Extending Warehouse Management Beyond the Four Walls

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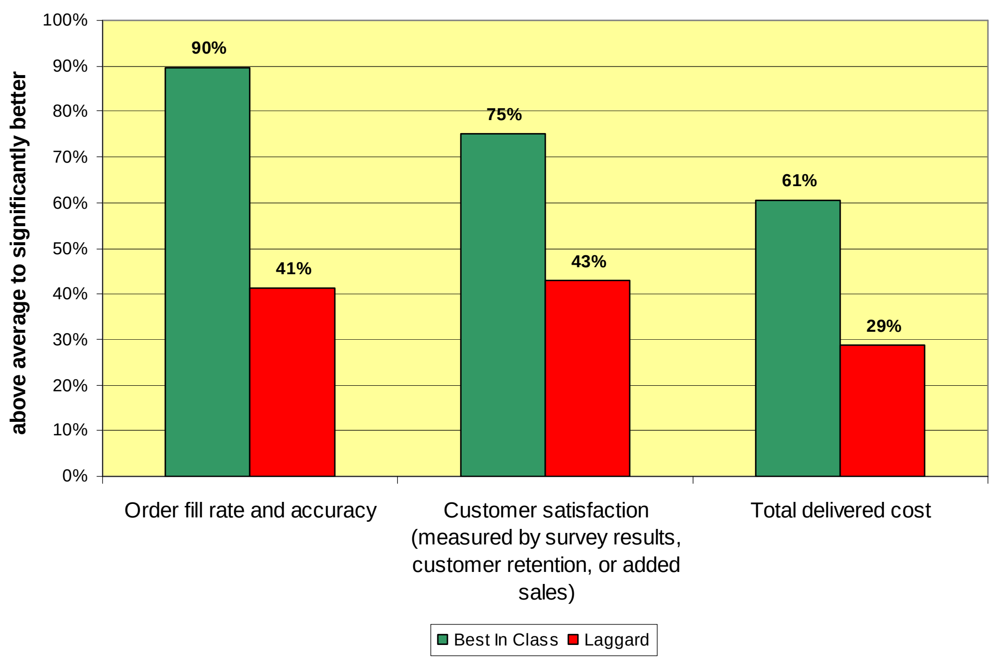
Executive Summary

Distribution processes are being transformed by new wireless-enabled technologies such as RFID location technology and other lower-cost wireless network options such as cellular and wifi. Logistics managers now can afford to extend their business process control beyond the warehouse walls to improve asset productivity and delivery precision. Leading supply chain managers are rethinking how to integrate inbound vehicles, dock activity, and yard management into traditional transportation and warehousing processes. They are looking at new ways to control product movements and improve velocity in drop yards, satellite facilities, and even their suppliers' warehouses.

Key Business Value Findings

When warehouse operations are extended beyond the four walls with the goal of delivering cost effective customer satisfaction, the business results are significant. Best-in-class companies enjoy a 50% advantage over laggards in four key areas; order fill rate and accuracy, inventory accuracy, warehouse flow through, and compliance to company internal standards. They enjoy a 20-25% advantage on customer service and satisfaction measures. The figure below compares some of these results against the total delivered cost advantage currently enjoyed by best-in-class companies.

Business Results vs. Customer Centric Focus When Compared to Industry Average Results



Source: TKR Consulting Associates, August 2005

Implications & Analysis

To improve customer retention through cost-effective customer satisfaction, 30% or more of companies are planning for significant process and technology changes over the next 24 months. The majority of these changes are customer centric (e.g., value-added services, implementation of standard processes across the enterprise, and strong compliance support), including those necessary to insure cost-effective delivery (e.g., yard management, on-line dock scheduling, and support of cross docks).

Recommendations for Action

In addition to the best-in-class actions, companies should also evaluate their processes to ensure they effectively accomplish the following:

- Insure that KPI and continuous improvement programs are in place to measure progress and help manage operations
- Insure that warehousing and transportation processes are in sync with each other; extend this synchronization to include centralized and de-centralized operations
- Synchronize transportation management and warehouse management processes to insure compliance with customer delivery instructions. If customers don't get what they want, when they want it, nothing else matters.
- Companies with complex yard and dock operations should implement yard management controls to provide visibility to inventory in the yard and to enable effective dock management

Table of Contents

Executive Summary 1
Key Business Value Findings 1
Implications & Analysis 1
Recommendations for Action 2
Issues at Hand 4
The Pressures for Expanding Warehouse Operations Beyond the Four Walls 4
Laggards Focus on Different Pressures 5
The Game has Changed 6
Key Business Value Findings 7
Strategic Actions for Extending Warehouse Operations 8
Overcoming the Barriers to Extending Warehouse Operations 9
Challenges by Type of Company 10
How Does Extending the Warehouse Processes Provide Advantage? 10
Pursuing the Right Differentiation Areas 11
Implications & Analysis 13
Process and Organization 13
Focusing on Customer-Centric Processes 13
Maintaining Internal Process Focus to Insure Cost-Effective Customer Service 13
Best-in-Class Companies Are Complacent in Maintaining Their Lead 14
Daily KPI Programs Are Needed 15
Recommendations for Action 16
Laggard Steps to Success 16
Industry Norm Steps to Success 16
Best-in-Class Next Steps 17
Appendix A: Research Methodology 18

Issues at Hand

In the past, effective execution of traditional warehousing functions provided competitive differentiation and was a key to customer satisfaction and retention. Today, customer demands for compliance to their requirements and value-added services have raised the minimum standard. Improving capabilities within the four walls of the warehouse will no longer provide competitive differentiation – now, impeccable execution of basic warehouse operations is the baseline necessary to compete in the marketplace. Customers continue to place more stringent logistics requirements on their suppliers and they expect product to be delivered faster and with better order quality. Many suppliers have taken this challenge seriously and have focused on delivering these improvements cost effectively. In fact, 52% of survey respondents said that their delivery customer service is better or significantly better than industry average, and 38% said that they have total delivered costs that are lower or significantly lower than industry average.

