The ERP Warehouse Module vs. Best-of-Breed WMS

The effective management of your warehouse and fulfillment/distribution operations is critical to the ongoing success of your business—but you're unsure whether to select your ERP's warehouse module or a best-of-breed warehouse management system. Unfortunately, the answer is not simple. In today's tight economy, there is significant pressure to use the warehouse module from your ERP vendor because its price is usually heavily discounted as part of the original ERP license or the cost of integration is presumed to be lower.

The fact is, implementing an add-on ERP module without fully understanding the implications to your business could actually prove more costly when considering the potential impact on total cost of ownership (TCO), competitive advantage and customer satisfaction. Your system's total cost of ownership is determined by all costs associated with initial implementation, which includes functionality fit, any up-front business process modifications, and integration; the ease of adapting the solution to your ever-changing requirements on an ongoing basis; and the upgrade process. In today's highly competitive economy, the ability to respond to changing business and customer requirements more effectively and more quickly than your competitors is a key consideration. The strategic importance of your selection cannot be overstated. Budget overruns, dissatisfied customers and lost competitive advantage are very real threats.

With so much weighing on making the right decision for your business, the importance of learning more about the true differences between ERP warehouse modules and best-of-breed warehouse management systems is clear. This paper will examine the various areas that can be used to help determine which type of solution is the best fit for your business. This examination will include the following:

1. **Business Strategy**
2. **Maximizing Business Results: The Cost Factor**
3. **Functionality Fit**
4. **Vendor Focus on Supply Chain Solutions**
5. **Company Culture**
6. **Infrastructure and Architecture**
7. **Product Composition and Maturity**
8. **Implementation and Ongoing Support**
9. **Conclusion**

As you look at the topics listed, you will see that different organizations within your company will focus on different items. If you are an IT or operations professional, Implementation and Ongoing Support will be of key concern. Many of the other topics listed will also be important to you, including Functionality Fit, Vendor Focus, Company Culture, Infrastructure and Architecture, and Product Composition and Maturity. However, at the end of the day, Maximizing Business Results is the most critical component of all. Getting the value that meets your core business strategy is what truly matters. All of these items need to be viewed with this perspective in mind.

1. Business Strategy

Before you make a decision on which approach to choose—your ERP's warehouse module or a best-of-breed WMS—it is imperative to understand the business strategy, tactics, operational requirements and goals the system is intended to support. This might seem obvious, but when it comes to execution, the business strategy is often given lip service as opposed to serious consideration. Without a detailed understanding of all the requirements that need to be met, a sound decision is impossible.

The ERP approach and the best-of-breed WMS approach have radically different capabilities that will ultimately affect the success of the project. This success needs to be measured by the ability of the chosen solution to enhance business value. Line

executives must recognize that this decision will drive their ability to deliver on their key performance indicator (KPI) goals. Because of this, they must be directly involved in making the decision. This cannot be left solely to technology-centered analysis. It must be a collaborative effort. The only reasons that will make sense in determining the decision are those that will enable you to drive value to the bottom line as measured by the KPIs. These should include the following:

- Your customers' requirements
- The nature of the competitive landscape, and what it will take for your business to differentiate itself
- The level of domain expertise your business has with respect to supply chain execution and warehouse and fulfillment operations
- The technical expertise of your business
- Any appropriate technology standards that have been adopted

Additionally, you must balance the value derived from all of these areas against the cost, implementation and timeframe risks of the path being considered. As an aid to evaluating vendors in this area, consider the following questions:

- What are your business' long-term objectives?
- How do you measure performance? What are the key metrics?
- How do your customer service requirements impact these objectives?
- What execution capabilities (or metrics) must be supported to meet these objectives?
- What must your business do to differentiate itself in the marketplace?
- What are the logical first steps to accomplish these objectives?

2. Maximizing Business Results: The Cost Factor

The key measure of the project's success is whether the implementation of warehousing capability maximizes business results. This can be measured by comparing the benefits your business receives versus the cost required to generate them. Even if the ERP warehouse module is presumed to be "free," it may not generate an ROI equivalent to that of a best-of-breed WMS because it lacks key functionality, or the vendor lacks the domain expertise to deliver missing functions through customization.

