A warehouse management system, or WMS, is a key part of the supply chain and primarily aims to control the movement and storage of materials within a warehouse and process the associated transactions, including shipping, receiving, putaway and picking. The systems also direct and optimize stock putaway based on real-time information about the status of bin utilization.

Warehouse management systems often utilize Auto ID Data Capture (AIDC) technology, such as barcode scanners, mobile computers, wireless LANs and potentially Radio-frequency identification (RFID) to efficiently monitor the flow of products. Once data has been collected, there is either a batch synchronization with, or a real-time wireless transmission to a central database. The database can then provide useful reports about the status of goods in the warehouse.

The objective of a warehouse management system is to provide a set of computerised procedures to handle the receipt of stock and returns into a warehouse facility, model and manage the logical representation of the physical storage facilities (e.g. racking etc), manage the stock within the facility and enable a seamless link to order processing and logistics management in order to pick, pack and ship product out of the facility.

Warehouse management systems can be stand alone systems, or modules of an ERP system or supply chain execution suite.

The primary purpose of a WMS is to control the movement and storage of materials within a warehouse – you might even describe it as the legs at the end-of-the line which automates the store, traffic and shipping management.

In its simplest form, the WMS can data track products during the production process and act as an interpreter and message buffer between existing ERP and WMS systems. Warehouse Management is not just managing within the boundaries of a warehouse today, it is much wider and goes beyond the physical boundaries. Inventory management, inventory planning, cost management, IT applications & communication technology to be used are all related to warehouse management. The container storage, loading and unloading are also covered by warehouse management today. Warehouse management today is part of SCM and demand management. Even production management is to a great extent dependent on warehouse management. Efficient warehouse management gives a cutting edge to a retail chain distribution company. Warehouse management does not just start with receipt of material but it actually starts with actual initial planning when container design is made for a product. Warehouse design and process design within the warehouse (e.g. Wave Picking) is also part of warehouse management. Warehouse management is part of Logistics and SCM.

Warehouse Management monitors the progress of products through the warehouse. It involves the physical warehouse infrastructure, tracking systems, and communication between product stations.

Warehouse management deals with receipt, storage and movement of goods, normally finished goods, to intermediate storage locations or to final customer. In the multi-echelon model for distribution, there are levels of warehouses, starting with the Central Warehouse(s), regional warehouses services by the central warehouses and retail warehouses at the third level services by the regional warehouses and so on. The objective of warehousing management is to help in optimal cost of timely order fulfillment by managing the resources economically. Warehouse management = "Management of storage of products and services rendered on the products within the four wall of a warehouse"
A supply chain is a system of organizations, people, technology, activities, information and resources involved in moving a product or service from supplier to customer. Supply chain activities transform natural resources, raw materials and components into a finished product that is delivered to the end customer. In sophisticated supply chain systems, used products may re-enter the supply chain at any point where residual value is recyclable. Supply chains link value chains.[1]

The Council of Supply Chain Management Professionals (CSCMP) defines Supply Chain Management as follows: “Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies. Supply Chain Management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities noted above, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance and information technology.”


A typical supply chain begins with ecological and biological regulation of natural resources, followed by the human extraction of raw material, and includes several production links (e.g., component construction, assembly, and merging) before moving on to several layers of storage facilities of ever-decreasing size and ever more remote geographical locations, and finally reaching the consumer.

Many of the exchanges encountered in the supply chain will therefore be between different companies that will seek to maximize their revenue within their sphere of interest, but may have little or no knowledge or interest in the remaining players in the supply chain. More recently, the loosely coupled, self-organizing network of businesses that cooperates to provide product and service offerings has been called the Extended Enterprise.[3]
Supply chain modeling

A diagram of a supply chain. The black arrow represents the flow of materials and information and the gray arrow represents the flow of information and backhauls. The elements are (a) the initial supplier, (b) a supplier, (c) a manufacturer, (d) a customer, (e) the final customer.

There are a variety of supply chain models, which address both the upstream and downstream sides.