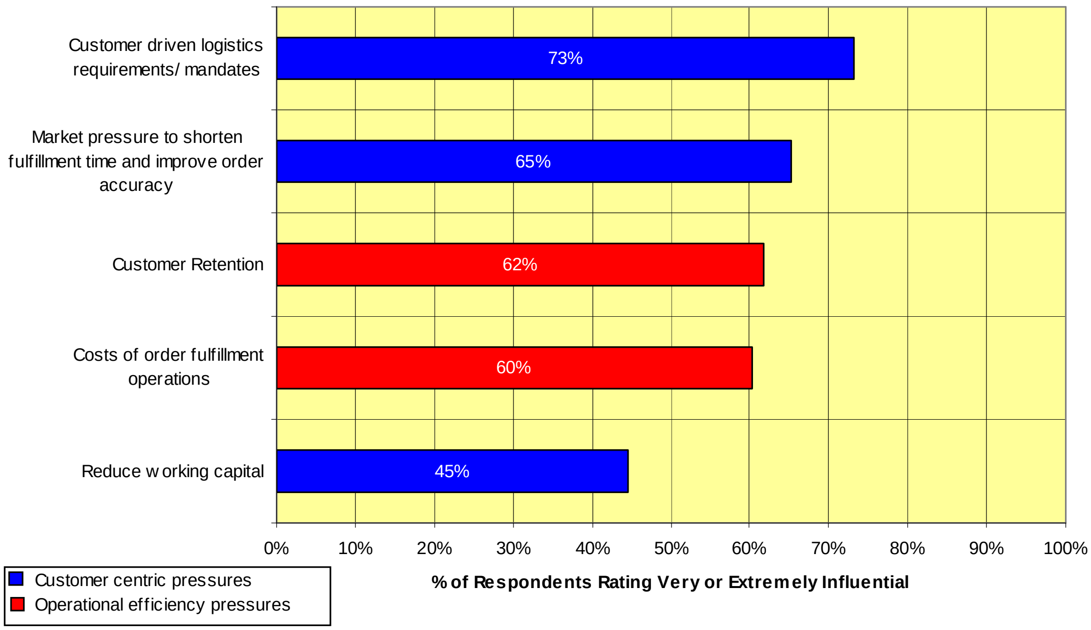
Focusing on an operational effectiveness focus without a similar emphasis on customer retention will no longer get the job done:

- Additional initiatives in many industries, like RFID compliance, direct store delivery, and a move to smaller, more frequent orders are placing added burdens on companies' warehousing and fulfillment operations.
- Delivering customer orders in a shorter period of time with increased order fulfillment accuracy can add significant cost to warehouse operations.
- The need to reduce working capital requirements, especially in smaller companies, demands a more efficient use of inventory to meet customer demands.

The Pressures for Expanding Warehouse Operations Beyond the Four Walls

Improving the cost and effectiveness of warehouse operations was the primary goal of operations management in the early 2000s. These goals were expanded to include a greater emphasis on basic compliance for order labels and shipment documentation. Now companies must cope with additional pressures: logistics requirements and mandates, pressures to further shorten fulfillment time and improve order accuracy, and the need to retain an increasingly less loyal customer (Figure 1).

Figure 1. Top Pressures for Extending Warehouse Processes



Source: TKR Consulting Associates, August 2005

The top two pressures for extending warehouse operations are customer related. Any fulfillment or warehouse operation that does not focus on these issues will cost its company money in one form or another. If customers don't get what they want, the way the want, when they want it, customers will move to more reliable and flexible suppliers. Even if these failures don't send customers running, margin reductions from retail chargebacks and invoice deductions caused by non-compliant labels or RFID tags, non-compliant documentation, failure to meet delivery windows, improper packaging, or incomplete or inaccurate orders will create serious margin challenges.

These increased demands cannot be met by throwing more inventory at the problem or by hiring a small army to execute compliance requirements. Tactics of this sort will also only work to erode existing margins. Companies must meet customer demands cost effectively or those customers are not worth having.

The majority of survey respondents see their existing basic warehousing (receive, store, pick, pack, and ship), compliance (labels and documents), and value added services (kitting and packaging) as satisfactory or better to meet the current pressures. However, they cited yard management and the associated visibility into inbound or in-yard inventory, moving RFID usage beyond the expensive, minimal slap-and-ship operations required for compliance, and improving dock/warehouse throughput as necessary areas for investment and improvement to meet the new demands.

Laggards Focus on Different Pressures

Both best-in-class and companies at the industry norm level are more sensitive to customer pressures than companies whose processes lag behind. We believe this is because the leaders are aware of where their costs are coming from and laggards are still trying to figure it out.

- Fifteen percent more best-in-class companies see meeting customer-driven requirements as their top priority compared to laggards.
- A similar gap exists when we examine shortened fulfillment cycles.
- Laggards have limited ability to measure their effectives in any area other than costs. Best-in-class companies have more granulated performance measurements around customer satisfaction and retention (e.g. order fill rate and accuracy, customer satisfaction, on-time deliveries, and compliance to customer mandates).