This is more about the TCBO, the total cost of business opportunity, than it is about TCO, the total cost of ownership. Functional fit, operational effectiveness, order-fulfillment costs, customer satisfaction and integration with existing modules/applications all contribute to the TCBO equation. Other factors include labor and inventory costs and productivity.

Unfortunately, most organizations focus only on controlling the initial costs of purchasing the solution and overlook the need to contain implementation costs. This often translates into buying the ERP warehouse module because it is included in a bundled license agreement. It is hard to convince most CFOs that a license that costs money is a less expensive option than one that is essentially free. But this measure is limited at best.

The additional costs that must be considered are the complexity of the implementation and the skills and time required to execute it; the functional fit of the solution and its ability to meet functional requirements without added time and cost to modify the product; and the training fees and learning curve end-users should expect.

The compromises made for functionality shortfalls, for example, can often add recurring annual costs that far exceed the perceived savings of the "free" license. Additionally, there is a perception that if the module is already part of an integrated solution, then the implementation will be simple and costs will be contained. There is new research indicates that there are no

documented results to support this view, "…this comparative long-term TCO reduction has never been validated empirically for any enterprise resource planning (ERP) vendor and remains theoretical at this point (Gartner Group, May 2003)."

As an aid to evaluating vendors in this area, consider the following questions:

- What are the costs involved that go beyond license fees?
- What specific ROI is each function going to generate, and therefore:
- What is the overall impact on total ROI as a result of missing functions, or what are the ongoing costs of work-arounds to compensate for functional gaps?
- What are the hidden integration costs associated with the solution's supported methods for interfacing with trading partners or other disparate applications?

3. Functionality Fit

Functionality is a key component of a successful implementation. The functionality of the solution you choose MUST meet or exceed the requirements stated in your business strategy. Additionally, in today's dynamic business environment, your ability to quickly and cost-effectively adapt the solution to your changing requirements and upgrade to the latest version are equally essential. Talk to your vendor about their upgrade process to ensure that you can take full advantage of their latest functionality enhancements without excessive time and cost.

As previously discussed, business strategies are typically translated into a series of key performance indicators (KPIs). These KPIs are then used to measure the performance of each department. If the functionality is not present to effectively pick, pack and ship a customer's complete order on time via the required shipping method to the correct destination, then how can KPIs associated with customer satisfaction be met? If excessive work-arounds are required to make the functionality fit your business requirements, how can labor utilization KPIs be met? If the solution is weak in terms of inventory management and control, how can KPIs for inventory cost and turn-times be met? Hence, functionality is the key to delivering the results required by your business strategy; it is the key to a successful implementation.

Many organizations utilize detailed functionality checklists to assess the functional fit of an application. While a valuable approach overall, there can be confusion between you and the vendor over the terminology used to explain functionality. Furthermore, vendors often look at these checklists as an obstacle that needs to be overcome so they are not eliminated from further consideration in the search process. Because this can lead vendors to over represent their capabilities, you should ask for demonstrations of key functionality you require.

Most ERP warehouse modules force significant operational compromises in dealing with larger, more complex operations. Besides limited functionality and adaptability, the transaction-oriented ancestry common in these modules also creates limitations in complex warehouse operations where real-time direction and management of activities are a must. Although it is true that these transactions are updated as they occur, the presumed sequence in which these transactions are executed is typically not consistent with real-world activities in the warehouse. A real-time execution paradigm for the warehouse floor is foreign to the architectural foundation of most ERP offerings.

For example, a WMS tracks exactly where each element/load of inventory is located in the warehouse, including material that has been received but not put away. Typically, this material is not available to fill orders. In many ERP-related systems, once a receiving document is completed, the inventory is available for picking even though it has not been put away. The transaction is complete, but the warehouse process is not ready to use this material for order fulfillment.

However, these types of limitations do not mean that there is no place for ERP warehouse modules. Many warehouses have smaller, less complex operations, even in major multinational corporations. In those situations, where the warehouse is small or simple and the value proposition for a third-party WMS installation is problematic, the ERP warehouse module should be considered.