The SCOR (Supply Chain Operations Reference) model, developed by the Supply Chain Council, measures total supply chain performance. It is a process reference model for supply-chain management, spanning from the supplier's supplier to the customer's customer. It includes delivery and order fulfillment performance, production flexibility, warranty and returns processing costs, inventory and asset turns, and other factors in evaluating the overall effective performance of a supply chain.

The Global Supply Chain Forum (GSCF) introduced another Supply Chain Model. This framework is built on eight key business processes that are both cross-functional and cross-firm in nature. Each process is managed by a cross-functional team, including representatives from logistics, production, purchasing, finance, marketing and research and development. While each process will interface with key customers and suppliers, the customer relationship management and supplier relationship management processes form the critical linkages in the supply chain.

The American Productivity & Quality Center (APQC) Process Classification Framework (PCF) is a high-level, industry-neutral enterprise process model that allows organizations to see their business processes from a cross-industry viewpoint. The PCF was developed by APQC and its member companies as an open standard to facilitate improvement through process management and benchmarking, regardless of industry, size, or geography. The PCF organizes operating and management processes into 12 enterprise level categories, including process groups and over 1,000 processes and associated activities.

Supply chain management

In the 1980s, the term Supply Chain Management (SCM) was developed to express the need to integrate the key business processes, from end user through original suppliers. Original suppliers being those that provide products, services and information that add value for customers and other stakeholders. The basic idea behind the SCM is that companies and corporations involve themselves in a supply chain by exchanging information regarding market fluctuations and production capabilities.

If all relevant information is accessible to any relevant company, every company in the supply chain has the possibility to and can seek to help optimizing the entire supply chain rather than sub optimize based on a local interest. This will lead to better planned overall production and distribution which can cut costs and give a more attractive final product leading to better sales and better overall results for the companies involved.

Incorporating SCM successfully leads to a new kind of competition on the global market where competition is no longer of the company versus company form but rather takes on a supply chain versus supply chain form.
Many electronics manufacturers of Guangdong rely on supply of parts from numerous component shops in Guangzhou.

The primary objective of supply chain management is to fulfill customer demands through the most efficient use of resources, including distribution capacity, inventory and labor. In theory, a supply chain seeks to match demand with supply and do so with the minimal inventory. Various aspects of optimizing the supply chain include liaising with suppliers to eliminate bottlenecks; sourcing strategically to strike a balance between lowest material cost and transportation, implementing JIT (Just In Time) techniques to optimize manufacturing flow; maintaining the right mix and location of factories and warehouses to serve customer markets, and using location/allocation, vehicle routing analysis, dynamic programming and, of course, traditional logistics optimization to maximize the efficiency of the distribution side.

There is often confusion over the terms supply chain and logistics. It is now generally accepted that the term Logistics applies to activities within one company/organization involving distribution of product whereas the term supply chain also encompasses manufacturing and procurement and therefore has a much broader focus as it involves multiple enterprises, including suppliers, manufacturers and retailers, working together to meet a customer need for a product or service.

Starting in the 1990s several companies chose to outsource the logistics aspect of supply chain management by partnering with a 3PL, Third-party logistics provider. Companies also outsource production to contract manufacturers.

There are actually four common Supply Chain Models. Besides the two mentioned above, there are the American Productivity & Quality Center’s (APQC) Process Classification Framework and the Supply Chain Best Practices Framework.
A warehouse is a commercial building for storage of goods.Warehouses are used by manufacturers, importers, exporters, wholesalers, transport businesses, customs, etc. They are usually large plain buildings in industrial areas of cities and towns. They usually have loading docks to load and unload goods from trucks. Sometimes warehouses load and unload goods directly from railways, airports, or seaports. They often have cranes and forklifts for moving goods, which are usually placed on ISO standard pallets loaded into pallet racks.