The Game has Changed

The new customer-centric reality requires warehouse and fulfillment executives to think differently about meeting customer expectations and improving customer retention, extending and improving the cost effectiveness of warehouse and fulfillment operations, and implementing appropriate measurements and incentives for warehouse performance.

Existing processes and technology used *within* the four walls of a facility delivered significant capability and success at meeting past customer requirements, but the new demands require better coordination with functions *outside* the four walls and the expansion of traditional warehouse operations into new areas. Some of this can be managed with new manual processes, especially in smaller companies with fewer transactions, but for larger, high-volume operations, manual processes will not deliver the consistency and effectiveness necessary to achieve cost effectiveness.

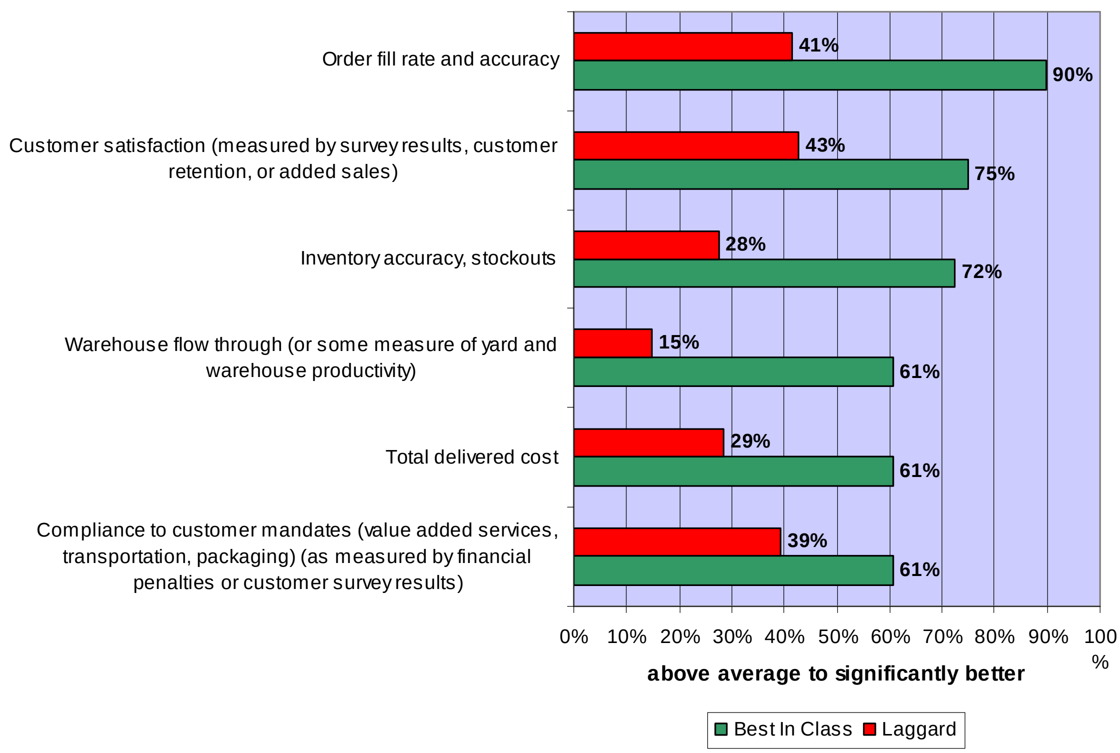
Although much can be accomplished through better manual processes, the growing relationship complexity and increased process velocity of most businesses require deployment of supporting technology to synchronize activities and provide actionable data on status, cost, and other information. Transportation technology not only must perform classic order consolidation, carrier/mode assignment, tendering, and freight settlement activities but also is increasingly expected to be a key information sharing and activity synchronization platform for the company and its trading partners.

Key Business Value Findings

Long considered a commodity function, warehouse operations have now proven their ability to deliver customer service, enable customer retention, and contribute to bottom line results. Best-in-class companies that focused on customer-centric functions first were more than twice as likely to perform better or significantly better than the industry average.

A deeper examination of the results indicates that regardless of size, best-in-class companies enjoyed similar performance advantages versus the market average (Figure 2).

Figure 2: Company Performance vs. Market Average Results



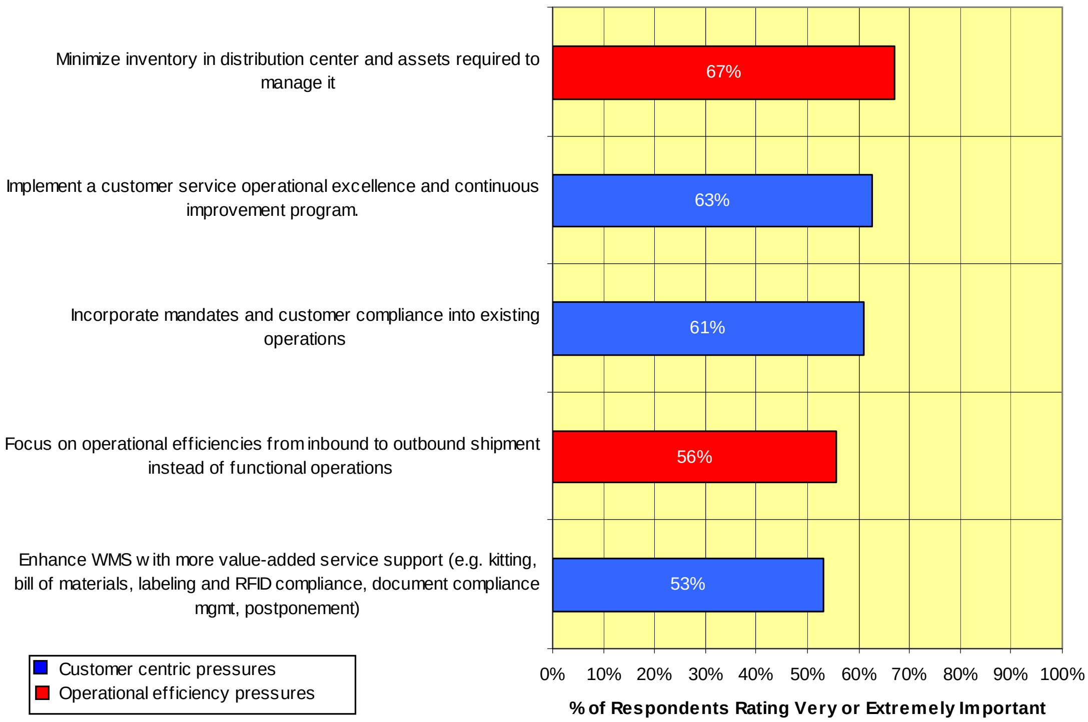
Source: TKR Consulting Associates, August 2005

