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Garbage In, Garbage Out: Getting Good Data Out of Your BI Systems

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Introduction

Recently, a big topic in BI has been the importance of "data quality" – in essence, cleaning up the data that is presented to the data warehouse so that the errors, inconsistencies, and so on are eliminated as much as possible. What many users do not realize is that this is just a part of a larger problem: How do you get the most out of the business-relevant data floating around, inside and outside the organization? As it happens, I performed a survey and study on the subject last year.

Analysis

What does this study recommend? The short answer is, you should start thinking of your organization as being in the business of gathering data, turning it into information, and using that information as effectively as possible. In other words, you think of your organization as trying to get as much high-quality, potentially useful information to your BI solution as possible, and then analyzing that information, followed by using that analysis to make decisions as rapidly as possible. Then you try to develop a set of metrics that will tell you how well you are doing, and what are the weak points in the process.

This set of metrics measure what I call data usefulness. I define data usefulness as the ability to deliver all needed accurate, consistent, and appropriate data to the right user in a timely fashion. My survey in the study convinces me that there are significant and growing problems at every point in the process of converting data into useful information. Table 1 shows my take on the typical steps in the data-delivery process, the metrics by which the effectiveness of each step should be judged, and the problems that many are seeing today at each step. The key take-away point is that fixes to one or two steps will not in the long run fix the overall data-usefulness problem. Rather, organizations of all sizes need to take a comprehensive, long-term approach to ensuring data usefulness.

The Data Delivery Cycle

Step	Metric	Example	Problem
Data entry	Accuracy	Percent of data items with errors	Majority of businesses report more than 15% of items with errors
Data consolidation	Consistency	Number of data items with multiple records and no master record	Majority of businesses report more than half their data inconsistent
Data aggregation	Scope	Percent of data sources on which a cross-data-source query can be performed	Majority of businesses report they can't do cross-database query on more than 2/3 of company data
Information targeting	Fit	Percent of time data delivered that is not appropriate to end user	Majority of businesses report more than 60% of the time, data delivered to executives inappropriate
Information delivery	Timeliness	Time taken to deliver (entry to arrival on screen) to average user	Majority of businesses report a week or more average time to deliver
Information analysis	Analyzability	Percent of time user can't immediately do online analysis of data received	Majority of businesses report can't do immediate online analysis more than ½ the time
Process adjustment	Agility	Percent of new outside data sources not available within 1/2 year	Majority of businesses report more than ¾ of relevant new Web information not made available inside the company within ½ year

The Data Delivery Cycle also shows that, by users' own estimation, more than 2/3 of the data that flows into the organization is not used effectively. In fact, if you include the inability to flow new sources of data into BI, more than ¾ of the useful data out there never gets used right.

Conclusion

There is a great deal of more in this study about how to tackle particular parts of the problem, what vendor products and solutions deliver the biggest bang for the buck, and how to monitor the process – material that is far too long to cover here. However, users can take certain steps immediately, without knowing that much about data usefulness.

Those steps are:

1) If your company now includes 2 or more (usually acquired) organizations whose operational data is at least partially kept separately, put an EII (Enterprise Information Integration) or "data virtualization" tool in front of your BI, so you can query both sets of data at once. Examples: Composite Software, IBM Information Server.
2) Get a dashboard BI add-on for senior executives, so that you can fine-tune the relevance of the information presented to them, and perhaps be able to display more current information than standard BI reporting tools. Examples: BI solution vendors such as SAP Business Objects and Microstrategy.
3) Make sure you have an Excel option for your BI solution, so useful information can be delivered as spreadsheets as well as hard copy. Examples: Oracle OLAP Option and 1010data.

One caution: today as in the past, the first reaction to problems with data usefulness is to attempt to put everything to do with data in the BI organization, and all data in the BI data store. Experience has shown that this never, or only temporarily, works. There's just too much data floating around out there, and more new types of data coming all the time. Improving the quality of data coming into the BI solution is one thing; attempting to force everyone to enter all data into the BI solution is quite another. Don't waste your time and money on the latter.