To determine if your ERP module can match the best practice capabilities of most best-of-breed WMS solutions, ask these questions:

- Does the ERP warehouse module offer native RF device capability or are all work tasks paper-based?
- Does the ERP warehouse module support real-time task interleaving?
- Does the ERP warehouse module offer individual load/inventory incidence license plating?
- Does the ERP warehouse module offer wave planning?
- Does the ERP warehouse module track a SKU stored in multiple locations within a warehouse (e.g., all stock in one forward pick location and one reserve location)?
- Does the ERP warehouse module support compliance labeling or special formatting for the paperwork involved in shipping?
- Does the ERP warehouse module support value-added activities such as kitting, packing stations and special packaging instructions?

The real point being made here about functionality is not the vendor's ability to claim that they have a particular feature. The point is more about how that feature is used in the warehouse. Does it relate to or fit how your warehouse operates? Is it tied into the ERP's transactional view (typically a financial transaction view), thus becoming cumbersome during execution within the warehouse?

A major point of difference between the best-of-breed WMS and ERP worlds is how they model the processes being executed in the real world within their applications. The solution's model of the world and the fit with your operational world will drive whether the solution is seamless or incompatible. The completeness of this fit between two worlds and the ability of the software solution to adapt to the changes in the operational world are critical success factors for the implementation. This is where the typical financial transaction view of an ERP clashes with the operational realities of a real warehouse operation, regardless of its size. This is also where most best-of-breed WMS applications, with their in-depth domain expertise, can add real value to your business in the form of measurable results. Ultimately, this should drive your decision.

4. Vendor Focus on Supply Chain Solutions

Understanding the vendor's domain expertise and commitment to warehousing and logistics is an important element in this decision process. An overall commitment to the industry is essential and can be evidenced by membership and active participation in professional organizations focused on education and continual product improvement.

Vendors should demonstrate dedication not only to an industry vertical but also to a "horizontal" discipline. From a warehousing operations perspective, the contents of the box, case or container are not as important as how the box, case or container is handled. The fact that material is received into a warehouse as boxes on a pallet and shipped as eaches being picked from the boxes and packed with other eaches into a shipping carton is more important than the fact that the contents are pieces of clothing, electronic components, automotive parts or bottles of pharmaceuticals.

An extension of understanding the vendor's commitment to warehousing and logistics is to understand what part of their corporate vision is made up of the product vision for this area (do they put their money where their mouth is). Historically,

when ERP companies sensed a drop in the revenues from sales of their traditional, core products, they invested in other areas such as advanced planning and scheduling and customer requirements planning. These additions then became focal areas simply until the next new revenue stream came along.

One example of this is an ERP company that has not produced a new version of its warehouse application in more than two years. Its focus and R&D dollars have been directed elsewhere. For a best-of-breed vendor, the warehousing and logistics industry represents their focal area and is a strong indicator of their commitment. Best-of-breed vendors tend to invest heavily in R&D and support programs that strengthen their solution offering. The point in this comparison is to understand whether your selected vendor is truly committed to developing the type of software applications that will support your needs both now and in the future.

As an aid to evaluating vendors in this area, consider the following questions:

- Does the vendor attend industry conferences and trade shows?
- Does the vendor speak at industry conferences or other professional gatherings (university seminars)?
- Does the vendor publish articles to further develop its industry?
- Does the vendor offer valuable "horizontal" domain expertise (WMS or TMS)?
- Does the vendor understand your industry's logistics and execution requirements?
- Does the staff representing the package have deep knowledge of it?
- Is the vendor devoting resources to developing the product, or is this just a new focus during a down market?
- Is the vendor chasing dollars where they're hanging lowest at the moment?
- Is this product area the #1 focus of the vendor?
- What percentage and total volume of their business comes from WMS?
- How many customers are live and deriving benefits in a similar environment?
- What breakthrough concepts can they claim to have delivered?
- How knowledgeable are their implementation and pre-sales teams?
- Do they have implementation plans designed to meet the operational realities of a warehouse environment?
- How do they measure results achieved?

5. Company Culture

When choosing a product critical to the success of your business, it is necessary to view the vendor as a partner, and not simply as a vendor making a one-time sale. The reason for this is simple: 40 percent of system implementations experience some type of failure. The best way to avoid this is to establish a two-way partnership with your vendor so that all potential problem areas can be defined at the appropriate time and resolved before your operations—and therefore your customer relationships and competitive advantage—are put in jeopardy. As the demands of your customers change over time, it is important for you that the vendor will meet your expectations of responsiveness in terms of the new technology, support and assistance with modifications you may require.