More than twice as many best-in-class companies delivered more-accurate and complete orders to their customers when compared to the market average. These results are attributable to compliance to an *internal* enterprise standard rather than any *external* standard. Best-in-class companies are four times more likely than laggards to be in compliance with corporate standards. This focus allows these enterprises to count on a consistent quality of result that makes their customers happy. It allows them to measure performance consistently across the board, examine differences in results from one plant to another, and understand those differences. This consistency in approach also allows them to apply the best practices from their best performing operation to their other operations and achieve similar, high-quality results.

Strategic Actions for Extending Warehouse Operations

Figure 3 shows the actions companies feel have been most important in improving their warehousing performance. While industry norm and best-in-class companies have similar attitudes relative to the value of strategic actions, laggards have been placing much less importance on customer centricity, which is a key reason for their poorer performance.

Figure 3. Importance of Actions in Improving Warehouse Performance



Source: TKR Consulting Associates, August 2005

Companies focused on customer-centric issues are 50% more likely to perform better than the industry average in customer service:

- Best-in-class firms rate continuous improvement programs that insure continuing customer service excellence as of top performance, while laggards rate this third in their priority list.
- For best-in-class firms, meeting customer mandates is their second priority, while for laggards it is fifth in importance.
- Industry norm companies are more focused on inventory and asset costs than either the best-in-class or laggard companies. Normally, laggards are more concerned than the industry average firms. This indicates that industry average firms have not come to full realization of the importance of being customer centric.

Based on these data points, it is easy to understand why the companies focused on customer-centric issues achieved better results.

Overcoming the Barriers to Extending Warehouse Operations

Companies can use Table 1 to identify whether there are additional ways to respond to some of the challenges they are facing to extend warehouse operations and improve performance. For instance, one company was able to reduce the number of orders shipped with product shortages by implementing a yard management system. This system gave them visibility into the contents of each trailer in their large drop yard, identified which trailers had product they needed in the warehouse to fill orders, and then helped direct those trailers to the correct dock doors to facilitate efficient and timely unloading.

Companies' perceived challenges and responses also differ by their size and maturity level.

Table 1: Top Challenges and Responses to Improving Extended Warehouse Processes

Challenges to Improvement	% Selected	Responses to Challenges
1. Financial justification for integrating warehouse operations with other distribution processes	61%	1. Implement KPI programs where metrics assess costs and efficiencies and customer service
2. Extended functions and warehouse operations are a mix of centralized and decentralized operations	56%	2. Synchronize centralized operations with decentralized.
3Lack of understanding of best practices for extended warehouse management	50%	3. Revise procedures to maximize capabilities of existing systems in support of operations, train staff on new procedures
4. Lack the IT resources and bandwidth to improve warehouse systems and associated wireless networks	48%	4. Utilize best of breed solution providers or system integrators to extend internal resources skills and bandwidth
5. Primary extended functions are stand alone operations separate from main warehouse operations (transportation management, yard management, value added operations, compliance management)	40%	5. Integrate supporting technologies (e.g. online dock scheduling, yard management, visibility, event alarming, and disruption management solution) at a local facility level.
6. KPI program is fragmented and based on manual data collection	36%	6. Insure systems support KPI programs via automatic data collection

