EXECUTIVE SUMMARY

Warehouse Management Systems

Technology for Global Supply Chain Performance

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June, 2007

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About ChainLink Research

ChainLink Research, Inc. is a Supply Chain research organization dedicated to helping executives improve business performance and competitiveness through an understanding of real-world implications, obstacles and results for supply-chain practices, processes, and technologies. The ChainLink Inter-Enterprise Model is the basis for our research; a unique, real-world framework that describes the multi-dimensional aspect of links between supply chain partners.

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Executive Summary

Customer service, the timely flow of goods to market, and value-adding services to partners in the supply chain, all require modern Warehouse Management Systems in order to succeed. The complexity inherent in the performance of these seemingly simple tasks consumes a major portion of the time, labor and cost of the supply chain. As such, the selection of the best possible WMS solution is critical—knowing what the options are and how to rate and evaluate functionality takes skill and an understanding of the business impact of the implementation.

Of late, these have been radical changes in the Supply Chain Market—especially in the Warehouse and Logistics sector. Mergers & Acquisitions, as well as new exciting capabilities, give the buyer new approaches to implementation as well as enhanced value. Today’s domain leaders in Warehouse management are real partners in your road to value—not just technology providers. And ERP providers are enriching their platforms with middleware and modern service oriented technologies to ensure there is a bridge between functional domains.

Not only enriching the business process to extract better performance has to be constantly reviewed, but also in today’s global supply chain, the Orchestration of the chain needs to be managed with 21st Century Supply Chain technology!

Today’s choices are better than ever!

This report has been designed to assist enterprises considering the implementation of warehouse management systems and provides both the novice and the information technology professional with a blueprint for evaluating and selecting appropriate technology for the distribution operations.

**WHY A WAREHOUSE MANAGEMENT REPORT?**

Warehouse operations are a critical element of any supply chain environment—whether internally operated or outsourced to a third party. Likened to a control valve that can be adjusted to meet variations in supply and demand, storage and distribution facilities are growing in importance for companies in spite of the focus on inventory reduction. Outsourcing and off-shoring manufacturing operations, Port congestion, risk of supply chain disruptions as well as the shortage of logistics and other services that can impact the smooth flow of goods from source locations can be offset by a network of storage facilities that enables the key elements of success for any enterprise. And the backroom of the Retailer, whether retailer or store operations, needs deft management to ensure that goods are flowing into the point of sales environments.
Warehouse management systems, despite their relative maturity, remain an area of opportunity for software vendors and users alike. The market penetration for most software packages is low enough to keep the focus on sales and product innovation, as well as revising research and thought leading publications on this topic.

The recent revival in the use of RFID and other auto identification technologies in the distribution environment highlight potential process improvements that can be achieved through the capture of more granular and ‘sensory’ data. While leveraging investments in existing information systems, supplemented by the capabilities of yard, transportation and warehouse management applications, it is possible to create a ‘virtual warehouse’ environment. This in turn provides the flexibility required to respond to changes in demand, and shortages of supply. There are many paths to take; ensuring that the desired outcome is clear is one of the keys to success in the selection of technology enablers and process improvement.

**So, how to begin?**

One of the first steps in evaluating and selecting a technology solution is to understand the business challenges—Policy, Performance or Process drivers—and from there, decide what Enabling technology (or service providers) are right for your business.

Right up front, we discourage a ‘company deployment strategy’. What we mean is that users should evaluate their options and find the *best solution* to solve the business problem.

Despite the promotional literature and web media, there is no single solution that ‘does it all’. Both large and small players have a different ‘sweet spot’ depending both on their heritage and their current partnering or acquisition strategy. The recent plethora of acquisitions of niche players by both WMS competitors and ERP vendors has further clouded the already muddy waters.

Our goal is to guide the reader through the steps in understanding what warehouse management technology is and does; which solutions apply to their specific environment, and the key differences between the wide range of options in the marketplace.
WHAT YOU WILL LEARN IN THIS REPORT

This report will provide the reader with an understanding of both practices, as well as enabling (technology or service) options.

There are many options out there—it is important to know the difference between a warehouse management system, an inventory control system and a stock location system. Believe it or not, there are still many applications that are being marketed as warehouse management systems but lack the rich functionality of a domain leadership suite of applications designed to monitor and control storage and distribution operations.

Cut your cloth to suit your coat—it is just as bad to have an over-engineered solution as it is to have manual process and procedures to run your operation. This report and guide will provide both operations and technical team members with the ability to grade and rate functionality based on both information and business needs.

ChainLink Research conducted the research for this report, through interviews with many firms that have successfully gained value from Warehouse Management practices. These are fresh and new stories. Therefore, in many cases, their firms have not approved the public pronouncements, so we may not always use their names. These interviews and cases provide an important validation point to the technology firm’s claims of the value of their capabilities.

