Tales of Disparate Systems: Lessons Learned from Microsoft Dynamics AX Users

This paper explores several case studies to investigate common issues found at equipment manufacturing firms working with disparate business information systems. Reflecting on issues identified by these firms with their legacy systems, we will examine the benefits these companies have enjoyed after replacing those disparate systems with a single, unified Microsoft Dynamics enterprise resource planning (ERP) solution.

Ball of Confusion

A ball of confusion is what the world is today, at least if you work for an equipment manufacturing company trying to cope with disparate business systems. For those who may not have bumped into the term “disparate” before, the Merriam-Webster Dictionary defines it as:

“Containing or made up of fundamentally different and often incongruous elements; markedly distinct in quality or character.”

Applied to the world of information technology, disparate business systems are a collection of various code sets, applications, databases, systems, technologies and reporting constructs that do not interact with each other in a congruous manner. Organizations saddled with disparate systems often find themselves trying to manage in an environment where company data is disconnected, discordant, impenetrable and hard to manage.

Given its inherent capabilities to support project-based engineer-to-order (ETO), configure-to-order (CTO), and make-to-order (MTO) business processes and its tight alignment with the information technologies offered by Microsoft, the Microsoft Dynamics AX ERP solution enjoys a considerable following in the equipment manufacturing industry worldwide. Since Microsoft Dynamics AX has been selected as a replacement solution by so many organizations in the equipment manufacturing industry and its adjacent supply chain, it can be very beneficial to learn about the challenging issues which drove these companies to the deployment of a new ERP solution. We carefully reviewed the studies involving the following companies and their struggles with disparate business systems prior to their implementation of Microsoft Dynamics AX:

- **Aliaxis Group**: A leading global manufacturer and distributor of primarily plastic fluid handling systems used in residential and commercial construction, as well as in industrial and public infrastructure applications
- **Flow International Corp.**: A leading manufacturer of ultra high-pressure waterjet technologies used in a host of industrial applications, from stripping paint off ships to precisely cutting thick metal or stone
Haldex North America: A manufacturer of brake systems for heavy trucks, trailers and buses

MDC Vacuum Products: Manufactures a broad range of standardized high and ultra-high vacuum components, as well as custom engineered solutions for both science and industrial vacuum applications and gas delivery

Polytech Products Inc.: A Calgary, Alberta-based manufacturing company specializing in products for the hydronic heating and potable water distribution industry

Sevcon, Inc.: Manufactures high-quality motor controllers and system components for electric vehicles

The Greenbrier Companies: A leading supplier of transportation equipment and services to the railroad industry

Wheelabrator Group: The world leader in surface preparation technology, offering a complete range of airblast, wheelblast and mass finishing solutions

Some of the most common complaints voiced by these equipment manufacturers came from their prior experiences with a disparate systems environment, including:

- Integrations between heterogeneous IT system elements were costly to design, develop and maintain.
- Custom integrations were fragile and prone to error or complete failure.
- Multiple system overlaps in many areas forced key pieces of data to be duplicated among those systems. The maintenance of duplicated data in each related system was burdensome on available resources and created many opportunities for discrepancies and errors to enter the information stream.
- Lack of a single cohesive data set that accurately represented the reality of the business created a need for many workarounds to the system and required manual human interfaces to bridge between disconnected system elements.
- Obtaining harmonized information that provided a reliable and cohesive view into the business, its operations and its performance was difficult. The result was a general distrust of the system, forcing users to constantly scrub data and double-check information outputs for validity.
- Constructing and using a single view of the customer experience was difficult. The result was inconsistent and often times conflicting information about where things stood with a customer and what the business history with that customer had been.
- Constructing and analyzing a true picture of product costs was difficult. This impacted multiple areas of management as well as hindered efforts at producing timely and competitive bids for new sales opportunities. Without a solid understanding of underlying costs, probabilities of quoting new opportunities that would lose the company money in the long run were unacceptably high.
- Disconnects between the selling, invoicing and accounting portions of the business created issues in producing correct and timely invoices for customers. It also hampered efforts to gather information to use in collecting on overdue invoices when required.
- Engineering and deploying management metrics across the organization was challenging. Most metrics were trapped in silos tied to the individual software applications that were supporting those silos.
Creating an environment that fostered and promoted a reliance on “tribal knowledge.” Individual knowledge brokers were championed as being the best way to get things done.