**Automatic Identification and Data Capture (AIDC)** refers to the methods of automatically identifying objects, collecting data about them, and entering that data directly into computer systems (i.e. without human involvement). Technologies typically considered as part of AIDC include bar codes, Radio Frequency Identification (RFID), biometrics, magnetic stripes, Optical Character Recognition (OCR), smart cards, and voice recognition. AIDC is also commonly referred to as “Automatic Identification,” “Auto-ID,” and “Automatic Data Capture.”

AIDC is the process or means of obtaining external data, particularly through analysis of images, sounds or videos. To capture data, a transducer is employed which converts the actual image or a sound into a digital file. The file is then stored and at a later time it can be analyzed by a computer, or compared with other files in a database to verify identity or to provide authorization to enter a secured system. Capturing of data can be done in various ways; the best method depends on application.

AIDC also refers to the methods of recognizing objects, getting information about them and entering that data or feeding it directly into computer systems without any human involvement. Automatic identification and data capture technologies include barcodes, RFID, biometrics, magnetic stripes, smart cards and biometrics (like iris and facial recognition system).

In biometric security systems, capture is the acquisition of or the process of acquiring and identifying characteristics such as finger image, palm image, facial image, iris print or voice print which involves audio data and the rest all involves video data.

Radio frequency identification (RFID) is relatively a new AIDC technology which was first developed in 1980’s. The technology acts as a base in automated data collection, identification and analysis systems worldwide. RFID has found its importance in a wide range of markets including livestock identification and Automated Vehicle Identification (AVI) systems because of its capability to track moving objects. These automated wireless AIDC systems are effective in manufacturing environments where barcode labels could not survive.

The evolution of warehouse management systems (WMS) is very similar to that of many other software solutions. Initially a system to control movement and storage of materials within a warehouse, the role of WMS is expanding to including light manufacturing, transportation management, order management, and complete accounting systems. To use the grandfather of operations-related software, MRP, as a comparison, material requirements planning (MRP) started as a system for planning raw material requirements in a manufacturing environment. Soon MRP evolved into manufacturing resource planning (MRPII), which took the basic MRP system and added scheduling and capacity planning logic. Eventually MRPII evolved into enterprise resource planning (ERP), incorporating all the MRPII functionality with full financials and customer and vendor management functionality. Now, whether WMS evolving into a warehouse-focused ERP system is a good thing or not is up to debate. What is clear is that the expansion of the overlap in functionality between Warehouse Management Systems, Enterprise Resource Planning, Distribution Requirements Planning, Transportation Management Systems, Supply
Chain Planning, Advanced Planning and Scheduling, and Manufacturing Execution Systems will only increase the level of confusion among companies looking for software solutions for their operations.

Even though WMS continues to gain added functionality, the initial core functionality of a WMS has not really changed. The primary purpose of a WMS is to control the movement and storage of materials within an operation and process the associated transactions. Directed picking, directed replenishment, and directed putaway are the key to WMS. The detailed setup and processing within a WMS can vary significantly from one software vendor to another, however the basic logic will use a combination of item, location, quantity, unit of measure, and order information to determine where to stock, where to pick, and in what sequence to perform these operations.

At a bare minimum, a WMS should:

- Have a flexible location system.
- Utilize user-defined parameters to direct warehouse tasks and use live documents to execute these tasks.
- Have some built-in level of integration with data collection devices.

Do You Really Need WMS?

Not every warehouse needs a WMS. Certainly any warehouse could benefit from some of the functionality but is the benefit great enough to justify the initial and ongoing costs associated with WMS? Warehouse Management Systems are big, complex, data intensive, applications. They tend to require a lot of initial setup, a lot of system resources to run, and a lot of ongoing data management to continue to run. That's right, you need to "manage" your warehouse "management" system. Often times, large operations will end up creating a new IS department with the sole responsibility of managing the WMS.

The Claims:

- WMS will reduce inventory!
- WMS will reduce labor costs!
- WMS will increase storage capacity!
- WMS will increase customer service!
- WMS will increase inventory accuracy!

