

RFID-Enabled Logistics Asset Management: Improving Capital Utilization, Availability, and Total Operational Costs

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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 over one tenth of revenue. Moreover, theft, damage and misplacement often erode asset productivity. For instance, a quarter of companies report losing over 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 charge backs, 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 & 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 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.

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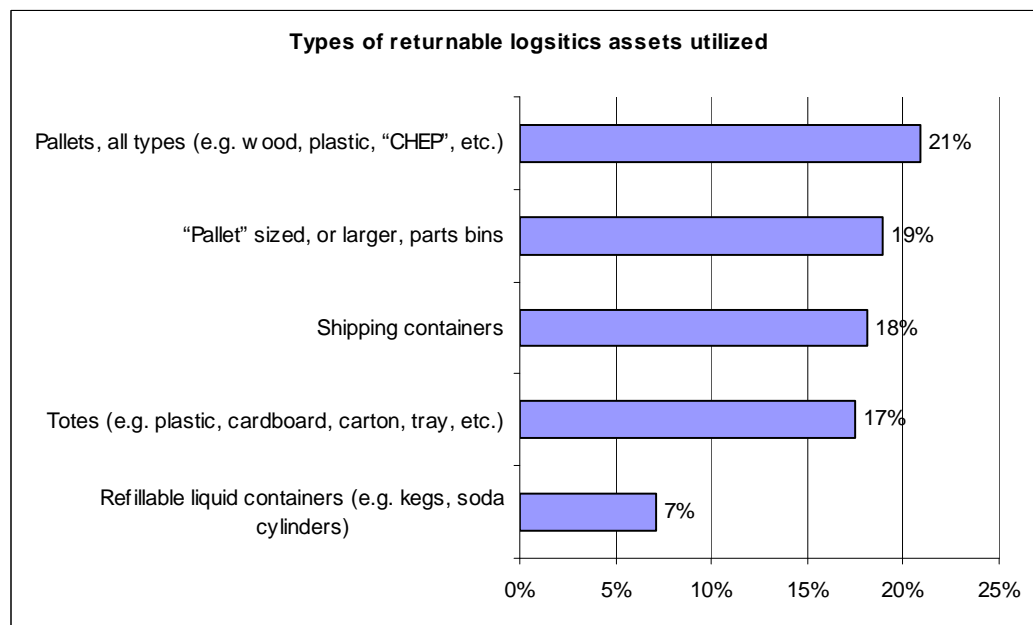
Issues at Hand

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. As shown in Figure 1, logistics asset management includes many types of assets.

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, while almost one fifth of respondents spend over 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.

Figure 1: Mobile Logistics Assets



Source: TKR Consulting Associates, August 2005

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 over 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 (over \$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, while 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.

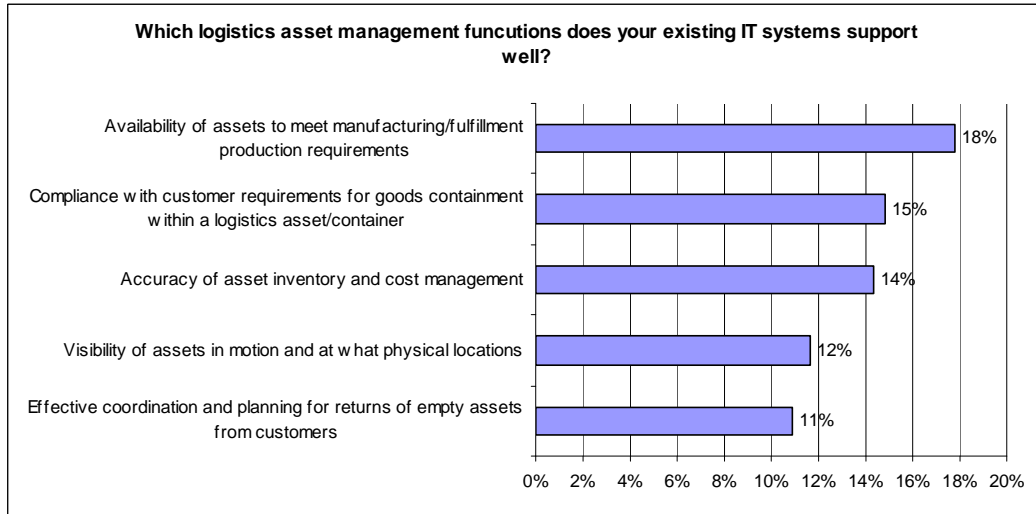
Logistics Asset Management is Differentiating