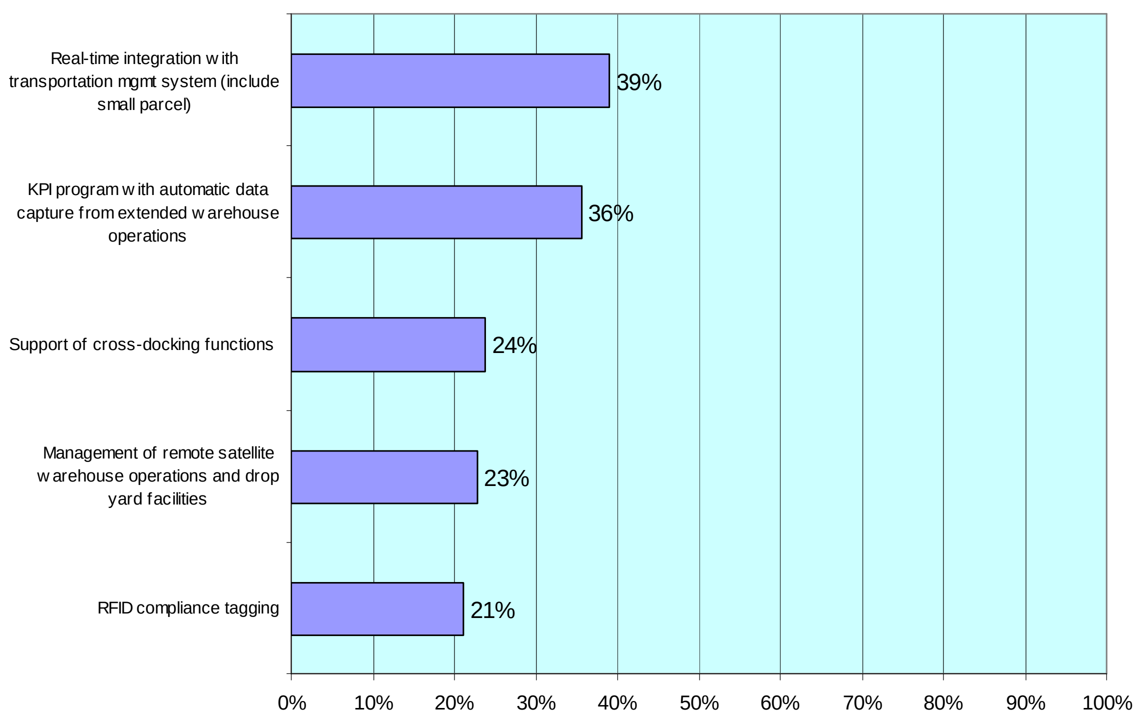
Challenges by Type of Company

- Best-in-class companies have a more balanced set of priorities – we only saw a 15%-19% range in their top-to-bottom list of challenges. They indicate that their existing computer systems are doing a reasonably good job of supporting them. Their investment plans in these areas are quite modest. Even though they have opened up a significant gap between themselves and the laggards, their limited investment plans focused at their current challenges is too casual and opportunity exists for industry average and laggard firms to erase the advantage these firms currently enjoy.
- Capital crunches are felt most acutely by small companies and laggards of all sizes. These firms are most concerned about the financial justification for new initiatives. They also expressed a similar difficulty in prioritizing process changes and having the skills in place to effectively execute the changes

How Does Extending the Warehouse Processes Provide Advantage?

Although survey respondents recognize the importance of the extended functions to delivering customer satisfaction, they have a hard time understanding the services that will give them competitive advantage. Their top three picks for differentiated warehouse functions are basic warehouse operations inside the four walls of the warehouse, value-added services support (e.g., bills of material, light assembly, packaging, simple kits, and display building), and compliance labeling and documentation (includes barcodes, UCC labels and BOLs). This is faulty thinking. These items were the leading differentiating factors several years ago, but they are considered baseline competencies today. Figure 4 shows the respondents' view of what is differentiating when we remove those baseline items.

Figure 4. Differentiating Extended Warehouse Functions



Source: TKR Consulting Associates, August 2005

Pursuing the Right Differentiation Areas

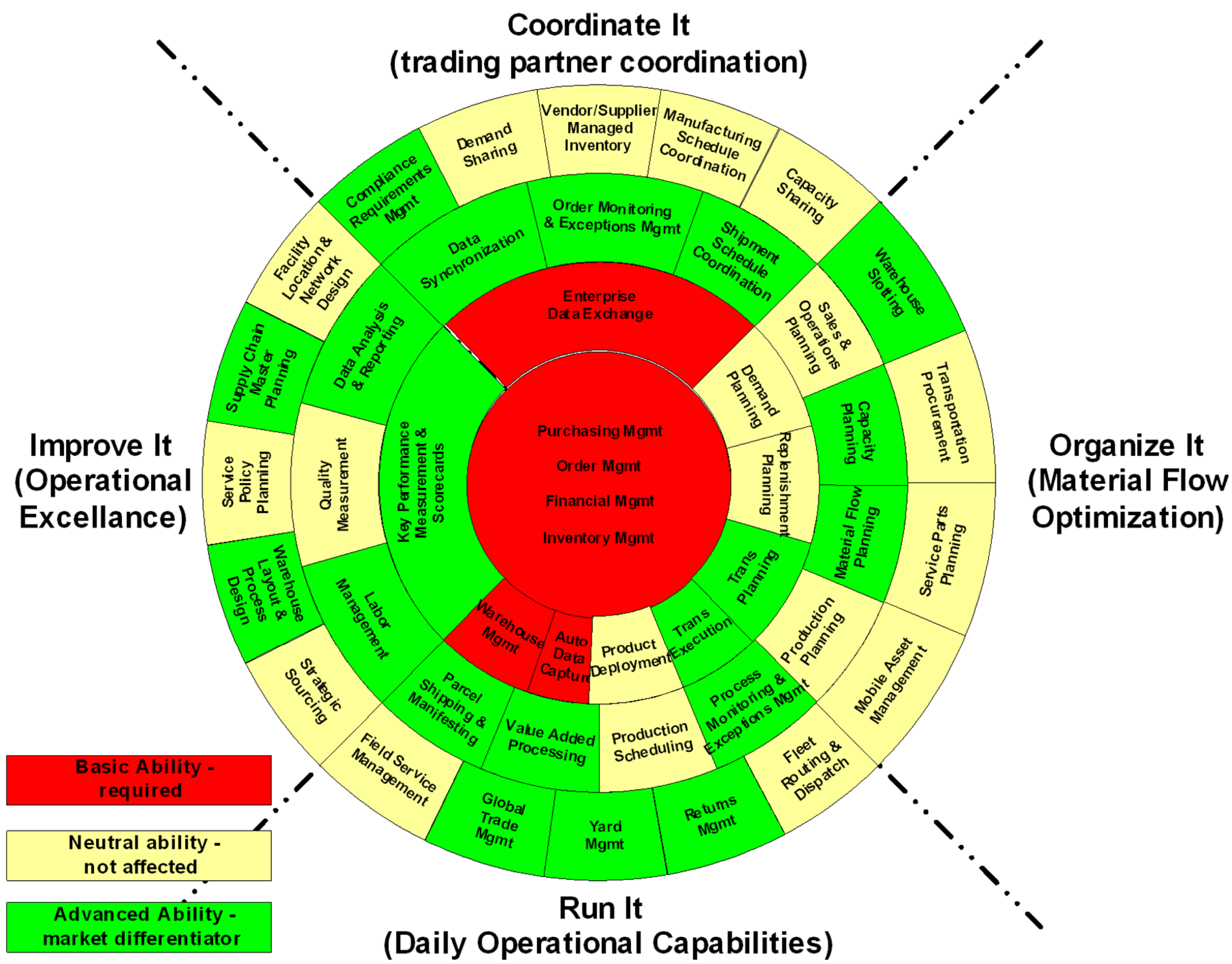
To help companies understand where extended warehouse operations can add the most value and how to think about their investments, Aberdeen developed the Fulfillment Solutions Framework (Figure 5).