The Reality:

The implementation of a WMS along with automated data collection will likely give you increases in accuracy, reduction in labor costs (provided the labor required to maintain the system is less than the labor saved on the warehouse floor), and a greater ability to service the customer by reducing cycle times. Expectations of inventory reduction and increased storage capacity are less likely. While increased accuracy and efficiencies in the receiving process may reduce the level of safety stock required, the impact of this reduction will likely be negligible in comparison to overall inventory levels. The predominant factors that control inventory levels are lot sizing, lead times, and demand variability. It is unlikely that a WMS will have a significant impact on any of these factors. And while a
WMS certainly provides the tools for more organized storage which may result in increased storage capacity, this improvement will be relative to just how sloppy your pre-WMS processes were.

Beyond labor efficiencies, the determining factors in deciding to implement a WMS tend to be more often associated with the need to do something to service your customers that your current system does not support (or does not support well) such as first-in-first-out, cross-docking, automated pick replenishment, wave picking, lot tracking, yard management, automated data collection, automated material handling equipment, etc.

**Setup**

The setup requirements of WMS can be extensive. The characteristics of each item and location must be maintained either at the detail level or by grouping similar items and locations into categories. An example of item characteristics at the detail level would include exact dimensions and weight of each item in each unit of measure the item is stocked (eaches, cases, pallets, etc) as well as information such as whether it can be mixed with other items in a location, whether it is rackable, max stack height, max quantity per location, hazard classifications, finished goods or raw material, fast versus slow mover, etc. Although some operations will need to set up each item this way, most operations will benefit by creating groups of similar products. For example, if you are a distributor of music CDs you would create groups for single CDs, and double CDs, maintaining the detailed dimension and weight information at the group level and only needing to attach the group code to each item. You would likely need to maintain detailed information on special items such as boxed sets or CDs in special packaging. You would also create groups for the different types of locations within your warehouse. An example would be to create three different groups (P1, P2, P3) for the three different sized forward picking locations you use for your CD picking. You then set up the quantity of single CDs that will fit in a P1, P2, and P3 location, quantity of double CDs that fit in a P1, P2, P3 location etc. You would likely also be setting up case quantities, and pallet quantities of each CD group and quantities of cases and pallets per each reserve storage location group.

If this sounds simple, it is…well…sort of. In reality most operations have a much more diverse product mix and will require much more system setup. And setting up the physical characteristics of the product and locations is only part of the picture. You have set up enough so that the system knows where a product can fit and how many will fit in that location. You now need to set up the information needed to let the system decide exactly which location to pick from, replenish from/to, and putaway to, and in what sequence these events should occur (remember WMS is all about “directed” movement). You do this by assigning specific logic to the various combinations of item/order/quantity/location information that will occur.

Below I have listed some of the logic used in determining actual locations and sequences.

- **Location Sequence.** This is the simplest logic; you simply define a flow through your warehouse and assign a sequence number to each location. In order picking this is used to sequence your picks to flow through the warehouse, in putaway the logic would look for the first location in the sequence in which the product would fit.

- **Zone Logic.** By breaking down your storage locations into zones you can direct picking, putaway, or replenishment to or from specific areas of your warehouse. Since zone logic only designates an area, you will need to combine this with some other type of logic to determine exact location within the zone.
**Fixed Location.** Logic uses predetermined fixed locations per item in picking, putaway, and replenishment. Fixed locations are most often used as the primary picking location in piece pick and case-pick operations, however, they can also be used for secondary storage.

**Random Location.** Since computers cannot be truly random (nor would you want them to be) the term random location is a little misleading. Random locations generally refer to areas where products are not stored in designated fixed locations. Like zone logic, you will need some additional logic to determine exact locations.

**First-in-first-out (FIFO).** Directs picking from the oldest inventory first.

**Last-in-first-out (LIFO).** Opposite of FIFO. I didn’t think there were any real applications for this logic until a visitor to my site sent an email describing their operation that distributes perishable goods domestically and overseas. They use LIFO for their overseas customers (because of longer in-transit times) and FIFO for their domestic customers.