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 materials 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. 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 3, this is causing a majority of companies to make plans to invest in technology system extensions or replacements over the next 12-24 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



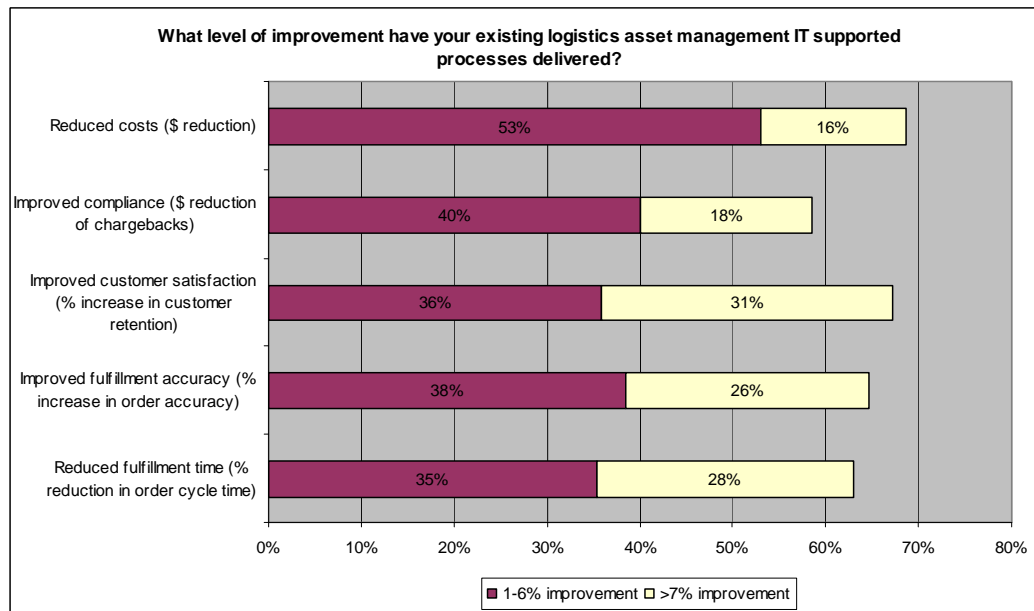
Source: TKR Consulting Associates, August 2005

Key Business Value Findings

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

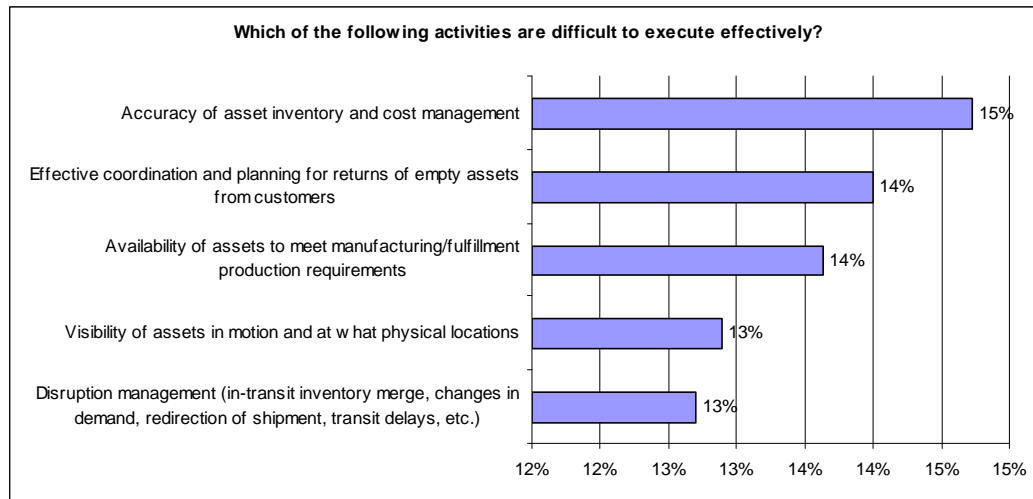


Source: TKR Consulting Associates, August 2005

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: TKR Consulting Associates, August 2005