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 extended warehouse operations need to meet to support that direction, and an honest evaluation of the current state of the company's extended warehouse 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 yard management and on-line dock scheduling can help insure that inventory that is in the yard is made available to fill orders and that dock throughput is increased, with the associated reduction in demurrage or wait time for trucks. Additionally, integration of the Warehouse Management System (WMS) and the enterprise's Transportation Management System (TMS) can help insure that the picking and shipping operations are synchronized with the shipment plan developed in the TMS. This helps insure on-time delivery of orders, significantly contributing to customer satisfaction.

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

Figure 5: Fulfillment Solutions Framework (Extended Warehouse Operations)



Source: TKR Consulting Associates, August 2005

Implications & Analysis

Process and Organization

More than 30% of survey respondents are planning process changes in five areas to positively impact extended warehouse processes. These changes are predominantly customer centric and include areas like RFID compliance, on-line dock scheduling, and compliance labeling and documentation. Areas being enhanced are complementary to inward-directed processes, where the companies feel they are already well positioned, including basic warehouse operations, basic value added services, and management of remote facilities.

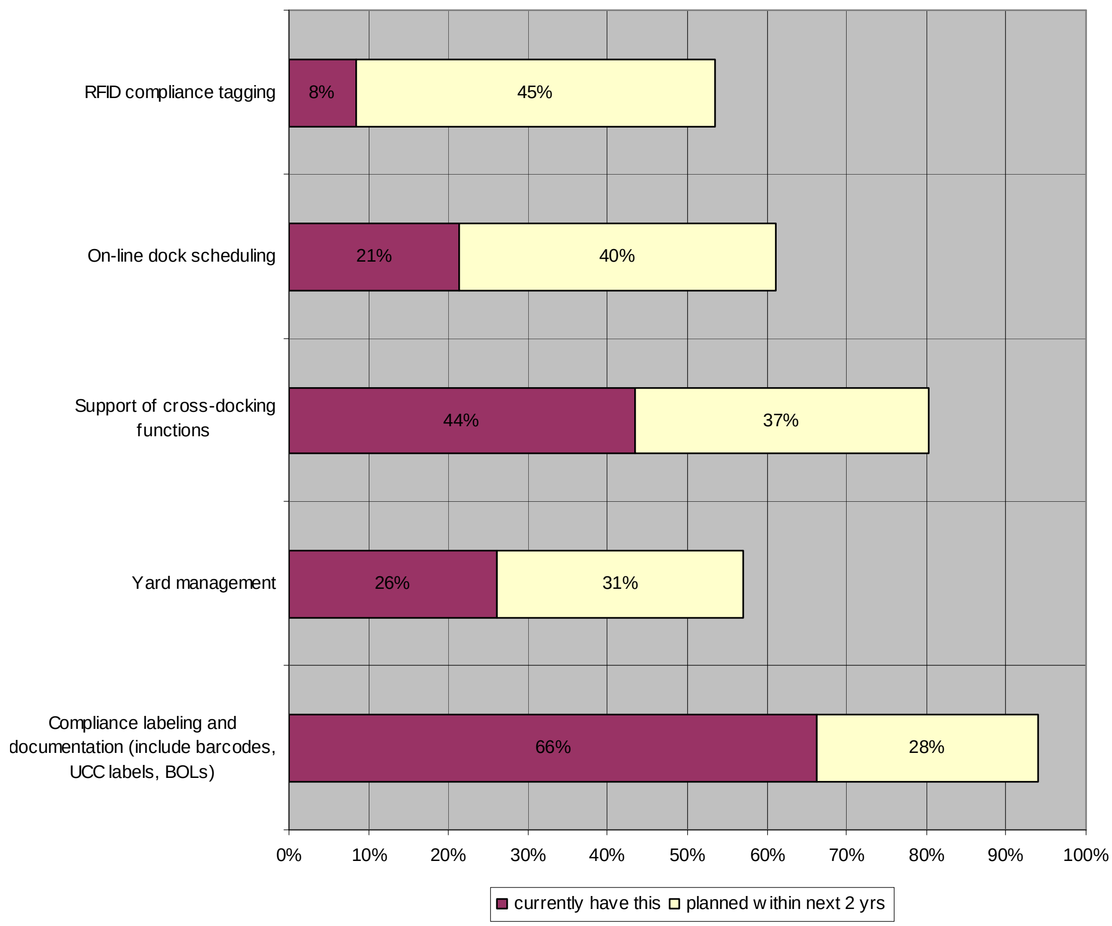
Focusing on Customer-Centric Processes

Customer-centric process improvements are led by the addition of RFID compliance processes (both slap and ship and more permanent RFID implementations) for those firms that have retail customers. Forty-five percent of respondents plan on adding this capability within the next two years. Compliance labeling and documentation continue as a key focus, as reflected in Figure 7. Companies are acknowledging the continuing role these functions will have in customer service by including them in their top five improvement plans moving forward.