**Quantity or Unit-of-measure.** Allows you to direct picking from different locations of the same item based upon the quantity or unit-of-measured ordered. For example, pick quantities less than 25 units would pick directly from the primary picking location while quantities greater than 25 would pick from reserve storage locations.

**Fewest Locations.** This logic is used primarily for productivity. Pick-from-fewest logic will use quantity information to determine least number of locations needed to pick the entire pick quantity. Put-to-fewest logic will attempt to direct putaway to the fewest number of locations needed to stock the entire quantity. While this logic sounds great from a productivity standpoint, it generally results in very poor space utilization. The pick-from-fewest logic will leave small quantities of an item scattered all over your warehouse, and the put-to-fewest logic will ignore small and partially used locations.

**Pick-to-clear.** Logic directs picking to the locations with the smallest quantities on hand. This logic is great for space utilization.

**Reserved Locations.** This is used when you want to predetermine specific locations to putaway to or pick from. An application for reserved locations would be cross-docking, where you may specify certain quantities of an inbound shipment be moved to specific outbound staging locations or directly to an awaiting outbound trailer.

**Nearest Location.** Also called proximity picking/putaway, this logic looks to the closest available location to that of the previous putaway or pick. You need to look at the setup and test this type of logic to verify that it is picking the shortest route and not the actual nearest location. Since the shortest distance between two points is a straight line, this logic may pick a location 30 feet away (thinking it’s closest) that requires the worker to travel 200 feet up and down aisles to get to it while there was another available location 50 feet away in the same aisle (50 is longer than 30).

**Maximize Cube.** Cube logic is found in most WMS systems however it is seldom used. Cube logic basically uses unit dimensions to calculate cube (cubic inches per unit) and then compares this to the cube capacity of the location to determine how much will fit. Now if the units are capable of being stacked into the location in a manner that fills every cubic inch of space in the location, cube logic will work. Since this rarely happens in the real world, cube logic tends to be impractical.

**Consolidate.** Looks to see if there is already a location with the same product stored in it with available capacity. May also create additional moves to consolidate like product stored in multiple locations.

**Lot Sequence.** Used for picking or replenishment, this will use the lot number or lot date to determine locations to pick from or replenish from.
It’s very common to combine multiple logic methods to determine the best location. For example you may choose to use pick-to-clear logic within first-in-first-out logic when there are multiple locations with the same receipt date. You also may change the logic based upon current workload. During busy periods you may chose logic that optimizes productivity while during slower periods you switch to logic that optimizes space utilization.

Other Functionality/Considerations

**Wave Picking/Batch Picking/Zone Picking.** Support for various picking methods varies from one system to another. In high-volume fulfillment operations, picking logic can be a critical factor in WMS selection. See my article on [Order Picking](#) for more info on these methods.

**Task Interleaving.** Task interleaving describes functionality that mixes dissimilar tasks such as picking and putaway to obtain maximum productivity. Used primarily in full-pallet-load operations, task interleaving will direct a lift truck operator to put away a pallet on his/her way to the next pick. In large warehouses this can greatly reduce travel time, not only increasing productivity, but also reducing wear on the lift trucks and saving on energy costs by reducing lift truck fuel consumption. Task interleaving is also used with cycle counting programs to coordinate a cycle count with a picking or putaway task.

**Automated Data Collection (ADC).** It is generally assumed when you implement WMS that you will also be implementing automatic data collection, usually in the form of radio-frequency (RF) portable terminals with bar code scanners. I recommend incorporating your ADC hardware selection and your software selection into a single process. This is especially true if you are planning on incorporating alternate technologies such as voice systems, RFID, or light-directed systems. You may find that a higher priced WMS package will actually be less expensive in the end since it has a greater level of support for the types of ADC hardware you will be using. In researching WMS packages you may see references like “supports”, “easily integrates with”, “works with”, “seamlessly interfaces with” in describing the software’s functionality related to ADC. Since these statements can mean just about anything, you’ll find it important to ask specific questions related to exactly how the WMS system has been programmed to accommodate ADC equipment. Some WMS products have created specific versions of programs designed to interface with specific ADC devices from specific manufacturers. If this WMS/ADC device combination works for your operation you can save yourself some programming/setup time. If the WMS system does not have this specific functionality, it does not mean that you should not buy the system, it just means that you will have to do some programming either on the WMS system or on the ADC devices. Since programming costs can easily put you over budget you’ll want to have an estimate of these costs up front. As long as you are working closely with the WMS vendor and the ADC hardware supplier at an early stage in the process you should be able to avoid any major surprises here. [Read my article on ADC](#).