Disclosures and References

Data Delivery Cycle source: Infostructure Associates, March 2009

Recommended Reading

- Business Intelligence: 5 Things to Watch for in 2010
- Top 5 Business Intelligence Considerations for Enterprises
- Raising your 'BIQ' (Business Intelligence Quotient): 5 Things Your Company Can Do NOW

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Midmarket ERP Solutions Buyer's Guide

Focus Research

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Table of Contents

Executive Summary ..... p. 3

Midmarket ERP Solutions Overview ..... p. 5

Market Overview ..... p. 7

The Benefits of Midmarket ERP Solutions ..... p. 10

Basic Features ..... p. 11

Advanced Features ..... p. 14

Cost ..... p. 15

Checklist ..... p. 16

Conclusion ..... p. 18

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Executive Summary

For all but the smallest organizations, an ERP (Enterprise Resource Planning) system promises big gains, helping to grow revenue, increase productivity companywide, improve efficiency throughout the enterprise and manage costs. ERP integrates a variety of disparate systems, such as financials, SCM (Supply Chain Management) and CRM, automating time-consuming processes and streamlining operations. With a unified view of cross-company information, executives can ultimately make better decisions about corporate objectives and strategies.

Right now, most of the ERP action is happening in the midmarket. More and more midsize companies — which are rather broadly defined as organizations that earn more than $50 million annually in revenue but less than $1 billion — are looking to replace outdated ERP systems or jump into the technology for the first time.

In fact, Boston-based AMR Research says in its "ERP Market Sizing Report, 2006–2011," "in the small and midsize business (SMB) segment, which continues to outgrow the overall market, companies are buying new ERP systems in response to new customer requirements and the desire to participate in the global market."

ERP solutions tailored to the midmarket abound, making it a buyer's market. In this age of mergers and acquisitions, many of these organizations were once small companies, and now, as midmarket organizations, they need to consolidate various software systems and standardize business processes. Most companies in this space are coping with increasingly complex operating environments, aging technology — including outmoded ERP systems — proliferating business-management software and, of course, the need to grow revenue.

Midsize companies also face challenges specific to their industries. According to Aberdeen Group Inc., an IT research firm based in Boston, businesses that make consumer product goods are concerned about regulations and reporting requirements, while public-sector organizations are worried about maintaining customer loyalty. Also, manufacturers are concerned about the commoditization of their products. A robust ERP package can help address these issues, as well.

Late last year, Aberdeen Group released its "2006 ERP in the Midmarket" study, which surveyed more than 500 organizations from a variety of industries. It found that very few midsize companies — just 6 percent — don't already have an ERP or MRP (Material Requirements Planning, the precursor to ERP) implementation. For those businesses, the reasons to take a leap into ERP, which is largely considered necessary infrastructure for midsize companies, are many and compelling. According to Aberdeen Group's "2007 ERP in Manufacturing" report, 650 midsize companies cited the availability of low-cost options; pressure from the parent company, suppliers or customers; "explosive" growth; compliance with regulatory requirements; and a "disastrous event" as factors convincing them of the value of ERP.

At the same time, Aberdeen Group found that many ERP implementations in the midmarket are quite mature and ripe for replacement. In the "2006 ERP in the Midmarket" report, 35 percent of respondents had ERP systems older than 10 years, and 38 percent had ERP systems 5 to 10 years old — and 22 percent of these were the organizations' first ERP systems that supplanted manual processes. ERP technology has evolved significantly in the years since these systems were deployed, so many of these organizations have developed their own applications to make up for inadequacies.

Many midmarket companies must now also choose an ERP system on which to standardize after multiple systems were installed, perhaps through mergers, across the enterprise. Aberdeen Group's 2006 study found that 42 percent of midsize companies had two or more ERP packages, and 16 percent had three or more ERP systems. Although it's not necessary, midsize companies seem to prefer consolidating their business-management applications in one ERP package, at least in part to cut down on integration headaches.