On another note, this report was created with the user/buyer in mind. It was not sponsored or financially underwritten by any of the technology firms mentioned in this report. In some cases, these firms may not agree with our assessment.¹ This report is not a market report, i.e., focused at financials of market size and share. The audience is the buyer, and this is written for the user’s benefit.

¹ The templates that support this report will be updated frequently on the www.technologyevaluation.com site; so go there for the latest updates.
Understanding Warehouse Management Needs Today

All distribution operations are not equal! Storage and order fulfillment requirements will vary dependant on many factors—for example, seasonality of product, temperature control requirements, complexity of supply chain and inventory holding strategies. The warehouse of the present—and the future, should include flexibility to respond to fluctuations in demand, supply, and market factors that are a variable. Planning warehouse operations requires an understanding of the type of products to be received, stored and shipped. Streamlining the warehouse operations through a combination of industry best practices and information technology requires the same level of comprehension.

Unlike storage and material handling equipment purchases where it is possible to ‘touch and feel’ the product, investments in information system solutions require clear definition of the desired outcome and trust in the provider to deliver on the promise of their product. The procurement of such an ‘intangible’ requires an awareness of what is possible through implementing software with features and functions that will assist in process automation, data capturing and inventory management and control. Selecting a solution provider to translate the vision to an operational reality is an important step. Understanding the various options available will assist in further defining the best path to take. At a high level there are three primary options, delivered in very different ways.

The three options to be considered are:

- **Step 1 – Look at feature, function and delivery architecture**
  (on premise or On Demand)

- **Step 2 – Evaluate scalability based on trading partner ‘on-boarding’—**
  on a global level

- **Step 3 – When evaluating professional services offered, look for deep domain expertise to change process and procedures in support of new information system capabilities**
embraced by the links in extended supply chains. In most cases the delivery method includes some web or 'thin-client' component, presenting data to the community leveraging browser technology, PDA’s and mobile computing devices.

When evaluating options it is wise to not only plan for the current business environment, but to allow for flexibility in terms of the addition—or removal—of trading community members.

**PROCESS VIEWS AND MAJOR POSITIONING**

Technology is an enabler—the key to implementing software successfully is defining the business issues, understanding the real needs of the enterprise and what information is required in order to support the key operation indicators. Functionality requirements will vary, dependant on the role of the enterprise within the supply chain. The following includes a high level perspective of the primary enterprise models:

**Traditional Manufacturing Companies** — fully integrated process of design, make, store, deliver.

- Need capabilities that will support an integrated view across the supply process—raw materials to production to storage—distribution to retail. Outsource create a need to consider the information needs across extended supply chains—approaches can vary between treating outsource partner as a supplier or an ‘external/internal component’ of the process.

**Brand Masters** — own the brand but outsource primary operations functions.

- The sourcing model includes some level of collaborative information sharing during the design, make and deliver processes. Focus from an operational perspective is on the receipt of finished goods into distribution, managing inventory levels to meet demand and order fulfillment process. Capabilities required include detailed process view of inbound transportation, inventory within the fulfillment center, efficient pick, pack and ship processes to meet retail demand.
Where will the Technology Go Next?

The trend towards extended supply and distribution networks, as well as new auto/id technologies—RFID, sensors—will require technology solutions that are scalable and flexible. Traditional approaches will not be able to meet these needs; however, technological innovation abounds. A global adoption of various wireless networks, tiny devices, highly scalable Internet, and global standards, creates a whole new set of opportunities.

What will this mean for the warehouse worker of the future? Will the roles of those whose daily bread is made picking, packing and shipping change as dramatically as that of the factory worker of the previous century? The answer is a resounding YES!

Process automation is a given. Technology is now available that will enable a storage and distribution environment very different from the warehouse of the past.

Consider the following:

Material Handling—Smart Devices and Equipment

There is already a great deal of technology available for material handling within the warehouse environment. As the implementation of software enables entities to replace current with better practices, it will be possible to leverage investment in warehouse conveyances—for example AS/RS (Automatic storage and retrieval systems). In common use today are laser guided, pick-to-light, high rack warehousing with automated forklifts, etc.

In addition, there is now a convergence between traditional material handling equipment (such as forklifts) and auto identification and data capture technology. Smart robots that can locate goods, retrieve them and bring them to final shipping dock are also growing in popularity.

Smart buildings and Real-time Locating

Innovation in facilities management can be incorporated into space planning and facility control in the distribution environment. Real time locating (RTLS) technology provides capabilities to manage and monitor the movement of personnel and equipment. Integrated with ‘facility maps’, it will be possible to direct workers through a facility, reducing dwell time. WMS capabilities, triggered by RFID and other auto identification technology, will reduce the need to match product to specific storage locations, reducing ‘honeycombing’—a common result of fixed location storage.

Read the report: Active RFID ChainLink Research July 2007

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<td>Picking - RF, To List, Label, Special Instructions</td>
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Full Report rates the WMS Solutions on all of these attributes.

Table 3 — Vendor Profiles