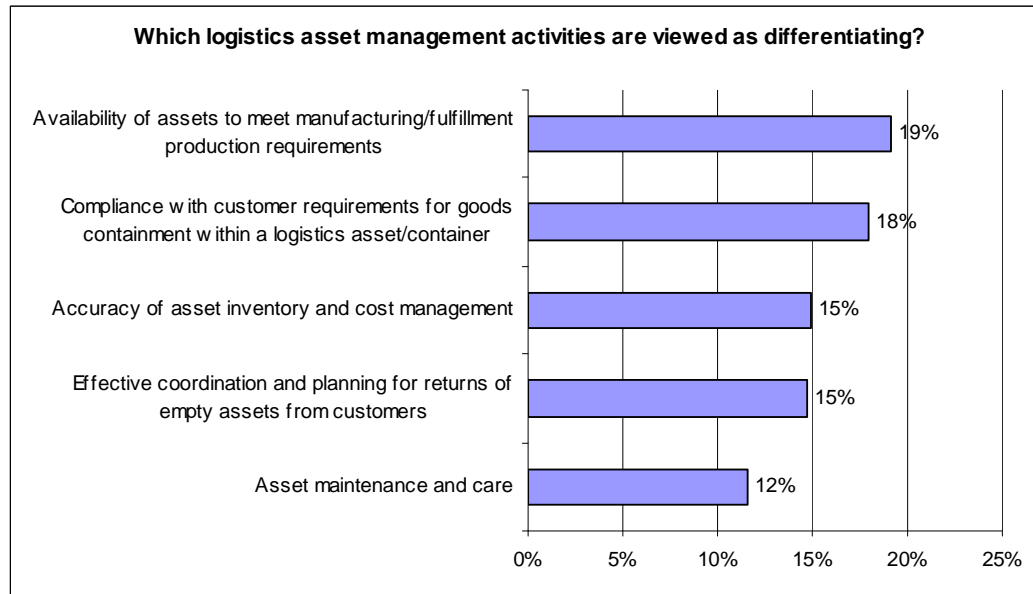
Availability of Assets and Compliance are Differentiating

Survey results reveal that these areas are virtually tied as the most important and differentiating factors of logistics asset management objectives:

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

It is significant that the supporting activities of asset visibility, and disruption recognition and management rate so low. This 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.