In its "2007 ERP in the Midmarket" survey, Aberdeen Group surveyed respondents about their upgrade and replacement strategies, which is in good part spurred by proliferating ERP systems. In one year, 9 percent plan to replace their ERP package; in two years, 14 percent plan a replacement; and in three years, 25 percent plan a replacement. In addition to consolidating multiple ERP systems, respondents want to replace their ERPs because 46 percent need more functionality than they currently have, 39 percent are unhappy with outdated and clumsy user interfaces, and 37 percent need a standardized solution with international capabilities.

Vendors are aggressively vying for customers, launching new ERP solutions designed to meet needs particular to the midmarket and pricing them to meet a midmarket company's budget. To further entice midmarket customers, vendors are also developing vertical solutions that target certain industries, such as engineering, food and beverage, and fashion, with built-in functionality that cuts down on customization. In an effort to simplify the notoriously difficult implementation process, vendors are also developing ERP systems that can be delivered in ways friendly to organizations with limited IT resources; several now offer hosted solutions, and some are figuring out ways to offer this complex technology on demand.

Factored together, the decreasing costs of hardware, infrastructure technology and ERP software put a modern version of these once-epic business-management packages within reach of any midsize company.

In this Buyer's Guide you will find details on what to look for in a midmarket ERP package, the benefits it should bring to your midsize company and what you need to know before you commit to a solution.

Midmarket ERP Solutions Overview

Although vendors continually add new functionality to their ERP solutions, the technology itself is not new. In fact, some ERP fans date the technology all the way back to 1960, when manufacturers began using the first inventory-management and control systems, which evolved into MRP systems in the 1970s. But ERP as we understand it today didn't emerge until 1990, when vendors like SAP and BAAN Corp. expanded MRP from coordinating manufacturing processes to integrating a variety of back-end processes across the enterprise.

Now, ERP systems are composed of several integrated modules that replace legacy systems, most of which are point solutions that operated solo in their respective departments. Modern ERP systems use a common corporate database to integrate not just multiple departments, but also multiple sites, for a truly companywide view. In this way, ERP gives greater visibility into business processes across the company, including the finance, human resources, manufacturing and marketing departments.

Recently, the greatest change in the ERP market is scaling these complex, expensive systems to make them more accessible to midmarket companies. Vendors have also made ERP solutions easier to use and simpler to implement, as well as reduced the amount of necessary customizations to fit the business, namely by adding features that support certain aspects of businesses that are common to midsize organizations in a given industry. For instance, an ERP system tailored to the fashion industry should use matrices specific to apparel, like sizes, colors and styles. An ERP solution for government organizations should include encumbrance accounting, while an ERP system for manufacturing should include support for environmental regulations.

Vendors are also looking for ways to make the systems more agile so that organizations can more quickly react to changes in the market. At the same time, the many midsize companies that do use ERP need to "derive more and better business value from their ERP implementations," according to Aberdeen Group, which means that they should utilize more than the 45 percent of functionality they current use in their ERP systems.

Even if your organization chooses a vertical solution with out-of-the-box features that support your industry-specific needs, you will face choices about functionality and customization. The time is right during an ERP implementation to standardize business processes across the network — which should make it easier to carefully align your organization's business processes with the ERP software's functionality. Midsize companies in particular should be wary of customizing the software to match business processes. In fact, if you've chosen the right solution, very few modifications should be necessary.

And for most midmarket companies, the features offered by an ERP solution are the key deciding factors in selecting software. In fact, in Aberdeen Group's "2006 ERP in the Midmarket" survey, about 70 percent of respondents cited functionality as the top criteria, followed by total cost of ownership and ease of use.

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Almost every midmarket ERP solution includes the same modules, but the features within those modules can vary greatly depending on the vendor's history and core competencies. For instance, a vendor that rose from the manufacturing-operations software is likely to specialize in the manufacturing and perhaps supply-chain aspects of ERP. In general, an ERP system's core modules are:

- BI (Business Intelligence)
- CRM
- Financial management
- HCM (Human Capital Management)
- Manufacturing operations
- SCM

As vendors expand their offerings, they may also include modules to support lean manufacturing, BPM (Business Process Management), EAM (Enterprise Asset Management), and SRM (Supplier Relationship Management).