Ultimately, your company culture must be compatible with that of your vendor for any effective dialogue and collaboration to occur. Culture is driven as much by size as by common values. You need to understand the vendor's stated values and then conduct reference checks with the vendor's clients to learn whether these values are evident during projects.

As an aid to evaluating vendors in this area, consider the following questions:

- Does the vendor have strong domain expertise?
- What is their understanding of the nature of the problem?
- Have they dealt with the realities of exceptions on the floor and how to handle them?
- Is there a disparity in size between your company and the ERP vendor that could lead to your not getting the attention you require on an ongoing basis?
- Is the vendor able to adapt the software to match your strategic needs where it makes sense? Or do they claim that you should change your business to fit the software?
- Is there a sense of mutual understanding of the domain problem that needs to be solved by the vendor's product?
- What do the references say about how the vendor conducts itself during the sales cycle, implementation and ongoing maintenance?

6. Infrastructure and Architecture

The technological capability of your internal resources cannot be ignored in this decision process. A broad skill set can more easily support a best-of-breed implementation alongside the ERP. If technology skills are more limited, it will be simpler if your organization only has the ERP to manage.

In some organizations, the ability of either type of system to interact with other applications you or your trading partners have already implemented (e.g., TMS, small parcel freight rating, yard management, CRM, etc.) may be the more pressing infrastructure consideration. In such cases, the capabilities of most ERPs will be limited when compared with best-of-breed solutions. Best-of-breed WMS applications have always had to interface with other business applications (including ERPs) as well as communicate with trading partners via EDI or other electronic means.

The essential struggle here is driven by your decision either to address your application needs with a single monolithic infrastructure from one vendor (the ERP) or to have a portfolio of solutions to meet your unique needs. The monolithic architecture approach relies on a single vendor to solve these integration problems (*Consolidated Order Management—ERP Alone Doesn't Deliver*, by AMR Research). The motivation within an IT organization to choose this approach is quite simple; integrating disparate business applications is hard, dirty and detailed work, and the risk of failure is high (as has been seen in many well-publicized failures). The single vendor approach presumes that the vendor has actually done the integration. Yet, this is not always true. It is imperative that you ask the vendor to prove this assertion.

In most organizations, the ERP functions as a replacement for a legacy financial and/or order management application. It may also be true that your organization has more than one ERP that must be addressed in any discussion of architecture (this is typically true in a company that has grown through acquisition). This should not be reason enough to force you toward the monolithic ERP approach. For the ERP to be the right infrastructure choice, it must have the ability to interact/integrate effectively with all of the applications you or your trading partners have already installed.

The architecture of an ERP typically solves integration with other modules using a proprietary approach that often leads to a limited set of external interface definitions. Trading partners must comply with these definitions. This application compliance requirement can be solved through the use of an EDI middleware product or the introduction of an EAI middleware solution. Best-of-breed WMS solutions tend to be more flexible in how they integrate with the applications of the outside world. Remember that for them, integration with disparate applications has always been a requirement. The maturity of their architectures usually leads to existing interfaces to major ERP solutions (e.g., SAP, J.D. Edwards and Oracle) with similar

approaches available for integration with the applications of trading partners by multiple means (e.g., EAI, EDI, XML, Web services and flat files).

For the ERP to be the infrastructure choice, serious consideration needs to be given to how it solves this complicated integration problem. But the ability to accomplish this is not an automatic "win" for the ERP. In fact, any application that works effectively with today's EAI tools is going to be more flexible to accommodate a variety of standards and other applications than any one ERP solution will be able to do on its own.

Many warehouse operations, especially those with high-volume pick, pack and ship requirements, include sophisticated automatic material handling equipment. This equipment might include conveyors, sorters, carousels, A-frame picking systems, pick-to-light systems, etc. Most best-of-breed WMS solution vendors have extensive experience integrating their solutions with these devices. This level of complexity is typically handled by third-party solutions when an ERP warehouse module is used.