Figure 5: Differentiating Logistics Asset Management Activities



Source: TKR Consulting Associates, August 2005

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

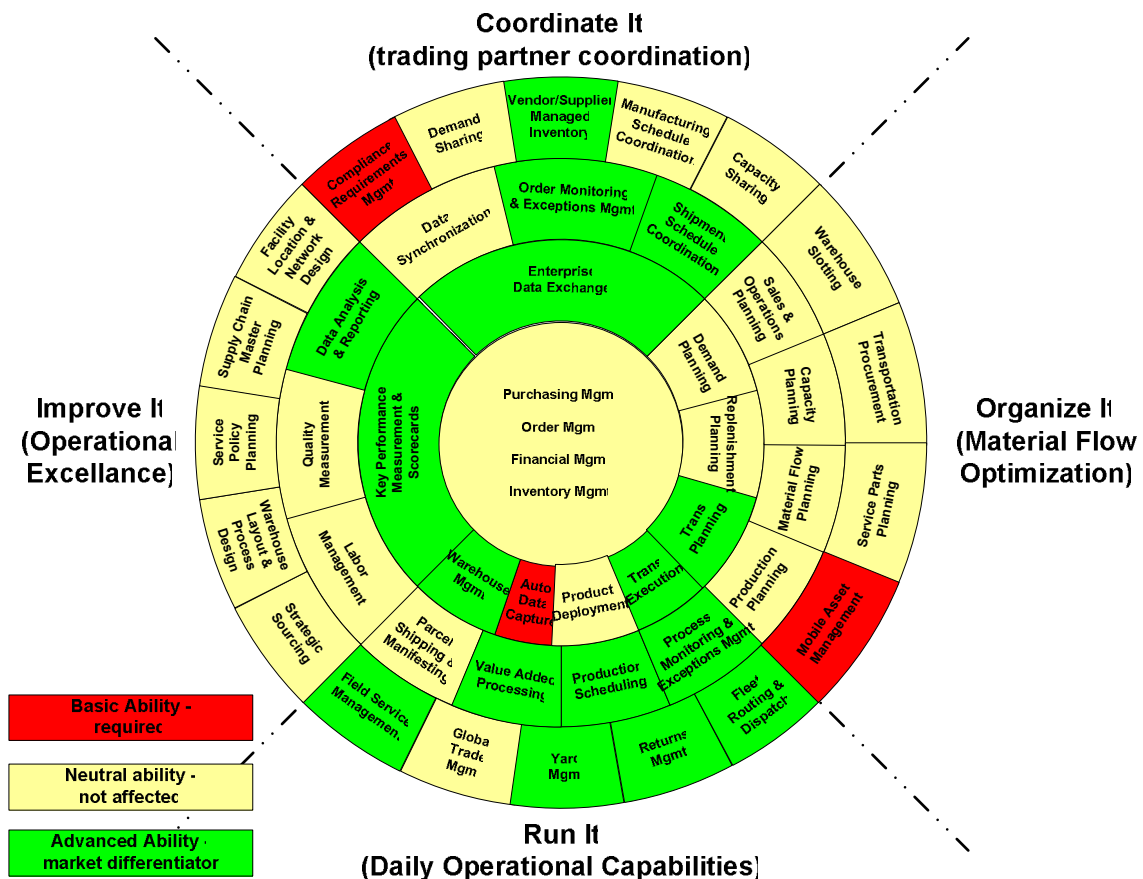
To help companies understand where order fulfillment operations can add the most value and how to think about their investments, Aberdeen developed the Fulfillment Solutions Framework (Figure 6).

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 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: TKR Consulting Associates, August 2005

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

RFID-Enabled Logistics Asset Management

- 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.

Implications & Analysis

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 (vs. 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 can not 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 items would deliver a 30% performance improvement over a program that measured only 5 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.

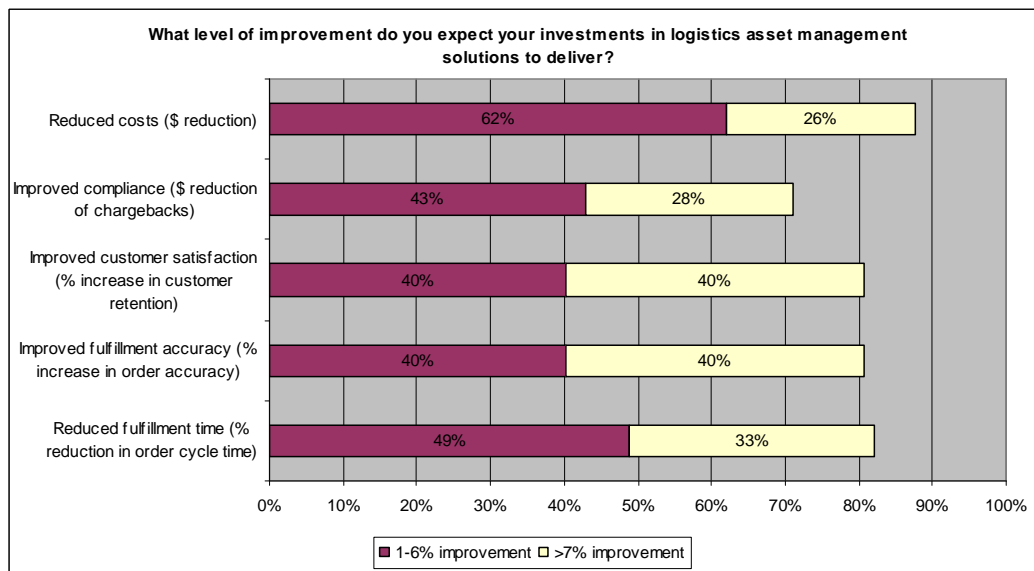
More Value is Expected from Future Investments

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.