**Integration with Automated Material Handling Equipment.** If you are planning on using automated material handling equipment such as carousels, ASRS units, AGVs, pick-to-light systems, or sortation systems, you’ll want to consider this during the software selection process. Since these types of automation are very expensive and are usually a core component of your warehouse, you may find that the equipment will drive the selection of the WMS. As with automated data collection, you should be working closely with the equipment manufacturers during the software selection process.

**Advanced Shipment Notifications (ASN).** If your vendors are capable of sending advanced shipment notifications (preferably electronically) and attaching compliance labels to the shipments you will want to make sure that the WMS can use this to automate your receiving process. In addition, if you have requirements to provide ASNs for customers, you will also want to verify this functionality.
Cycle Counting. Most WMS will have some cycle counting functionality. Modifications to cycle counting systems are common to meet specific operational needs. Read my article on Cycle Counting and check out my book on Inventory Accuracy and Cycle Counting.

Cross Docking. In its purest form cross-docking is the action of unloading materials from an incoming trailer or rail car and immediately loading these materials in outbound trailers or rail cars thus eliminating the need for warehousing (storage). In reality pure cross-docking is less common; most “cross-docking” operations require large staging areas where inbound materials are sorted, consolidated, and stored until the outbound shipment is complete and ready to ship. If cross docking is part of your operation you will need to verify the logic the WMS uses to facilitate this.

Pick-to-Carton. For parcel shippers pick-to-carton logic uses item dimensions/weights to select the shipping carton prior to the order picking process. Items are then picked directly into the shipping carton. When picking is complete, dunnage is added and the carton sealed eliminating a formal packing operation. This logic works best when picking/packing products with similar size/weight characteristics. In operations with a very diverse product mix it’s much more difficult to get this type of logic to work effectively.

Slotting. Slotting describes the activities associated with optimizing product placement in pick locations in a warehouse. There are software packages designed just for slotting, and many WMS packages will also have slotting functionality. Slotting software will generally use item velocity (times picked), cube usage, and minimum pick face dimensions to determine best location.

Yard Management. Yard management describes the function of managing the contents (inventory) of trailers parked outside the warehouse, or the empty trailers themselves. Yard management is generally associated with cross docking operations and may include the management of both inbound and outbound trailers.

Labor Tracking/Capacity Planning. Some WMS systems provide functionality related to labor reporting and capacity planning. Anyone that has worked in manufacturing should be familiar with this type of logic. Basically, you set up standard labor hours and machine (usually lift trucks) hours per task and set the available labor and machine hours per shift. The WMS system will use this info to determine capacity and load. Manufacturing has been using capacity planning for decades with mixed results. The need to factor in efficiency and utilization to determine rated capacity is an example of the shortcomings of this process. Not that I’m necessarily against capacity planning in warehousing, I just think most operations don’t really need it and can avoid the disappointment of trying to make it work. I am, however, a big advocate of labor tracking for individual productivity measurement. Most WMS maintain enough data to create productivity reporting. Since productivity is measured differently from one operation to another you can assume you will have to do some minor modifications here (usually in the form of custom reporting).

Activity-based costing/billing. This functionality is primarily designed for third-party logistics operators. Activity-based billing allows them to calculate billable fees based upon specific activities. For example, a 3PL can assign transaction fees for each receipt, and shipment transaction, as well as fees for storage and other value-added activities.