As an aid to evaluating vendors in this area, consider the following questions:

- What are the ERP's methods for integrating with their other modules?
- What are the ERP's methods for integrating with disparate applications, including those employed by your trading partners?
- How well does the best-of-breed WMS integrate with disparate applications, including those employed by your trading partners?
- What skill sets does your company bring to the table versus those that can or must be outsourced from the vendor or a third-party integrator?
- Is the vendor compliant with multiple integration standards or do they force others to comply with their APIs?
- Does an EAI tool figure into the vendor's integration strategies now or will it in the future?
- Is there automatic material handling equipment that needs to be a part of an integrated solution?

7. Product Composition and Maturity
Product composition and maturity address the viability of the solution beyond a strict analysis of its functionality.

Composition
Composition deals with how the product is constructed. Is the technology sound? Does it provide for growth of the functions included and the addition of new functions quickly and cost-effectively without significant limitations to how that growth occurs? Will it handle a growing number of daily transactions as your business grows? If the vendor does not devote the appropriate attention to each of these areas, they are essentially shortening the useful life of the solution.

IT departments often seek applications with a composition that matches their own decisions for application development architectures within the company's portfolio. The pitfall here is that the IT department will choose what it is comfortable with because that is what represents the best match with existing skills. However, choosing a packaged solution in today's world does not mean that the IT department has to learn all the new technologies and product idiosyncrasies. The vendor and the associated support and maintenance agreements can provide this support on an outsourced basis, which often represents a significant savings compared to internal IT department costs.

Product Maturity
Product maturity is the outcome of the number of times the product has been "battle tested" by end-users, which results in the breadth and depth of industry-required features in the product. This only comes over time through a number of implementations

in specific markets with varied business processes. For many ERPs, their warehousing modules are new additions with adequate functionality for less complex ways of performing warehousing activities. For other ERPs, the warehousing product has been available for years but is still functionally immature. It has been the victim of a lack of focus and the investment required to develop it in a timely manner. Many of the best-of-breed solutions might have multiple ways to solve a particular functional requirement while the ERP module simply has one.

The Next Level of Maturity
One indication of product maturity and architecture is how the application supports supply chain visibility. This includes the solution's ability to support your knowledge—or your customers' knowledge—of the status and whereabouts of all transactions at any moment. Supply chain visibility makes access to the following possible:

- The status of an order
- A vendor's status on a PO that is urgently needed for manufacturing
- The customer service representative's query about inventory availability
- The status, for example, of a pick-up in Asia and whether it will make it to the boat on time

This capability is not just a new feature to hype to prospects. The geographic breadth of many companies' supply chains brings with it the complexity of always knowing the whereabouts of orders, shipments and inventories. The added demand for rapid response to customer requirements and the necessity of delivering on promises have raised the level of minimally acceptable performance. Any vendor—ERP or best-of-breed WMS—that is not reaching for these capabilities within their product suite, will not be in a position to provide you with these capabilities when you need them most. This will adversely affect your standing in the marketplace and reduce both customer satisfaction and your ability to differentiate your offering from the competition.

ERPs believe that supply chain visibility is or will soon be the domain of the large ERP vendors. This view is too bullish in that it ignores the general lack of supply chain execution domain expertise within the ERP vendor organizations (warehousing, transportation, logistics, etc.). This lack of comprehension of the domain limits the ability of the ERP vendors to understand how to best construct event notification, visibility and drill-down analysis functions within their products. Only those vendors with an understanding of the true value of supply chain execution have taken their applications beyond four-wall control of the warehouse. Best-of-breed WMS vendors that have worked with EAI tools to build their visibility capability have both the technology platform and the domain expertise to be effective.

As an aid to evaluating vendors in this area, consider the following questions:

- Does the vendor's technology limit the growth or scalability of their solution?
- Is the vendor's solution thinking ahead to provide visibility and event notification across the supply chain?
- Does the vendor have the domain expertise to understand how visibility works across a supply chain execution scenario?
- Does the vendor's solution offer multiple methods to solve a specific execution problem, or does it have a simpler, yet more rigid methodology?