Training employees on disparate system elements was costly, especially when moving personnel between operating groups and locations.

Challenges were encountered in using the system to help architect and maintain business workflows that supported a value chain from beginning to end. Instead, processes moving between organizational silos required extensive human intervention acting as a data buffer at the process flow hand-off points.

Ability of the business to create efficient and effective integrated information flows with customers, partners and suppliers was hindered. Since the business system was inadequate to the task, this activity fell back on information exchanges using Excel spreadsheets and similar as the communications medium. Using Excel as a collaboration tool required information to be painstakingly assembled, cleansed and distributed to necessary audiences. Since different parties wound up looking at different versions of a spreadsheet from different points in time, the ability to truly collaborate was still unacceptable.

Financial period closing and reporting was labor intensive to complete and took far too long to accomplish. Delays in access to timely data limited its usefulness as a tool to be used proactively in running the business.

For all the above reasons and more, a disparate systems environment limited productivity and hindered effective collaboration and business management, resulting in reduced competitive capabilities for the organization.

For obvious reasons, the phrase “disparate systems” conjures a negative response with most business professionals today. However, an adjacent term such as “best-of-breed systems” evokes a positive response in many circles. Both of these terms point to an information technology environment comprised of multiple heterogeneous applications and data sets being used to run a business, so why the difference of opinion between the two? At the most basic of levels, the answer is based on the plumbing being used.

Among equipment firms suffering from an information technology ecosystem characterized as disparate, information interchange problems most commonly arise with:

- The information conduits used to connect the individual nodes of a system are not sufficient to handle the integration needs of the business,
- The end-nodes of the system do not offer adequate capabilities to fully connect to the conduits,
- The data being moved between system end-nodes cannot be adequately transformed and harmonized without human intervention, or
- The organization is lacking in resources and/or funding to construct and maintain the plumbing.
Depending on the age of the technologies involved, the usual underlying causal factor for connectivity issues in these environments is a constraint in available resources and funding to be applied to the problem. As an example, a study of enterprise information system integrations conducted by The Yankee Group found that on average most firms will spend six times as much on resources and expenses to setup and maintain a software integration solution as the integration toolkits themselves will cost (1). This situation can be compounded if the functionality offered by the applications, databases, etc. sitting at the end-nodes is not robust enough to fully meet the needs of system users. Other contributing factors may include the inflexibility of these systems or even their excessive fragility.

While concerns with disparate systems have been around for years, the story surrounding best-of-breed-based business information systems has recently changed. Several emerging forces have brought a best-of-breed approach back into the spotlight, including:

- Availability of new applications and technologies such as Web Services and Service Oriented Architecture (SOA), which are much more conducive to use in an integrated environment
- Emergence of new cloud-based technology delivery options such as IaaS, SaaS and PaaS (Infrastructure as a Service, Software as a Service and Platform as a Service, respectively) in public or private clouds
- Release of new business process and workflow management tools that are able to span multiple applications, and in some cases, even multiple underlying technologies

A study conducted by Jones and Young that was reported in the November 2006 edition of the Information Resources Management Journal found that 18 percent of business firms pursuing a new ERP solution were considering a best-of-breed solution approach (2). However, while a best-of-breed approach is once again getting some attention when it comes to ERP solutions in general, this re-emergence of best-of-breed possibilities has also been at least partially offset by other developments in the marketplace, such as:

- The functional footprint offered by major ERP solution providers (either organically or through acquisition) has expanded to include many areas formerly reserved for best-of-breed applications.
- The ability of all solution developers in the best-of-breed solutions category to fully avail themselves of modern infrastructure and integration technologies alternatives remains highly fragmented.
- The ERP solution providers themselves are aggressively pursuing industry-leading technologies to make their products more flexible, allowing them to be adapted to the needs of their customers much more easily than monolithic ERP systems of the past.
- Most major ERP solutions in the equipment manufacturing space today are also now being reinforced by products developed by third parties in the primary solution publisher’s ecosystem. These third-party solutions extend the publisher’s core ERP offering in specific areas that could be of interest to an equipment manufacturer. In many cases, these solution offerings are written directly into the core ERP solution, negating the need for custom integrations.