While 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: TKR Consulting Associates, August 2005

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

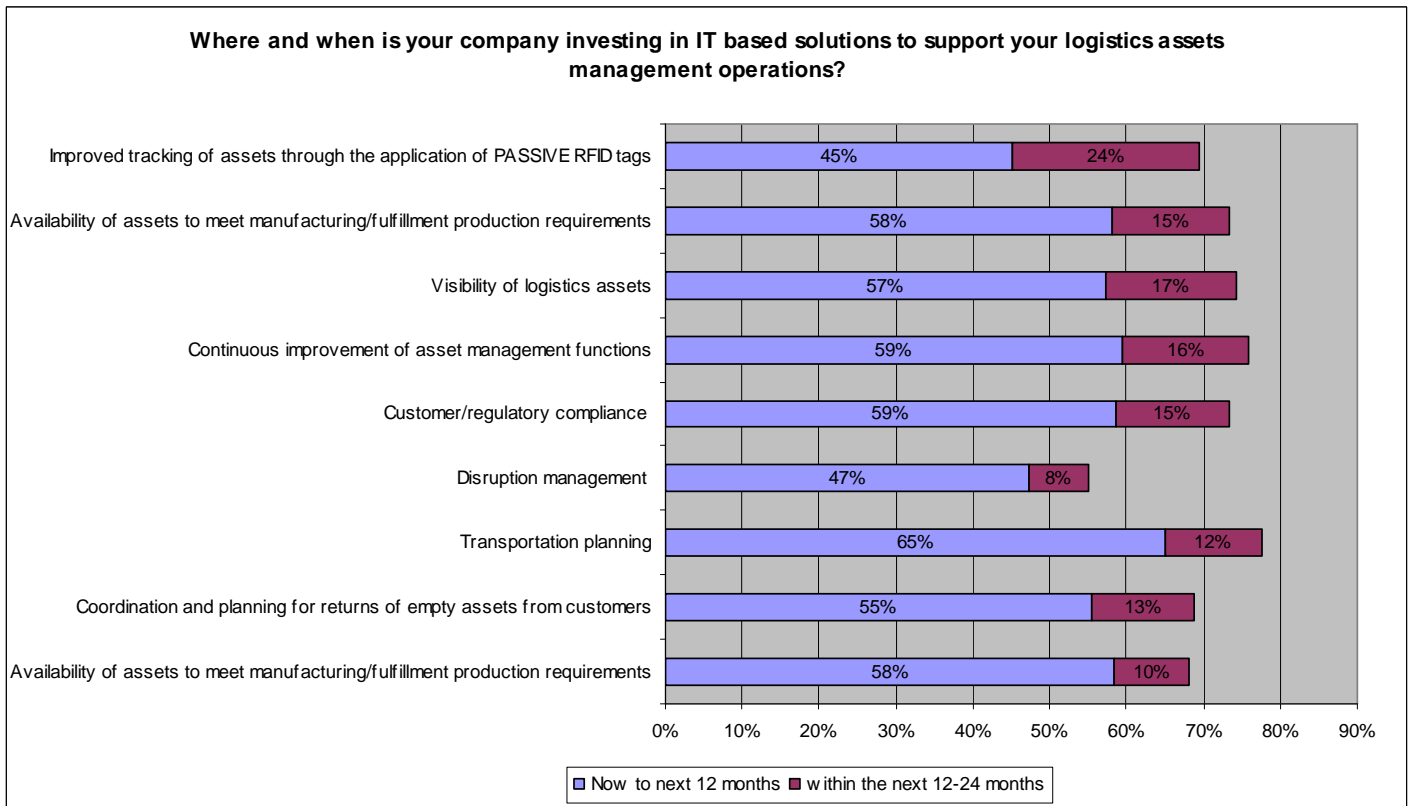
RFID enabled logistics asset management capabilities allow companies to get a handle on their assets that is not possible with manual systems. First, the tagging process will truly identify and track what assets currently exist. This will prove sobering when compared to what most companies have on their 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. While 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 say they plan to invest in the next year. 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)