Integration with existing accounting/ERP systems. Unless the WMS vendor has already created a specific interface with your accounting/ERP system (such as those provided by an approved business partner) you can expect to spend some significant programming dollars here. While we are all hoping that integration issues will be magically resolved someday by a standardized interface, we ain’t there yet. Ideally you’ll want an integrator that has already integrated the WMS you chose with the business software you are using. Since this is not always possible you at least want an integrator that is very familiar with one of the systems.
WMS + everything else = ? As I mentioned at the beginning of this article, a lot of other modules are being added to WMS packages. These would include full financials, light manufacturing, transportation management, purchasing, and sales order management. I don’t see this as a unilateral move of WMS from an add-on module to a core system, but rather an optional approach that has applications in specific industries such as 3PLs. Using ERP systems as a point of reference, it is unlikely that this add-on functionality will match the functionality of best-of-breed applications available separately. If warehousing/distribution is your core business function and you don’t want to have to deal with the integration issues of incorporating separate financials, order processing, etc. you may find these WMS based business systems are a good fit.

Implementation Tips

Outside of the standard “don’t underestimate”, “thoroughly test”, “train, train, train” implementation tips that apply to any business software installation (read my article Software Selection and Implementation Tips) it’s important to emphasize that WMSs are very data dependent and restrictive by design. That is, you need to have all of the various data elements in place for the system to function properly. And, when they are in place, you must operate within the set parameters.
Warehouse Management

Warehouse Management: Solutions, Systems and Software

From before an inbound shipment enters your gate until after an outbound shipment leaves, Warehouse Management solution optimizes every move – from raw materials to finished goods, and the people who move them - helping enable agile, efficient and lean distribution operations that can deliver the perfect order. That means lower distribution costs and happier customers.

- Comprehensive task optimization technology, including embedded 3D mapping – out-of-the-box!
- Mature SOA technology – proven in hundreds of production sites for over 10 years – enabling faster, less costly implementations, greater agility to meet changing business conditions, and lower total cost of ownership.
- Over 35 years of industry experience helping leading manufacturers, distributors and retailers optimize their distribution networks.
- A unique vision and technology that integrates and synchronizes operations from extended supply networks all the way to the “last yard” of the retail shelf.

Distributed Order Management
- Inbound Processing
- Inventory Management
- Work Order Processing
- Outbound Processing
- Asset Management
- Warehouse Tasking
- Pick to Sequence
- International Trade and Customs

By optimizing every move in the DC Warehouse Management helps your operations run more smoothly, accurately and efficiently. Nothing is left to chance or the whims of individual workers. Workflow and throughput act like a well-oiled machine. Warehouse Management can maximize the value of your DC and help produce strong return on your supply chain management investment.

Reporting

To be effective, reporting must be flexible, easy to use, and able to display all of your data exactly the way you’d like it. That’s why we developed our Reporting system to be the natural complement to our Supply Chain Execution suite of applications. It has embedded graphics to make information easy to understand, powerful analytical capabilities to get at the root cause of problems, and automatic generation capabilities so your favorite reports get delivered when you want them. This cross-functional information can help you make more timely, better-informed decisions.

Slotting

Properly slotting your pickfaces to match order demand is a proven way to increase picking efficiency and throughput while reducing costs. The more dynamic your order patterns, the more you can save.

But not all slotting plans produce ROI. You have to understand the effort involved as well as the savings. That’s why our Slotting is integrated to both Warehouse Management and Workforce Management – so we can calculate both the effort and the savings of each plan, and give you the true ROI so you can select the best option.

Supplier Management

Manufacturers and distributors need a low cost, easily deployable vehicle for communicating with suppliers, co-packers, and remote manufacturing or distribution facilities. Supplier Management application provides this capability through remote order transmission and receipt, ASN based shipping and receiving, real-time visibility into production, and inventory control across extended supply networks. It brings collaborative commerce and logistics synchronization together through a robust, web-deployable module that delivers real value with low risk. The result is a supply network that can function as if it were a single entity.