The modules that compose an ERP package are barely a drop in the bucket when it comes to understanding what features it offers your organization. Choosing the right solution requires digging deep into its functionality and matching it to your organization's business processes, and ultimately, its corporate strategies and business goals.

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Market Overview

Consolidation among vendors has been the hallmark of the ERP market in recent years, starting among the industry leaders for enterprise-scale ERP — most notable was the hotly-contested acquisition of PeopleSoft Inc. by Oracle, Corp., which also purchased JD Edwards. Taking the giants' lead, midmarket companies are also consolidating. Alpharetta, Ga.-based Infor acquired MAPICS Inc., Geac, SSA Global Technologies Inc. and Hansen Information Technologies. Intentia merged with Lawson Software, which has headquarters in St. Paul, Minn. And Sage Software Inc., which has its division offices scattered across the Unites States, bought Adonix North America and Best Software.

Vendors in this space are also adding functionality to their ERP offerings through acquisitions, rather than developing it internally. Infor again has been particularly busy — the vendor made several supply-chain-focused acquisitions, then bought Datastream for EAM, Formation Systems LLC for product-specifications management, Extensity for performance management and Workbrain for HCM. Irvine, Calif.-based Epicor Software Corp. bought CRS Retail systems to add retail operations to its portfolio of vertical offerings. Santa Barbara, Calif.-based QAD Inc. acquired Precision Software for GTM (Global Trade Management) and Bisgen for SFA (Sales Force Automation) capabilities. Oracle continued its buying spree by purchasing Retek for retail operations and Siebel for CRM. And Microsoft acquired eBECS Ltd. for its lean manufacturing capabilities.

According to AMR Research's "2007 ERP Providers Serving the Midmarket," the ERP market will continue to grow at 18 percent, largely through add-on functionality. Vendors will continue their acquisitions, with the "goal to create product portfolios and be a single source of business applications for their customers and prospects."

Like their customers, most midmarket ERP vendors are global companies with offices around the world. Sage Software's parent company is in Newcastle upon Tyne, England; Lawson has headquarters also in Stockholm, Sweden; and SAP is headquartered in Walldorf, Germany, with offices around the world. Exact Software has headquarters in Delft, the Netherlands, as well as offices in Europe; the Middle East; Asia; Australia; Africa; and North, Central and South Americas. From California, Oracle, NetSuite Inc., QAD and Epicor Software operate across Europe, the Middle East, Africa and Asia.

The space for midmarket ERP offerings is crowded and is getting even more competitive as Oracle and SAP, already dominating the market among large global companies, aim for the midmarket. But it's not an easy fight — several vendors that cater to the midmarket are entrenched, including Infor, Lawson Software, Epicor Software, QAD, Sage Software and Microsoft. According to AMR Research, many midmarket vendors, including Epicor Software, Sage Software and QAD, are cross-selling "back to their installed bases to defend their turfs in specific geographies and sub-industry segments against the downmarket advances of larger vendors."

When it comes to specific offerings for midsize companies, many of these vendors don't stick to just one. Some vendors, such as Epicor Software, work with the customer to determine which vertical solution is the best fit. Others give midsize companies a few different options to start with.

Epicor Software

Since its founding in 1984, Epicor has focused on providing business-management software to midsize and small companies. It has more than 20,000 customers around the world and provides solutions in 33 languages. Midmarket customers choose between Epicor Enterprise, an end-to-end CRM suite with industry-specific solutions, and iScala, which targets the divisions and subsidiaries of large local and regional companies with an end-to-end ERP solution.

Exact Software

Exact Software, also founded in 1984, targets the midmarket with Macola ES, which includes native BPM capabilities; e-Synergy, a Web-based collaboration platform that integrates with the ERP solution; and MAX, which is ERP for small to midsize manufacturers with SQL environments. Exact has 180,000 customers using solutions in 40 languages.