Figure 8: Investment Plans

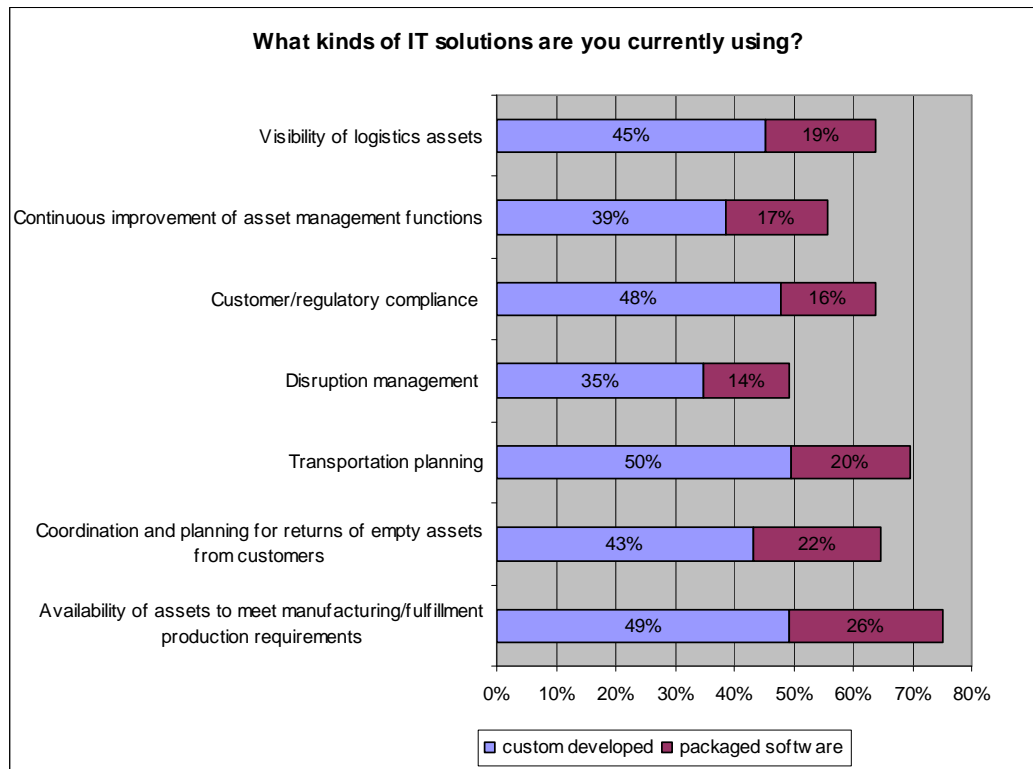


Source: TKR Consulting Associates, August 2005

Moving beyond the existing portfolio

In examining the investment plans, it is important to understand what is currently in place. The first learning is that half of logistics asset management processes were totally manual, with no IT support. For those respondents that had IT solutions support, about half used custom developed solutions. Across the board, at least half of these custom solutions were either Microsoft Excel or Access based.