Maintaining Internal Process Focus to Insure Cost-Effective Customer Service

While they have a strong focus on customer centric improvements, respondents are not forgetting the need to deliver these improvements cost effectively. Their expectation is that yard and dock management and the support of cross-docking functions will be strong enablers to keep their cost structures in line even as service levels improve.

Figure 6: Process Improvement Plans for Extended Warehouse Operations



Source: TKR Consulting Associates, August 2005

Best-in-Class Companies Are Complacent in Maintaining Their Lead

As mentioned above, the majority of companies feel they are currently well positioned in internal efficiency areas. This is true for best-in-class companies, which have few plans over the next two years to improve their capabilities. Laggard companies have a very different stance. They understand why they are laggards and are being much more aggressive at investing in those areas that have given the best-in-class companies the competitive advantage. In each focus area, this is true for more than 30% of laggards responding. With the exception of RFID compliance tagging, the majority of the laggards' plans are focused on more cost-effective fulfillment. These plans include support of cross dock operations (47%), on-line dock scheduling (41%), transportation management (37%), and management of remote facilities (36%). This emphasis by the laggards on efficiency areas will erode the lead currently enjoyed by the best-in-class. The laggards are also more aggressive in their improvement plans for customer-centric priorities. Specifically, they are more aggressive than the best-in-class in the addition of basic value-added support functions (32% vs. 14%), postponement strategy support (29% vs. 14%), and compliance labeling and documentation (33% vs. 14%).

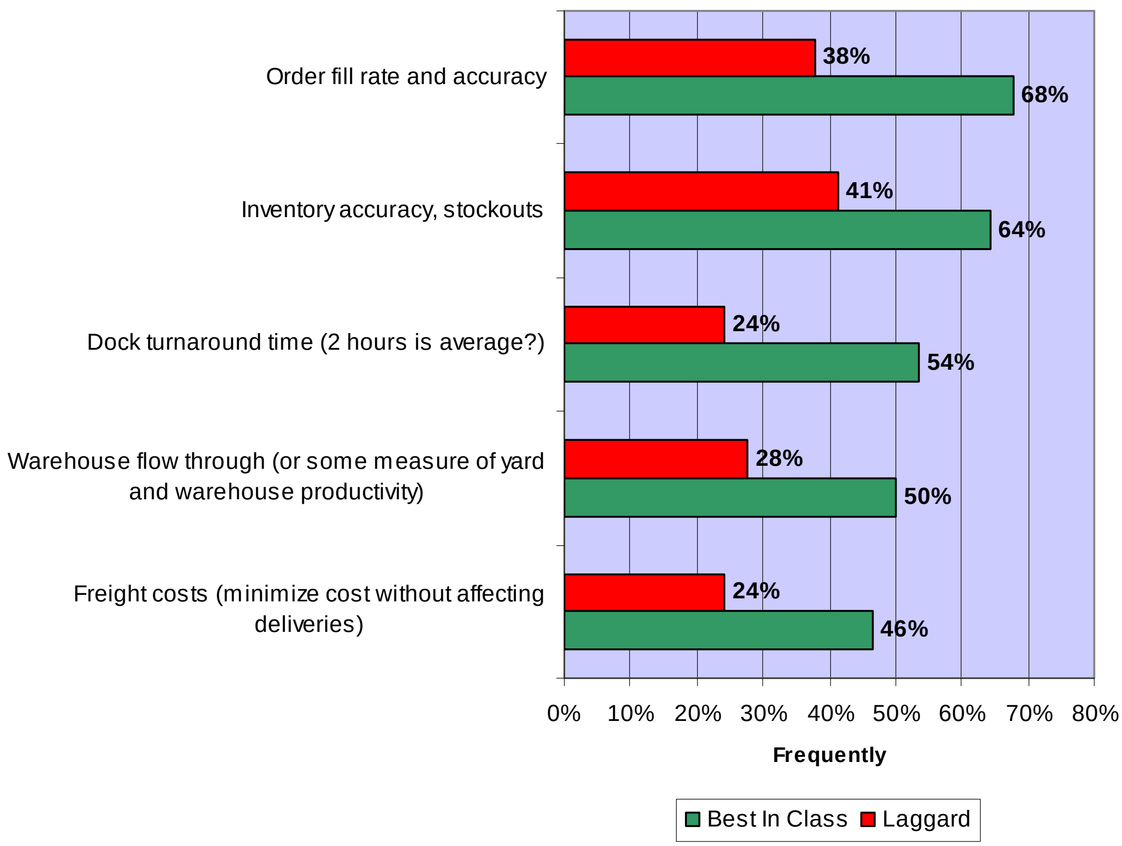
Daily KPI Programs Are Needed

To determine the success of extended warehouse management, 36% of all respondents agreed that frequency and specifics of Key Performance Indicators (KPI) programs are critical.

