdeen publications can be found at www.supplychainaccess.com or by e-mail at sca@aberdeen.com.

All print and electronic rights are the property of Aberdeen Group © 2004.

Aberdeen Group, Inc.

Founded in 1988, Aberdeen Group is the trusted advisor to the Global 5000 for value chain strategies and technology advice. Through its continued benchmarking and analysis of value chain practices, Aberdeen offers a unique mix of research, tools, and services to help G5000 executives assess their value chain performance, develop improvement strategies, and select value chain solution partners.

This research study is the result of research performed by Aberdeen Group.

Aberdeen Group performs specific projects for a select group of domestic and international clients. Each project requires a combination of strategic advice and pragmatic, experience-based action plans. Assignments range from corporate and product positioning and organizational planning to in-depth market segment research. Aberdeen consults on mergers and acquisitions, corporate positioning and investor relations, and transaction-processing benchmarks; in addition, it offers special expertise in software and midrange computer markets.

In carrying out assignments, Aberdeen uses a proprietary, comprehensive, analytical framework providing fresh insight into the complex future of computing and communications, both from technological and market-dynamics perspectives. Aberdeen also offers retainer-fee programs to a group of continuing clients.

Aberdeen principals and staff are recognized industry figures with hundreds of years of combined high-tech industry, research, and financial community experience among them. They are quoted extensively in industry trade and business publications. Each staff member is a frequent conference and seminar speaker.

In addition to client-related research and consulting, Aberdeen publishes several periodicals, Aberdeen Viewpoints, and Profiles, which summarize its analysis and research findings.

To provide us with your feedback on this research, please go to www.aberdeen.com/feedback.

The information contained in this publication has been obtained from sources Aberdeen believes to be reliable, but is not guaranteed by Aberdeen. Aberdeen publications reflect the analyst's judgment at the time and are subject to change without notice.

The trademarks and registered trademarks of the corporations mentioned in this publication are the property of their respective holders.

Warning: This publication is protected by United States copyright law and international treaties. Unless otherwise noted, the entire contents of this publication are copyrighted by Aberdeen Group, Inc. and may not be reproduced, stored in a retrieval system, or transmitted in any form or by any means without prior written consent. Unauthorized reproduction or distribution of this publication, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent necessary to protect the rights of the publisher.

© 2004 Aberdeen Group, Inc., Boston, Massachusetts

THIS DOCUMENT IS FOR ELECTRONIC DELIVERY ONLY

The following acts are strictly prohibited:

- **Reproduction for Sale**
- **Posting on a Web Site**
- **Transmittal via the Internet**

Copyright © 2004 Aberdeen Group, Inc. Boston, Massachusetts

Terms and Conditions

Upon receipt of this electronic report, it is understood that the user will and must fully comply with the terms of purchase as stipulated in the Purchase Agreement signed by the user or by an authorized representative of the user's organization.

This publication is protected by United States copyright laws and international treaties. Unless otherwise noted in the Purchase Agreement, the entire contents of this publication are copyrighted by Aberdeen Group, Inc., and may not be reproduced, stored in another retrieval system, posted on a Web site, or transmitted in any form or by any means without prior written consent of the publisher. Unauthorized reproduction or distribution of this publication, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent necessary to protect the rights of the publisher.

The trademarks and registered trademarks of the corporations mentioned in this publication are the property of their respective holders.

All information contained in this report is current as of publication date. Information contained in this publication has been obtained from sources Aberdeen believes to be reliable, but is not warranted by the publisher. Opinions reflect judgment at the time of publication and are subject to change without notice.

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.