Figure 9: Current IT Solutions

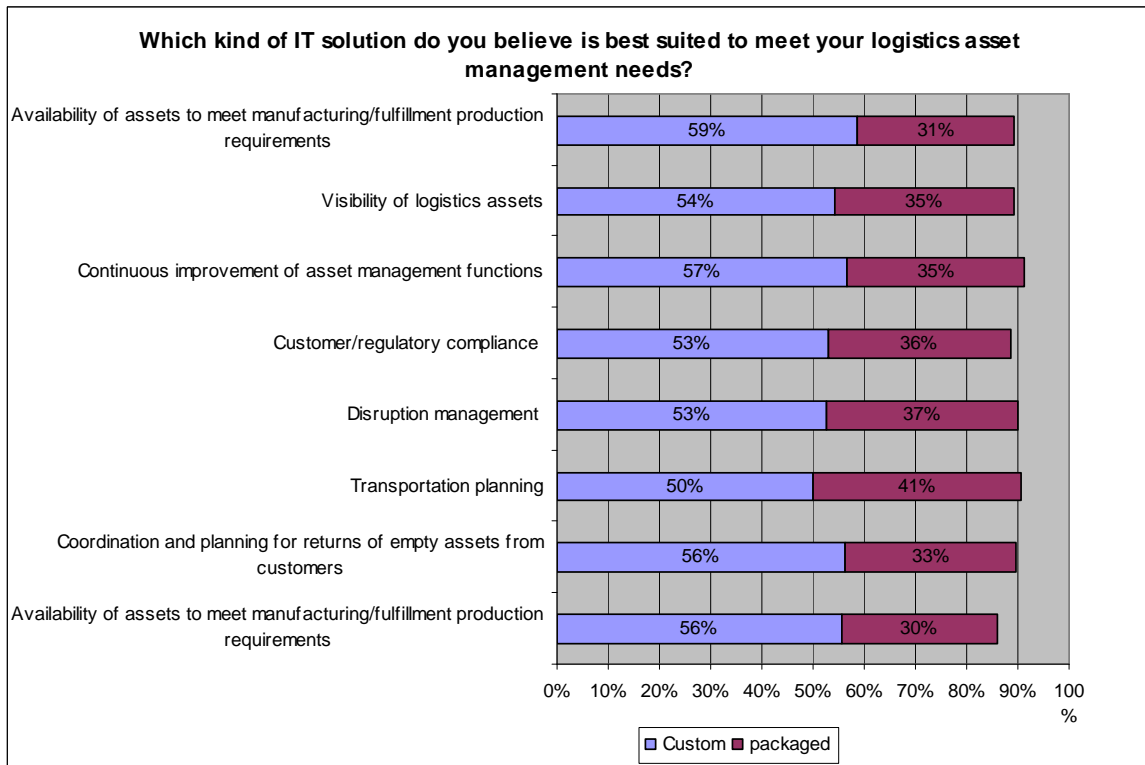


Source: TKR Consulting Associates, August 2005

This 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 vs. 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% vs. 15%).

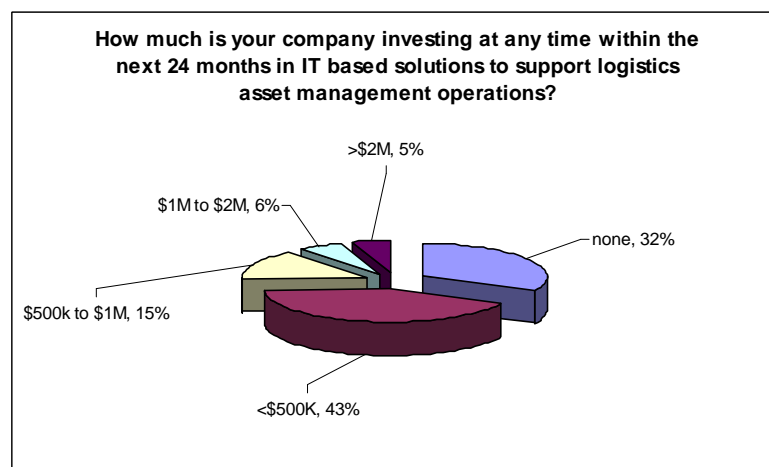
Figure 10: Best IT Platforms for Future Systems



Source: TKR Consulting Associates, August 2005

Investments over the next 24 months will tend towards \$1M or less (58%).

Figure 11: Fulfillment Solutions Spending Plans



Source: TKR Consulting Associates, August 2005

Recommendations for Action

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 a 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 properly, logistics service providers can help an enterprise rapidly expand into new geographies. They can deliver services that, while they might be new to the enterprise 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 today's 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 home grown solution is not robust, can be easily "broken", and requires on-going support to insure 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, etc..

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).

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