Given the capabilities of currently available commercial ERP solutions, it is clear why such a small fraction of companies are actively considering a best-of-breed approach to meeting their business system needs at present.
I Can See Clearly Now

Having reviewed some of the issues reported by our sample population, let’s now investigate the benefits that these companies are enjoying after replacing their disparate systems environment with Microsoft Dynamics AX.

At the top of the list, the most common benefit mentioned among our study group of companies was cost savings. The sources for these reported cost savings included:

- Lower Total Cost of Ownership (TCO) for their new Microsoft Dynamics AX solution as compared to the former disparate systems-based environment
- Lower IT administration costs made possible by standardizing on a single Microsoft technologies platform
- Lower operational costs derived from increased information visibility, ease of collaboration and personal productivity afforded by Microsoft Dynamics AX
- Improved productivity allowed additional business volume to be absorbed without increasing employee headcount
- Elimination of information being duplicated across multiple systems reduced non-value adding data extraction, cleansing and re-entry activities
- Reduction in inventory levels enabled by improved planning and control capabilities of the new ERP system which resulted in an increase in free capital made available for investment in other business initiatives
- Reduced costs associated with the elimination of expediting activities
- Improved utilization of plant assets made possible by improved capacity management capabilities of their new system
- Standardization of business processes reduced costs associated with training and retraining employees as they moved between company operations and the disparate systems being used in each departmental area
- Reduced costs to maintain compliance with audits and reporting mandates required under the Sarbanes Oxley Act

While all of these reported sources of cost savings are desirable in their own right, some offer the possibility of extended benefits. For instance, a reduction in inventories post-deployment of a new ERP solution provides an immediate source of cash flow to the business. However, this is a one-time event. In the case of several other reported improvements, such as an increase in personnel productivity or a reduction in IT administration costs, these benefits can provide a ripple effect when those resources are made available to activities with a greater value-add to the organization.

As an example, according to the information technology research organization Gartner, Inc., the percent of budgeted spend by industrial manufacturing companies on information technology used to either grow or transform the business in 2010 was 30 percent. The remaining 70 percent was earmarked for use in system upkeep and maintenance chores required to run the business on a day-to-day basis(3). When a company reports that they were able to reduce costs incurred in
IT administration, one of the secondary benefits of that initial cost reduction could be an increase in the investments available to truly transform the business through the application of information technologies.

All by itself, the cost savings reported by these companies after they completed their move from a disparate systems environment to Microsoft Dynamics AX makes for a compelling story. However, this was certainly not the only benefit being accorded to an investment in this Microsoft ERP product. Some of the other positive outcomes reported by these companies included:

**CFO Role Center in Microsoft Dynamics AX 2012**
- Ease of access to meaningful and transparent information has provided a better environment for informed decision-making at all levels of management.
- The multi-entity and multi-lingual aspects of Microsoft Dynamics AX support users across the global organization from a single application running on a single database, gave users access to exactly the same data but presented in a context that was most meaningful to each individual.

**Supply Schedule in Microsoft Dynamics AX 2012**
- Better visibility into inventory positions and allocations across all company locations provided for improved order promising and on-time delivery performance with customers.
- More robust and complete view of transactional activities with customers provided better insight into emerging trends in the marketplace.
- Enhanced pricing matrices and control over pricing deviations and supporting approval workflows has yielded improved profitability on equipment sales.

**Product Cost Versioning in Microsoft Dynamics AX 2012**
- Improved revenue capture derived from integrated sales to invoice processing that also supported enhanced customer accounts receivable analytics.
- Much improved support for internal project budgeting and planning functions supported by better project analytics.
- Significant downsizing of the Chart of Accounts and improved financial processes and information allowed period closing times to be reduced dramatically.
Graphical Workflow Design in Microsoft Dynamics AX 2012

- Vastly better ad hoc reporting available to employees with native integration of Excel with the single, unified SQL database working under the Microsoft Dynamics AX application.
- Augmented ability to exchange consistent, real-time information with customers and suppliers/partners has reduced lead times, improved supply chain performance and made the whole environment more agile and responsive to marketplace demands.

In summary, replacing an existing information technology environment comprised of disparate, disconnected elements with Microsoft Dynamics AX has proven to be a worthwhile investment for our study group of equipment manufacturing companies. If your organization is currently struggling with a disparate business systems environment, a similar transition to Microsoft Dynamics AX may be the right answer.

If you would like to learn more, we invite you to review additional information offered on our website at: http://www.sikich.com/equipment-manufacturing.


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