More than 50% of respondents indicated they only measured performance occasionally (weekly/monthly) or rarely (yearly/not at all). This is inadequate to effectively manage most operations. Even worse, measurements of customer satisfaction were done occasionally or rarely by over 80% of respondents. In a world where cost-effective customer service is paramount, this performance is inadequate. You can't improve what you don't measure.

Best-in-class companies maintain their position in large part because they drive to have enterprise-wide standard processes. These standard processes are reinforced by frequent assessment of performance and compliance to internal and external requirements. This is borne out in the comparison of frequently measured KPIs by best-in-class vs. laggard companies (figure 7).

Figure 7: Frequently Measured KPIs



Source: TKR Consulting Associates, August 2005

Recommendations for Action

Delivering outstanding customer service to drive cost-effective customer retention is the mantra for all fulfillment operations. The extension of warehouse management operations beyond the four walls of the warehouse is key to meeting that objective. The results of this study clearly identify the pressures that are driving companies. All companies regardless of size and current performance should do the following:

- Insure the KPI and continuous improvement programs are in place and that measures are taken frequently.
- Utilize the Fulfillment Solutions Framework in Chapter 2 to understand your own situation and to determine which process and technology solutions will deliver the most value to meeting the objective soonest.
- Synchronize transportation management and warehouse management processes to insure compliance with customer delivery instructions. If customers don't get what they want, when they want it, nothing else matters.
- Add processes that give visibility of supply chain transactions to all stakeholders. All fulfillment operations must have early warning systems to deal effectively with potential disruptions in the flow of goods and transactions.

Below are more-specific recommendations for action for companies based on their current maturity stage. Because of the new market pressures driven by customer requirements, even the best performing companies must undertake improvement initiatives or risk finding their hard-won competitive position and total cost advantages have eroded. Whether a company is trying to gradually move its logistics organization from "Laggard" to "Industry Norm," or "Industry Norm" to "Best in Class," the following actions will help spur performance improvements and help insure cost effective customer satisfaction:

Laggard Steps to Success

Master the basics and prepare the foundation for the next stage.

1. Implement KPI program with frequent use of measures focused on cost-effective customer satisfaction issues.
2. Develop standard processes for all facilities and apply them across the enterprise.
3. Initiate frequent coordination between warehouse and transportation operations.
4. Prioritize investment/improvement plans using the Fulfillment Solutions Framework and start those that will deliver the most immediate efficiencies and enable customer satisfaction. Consider:
    a. Rigorous adoption of performance measurements (KPIs)
    b. WMS and TMS integration
    c. Basic customer mandate compliance (labels and documentation)
    d. Basic value-added services (kitting, packaging)

Industry Norm Steps to Success

Refine the basics and extend processes across the enterprise to move forward to best-in-class status.

1. Extend the KPI program into a continuous improvement program.
2. Extend standard processes across the entire enterprise to include 3PLs and other satellite facilities.
3. Extend interdepartmental coordination to all departments, not just warehousing and transportation.
4. Implement a visibility solution/process that allows access to information about fulfillment operations (warehousing and transportation), as well customer compliance and satisfaction functions. Make this available to all stakeholders.
5. Continue technology improvements and execute the next items from the Fulfillment Solutions Framework:
    a. Extend WMS and TMS integration to customer service and order management operations.
    b. Provide access to basic information about orders and shipments across the enterprise.
    c. Implement a compliance management system that goes beyond the basics of labels and documents (e.g., supports workflow that can be tailored to individual customer profiles).
    d. Add/replace/extend WMS to get more value-added functions, especially those that support postponement strategies.
    e. Implement on-line dock scheduling and management.
    f. Implement yard management for large facilities.

Best-in-Class Next Steps

Don't be complacent. Defend your competitive advantage. Focus on customer service and customer retention without losing track of cost-effective fulfillment.

- Extend KPIs, continuous improvement, standard processes, and supply chain-wide coordination to trading partners.
- Re-invigorate technology and process change/improvement to protect the competitive advantage you currently enjoy.

Appendix A: *Research Methodology*

Between July and September 2004, Aberdeen Group and *Modern Material Handling* magazine examined the extended warehouse management procedures, experiences, and intentions of more than 135 enterprises in consumer packaged goods, retail/wholesale, distribution, and other industries.

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

- The degree to which extended warehouse management impacts corporate strategies, operations, and financial results
- The structure and effectiveness of existing extended warehouse management procedures
- Current and planned use of automation to aid these activities

Aberdeen supplemented this online survey effort with telephone interviews with select survey respondents, gathering additional information on service parts management strategies, experiences, and results.

The study aimed to identify emerging best practices for service parts management and provide a framework by which readers could assess their own extended warehouse management capabilities.

Responding enterprises included the following:

- Job title/function: The research sample included respondents with the following job titles: supply chain, logistics executive or vice president (4%); director or manager (53%); internal consultant (11%); CFO or other C-level officer (7%); and distribution or logistics staff (15%).
- Industry: The research sample included respondents predominantly from distribution and manufacturing industries. Distribution companies represented 19% of the sample, followed closely by consumer packaged goods manufacturers, which accounted for 14% of respondents. Retail or wholesale related companies totaled 13% of respondents.
- Geography: The vast majority of study respondents were from North America. Remaining respondents were from the United Kingdom, Australia, and the Asia-Pacific region.
- Company size: About 38% of respondents were from large enterprises (annual revenues above US$1 billion); 36% were from midsize enterprises (annual revenues between $50 million and $1 billion); and 26% of respondents were from small businesses (annual revenues of $50 million or less).

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