8. Implementation and Ongoing Support
Implementing an ERP module is not necessarily less expensive than implementing a best-of-breed WMS. Recent research by Gartner Group involving multiple case studies of ERP modules versus WMS implementations has shown that there is no factual support for this belief (*SAP WMS Will Become a Contender in 2005*, by Gartner Group, May 2003). What has been learned is that implementing either solution requires the support of a knowledgeable staff. It is essential to the success of the implementation that a complete plan be developed—one that includes configuration, hardware implementation, modification

development (if needed), testing, conversion support and on-site user training. The development and execution of this plan requires experienced leadership and the support of top management. Many organizations rely on integrators or consultants to provide this skill for the limited duration that it is required. This is appropriate with either option being considered.

A key implementation consideration is whether the vendor has a support staff available to assist you with the implementation of their solution—and whether this staff is knowledgeable both of the product and your industry domain. Ongoing support deals with the ability to perform back-ups on a moment's notice, implement changes as needed, and manage the change process—be it code, supporting applications or configuration changes. ERPs with a centralized data model tend to require off-line time to execute many of these functions, whereas best-of-breed WMS vendors have developed techniques that allow these functions to be performed on an as-needed basis.

If either the vendor or your organization lacks the necessary skills, then it may be appropriate to seek a third-party integration consultant. This adds another selection process to the project in that the skills and fit of the third-party system integrator must be evaluated along lines similar to those used in selecting the solution vendor. This may add cost to the project as a whole and often delays the selection process. It may also prolong and dilute ROI. The real issue is whether you will receive a generic, low-value implementation or a high-value one based upon domain expertise and proven warehouse-specific implementation and performance improvement processes.

Specific questions to consider:

- Which solution really offers the greatest speed or least complexity of implementation?
- How does TCO for implementation, maintenance and upgrades compare between the two solutions?
- Does either solution permit back-ups online, or do they require downtime?
- What are the downtime requirements for database reorganization?
- Is your business prepared for a single point of failure?
- What is the uptime impact of a centralized versus decentralization WMS solution?
- Does the vendor rely on, or recommend that you rely on, third-party integrators for implementation staffing?

9. Conclusion

Maximizing business results is the ultimate objective of a warehouse management system selection and implementation, and you cannot get there if the solution chosen lacks the functionality required to meet your stated KPI goals. If you don't have a solid definition of your requirements and how they contribute to maximizing your success, you will not succeed. All of the other factors involved with choosing a solution are valid and important but must be subordinate to the focus of maximizing business results and ultimately, the long-term success of your business. If your customers do not get what they want, when they want it, the way they want it, for a price they are willing to pay, they will remember nothing else.

Choosing a best-of-breed WMS or an ERP warehousing module to meet these needs is not a simple exercise; it is critical to your business' success in the market place. You need to define these requirements carefully with consideration for the future, not just the here and now. You need to evaluate all options against the same criteria and then compare the results. Considering total cost of ownership and your ability to accommodate new and changing business and customer requirements is critical. You must challenge the vendors you evaluate to prove the true capabilities of their solutions—before you purchase. This decision is something that will impact your business, your operations and your customers for years to come. The value in the solution is in meeting your business requirements cost-effectively, with room for the future—not saving money on a solution that ultimately doesn't protect your long-term competitive advantage or produce low total cost of ownership.

About HighJump Software, a 3M Company

HighJump Software, a 3M company, is the global leader in providing highly adaptable, best-of-breed supply chain execution solutions that streamline manufacturing and distribution from the point of source through consumption. HighJump's tightly integrated solutions empower operational excellence in the warehouse and optimize the flow of inventory throughout the supply chain by facilitating collaboration with customers, suppliers and trading partners. These comprehensive solutions combine robust, standard functionality, a best practices-based implementation methodology, and a uniquely adaptable architecture that facilitates fast, cost-effective system modifications. The result: the industry's lowest total cost of ownership for more than 700 satisfied customers worldwide. As an independent subsidiary in the 3M family of companies, HighJump leads the supply chain execution software industry in financial strength and delivers on an unmatched commitment to innovation and quality. HighJump leverages these advantages to continually expand its solution footprint and empower operational excellence for domestic and multinational customers.

About TKR Consulting Associates

TKR Consulting Associates is a firm committed to improving the efficiency of companies' supply chain execution operations. We do this by applying dedicated, experienced resources to solve operations and technology problems.

We will analyze the issues, design the solutions, qualify the technologies and help you implement those solutions. We accomplish this through mature, experienced professionals.

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