Infor

Infor offers the broadest range of ERP products, some of which are appropriate to the midmarket and tailored to industry subsectors. For instance, Infor ERP TRANS4M is for the automotive industry, and Infor ERP Adage is for the process industries. In addition, this vendor provides industry-specific feature packs for its mass-market products, such as Infor ERP LN. Infor ERP is built on an SOA (service-oriented architecture), so the solutions are flexible and scalable. Infor has 70,000 customers around the world, and its solutions support multiple languages.

Lawson Software

Founded in 1975, Lawson Software has 4,000 customers using its M3 and S3 ERP offerings. M3 is tailored to customers who make, move and maintain products, and S3 targets customers in service industries that staff, source and serve. Cross-industry applications include financials, HCM, BI and asset management. AMR Research said, "Key differentiators of the M3 product are its ability to support mixed-mode manufacturing and supply chain planning, including the integration of production planning with plant asset maintenance requirements, aftermarket service capabilities, and attribute management."

Microsoft

Microsoft's Dynamics (previously called Business Solutions) division offers four different midmarket ERP packages: Dynamics GP, which is a scalable business management solution for growing and midsize companies; Dynamics AX, which provides industry-specific functionality to midsize and larger companies; Dynamics SL, which targets project-driven midsize organizations; and Dynamics NAV, which is suitable for small and midsize organizations. According to AMR Research, Microsoft Dynamics has 105,000 midmarket customers using Dynamics AX, NAV and GP.

NetSuite

Founded in 1998 and headquartered in San Mateo Calif., NetSuite targets growing midmarket business with its Web-based business-management system. The company's NetSuite application includes modules for ERP, CRM, e-commerce, marketing automation and more. NetSuite serves customers across a variety of industries, such as software, finance, education, manufacturing and retail.

Oracle

Oracle continues to offer the PeopleSoft Enterprise and JD Edwards EnterpriseOne suites, as well as Oracle E-Business as its midmarket ERP offerings. PeopleSoft Enterprise is an industry-focused suite of business applications that is suitable for growing companies and government entities. PeopleSoft Enterprise has easy-to-implement modularly, and it offers an unusual breadth of features for the midmarket. JD Edwards EnterpriseOne, an integrated applications suite of ERP software, is also good for growing companies and government entities. JD Edwards was founded in 1977 as an ERP software company, and Oracle continues to offer it in 23 languages and localized versions around the world. All told, AMR Research reports that the vendor has more than 19,000 midmarket ERP customers.

QAD

QAD was founded in 1979 with a focus on providing systems to global manufacturers. The vendor now has 5,500 customers using its Enterprise Applications around the world; the ERP applications are also available in localized versions and support 27 languages.

Sage Software

Sage Software's midmarket offerings are Sage MAS 90 and 200, as well as MAS 500, which are used by 55,000 customers worldwide. MAS 90 and 200 are both modular solutions with a range of accounting and business-management features. MAS 200 simply adds a thin client/server platform to the mix. MAS 500 adds to the financial accounting software BI, order-processing, distribution and manufacturing capabilities.

SAP

Like Oracle, SAP is breaking into the lucrative midmarket with more than one midsize-appropriate offering. SAP currently has more than 24,000 midmarket customers. Its current midmarket offering is Business All-in-One, which includes micro-vertical and industry-specific business processes. All-in-One is based on SAP ERP, one of the enterprise-scale products that plays in the global market. It includes SAP Best Practices, which are preconfigured business scenarios that can guide customers through configuring their business processes for SAP applications.

The Benefits of Midmarket ERP Solutions

An ERP package should provide an organization with a solid foundation, incorporating all of the fundamental aspects of running a business. Expectations run high when an organization deploys an ERP package — if the solution is a good fit for the company, the company stands to gain tremendous cost savings and service improvements across the enterprise. Manual processes are automated, production scheduling is more efficiently managed and inventory is more accurately assessed. Also, business performance can be measured in a much more holistic fashion than ever before. This gives executives real-time visibility into all business processes, enabling them to make better strategic decisions. In short, with the right ERP package, a midmarket company can compete more aggressively in global markets.

An ERP implementation can reduce costs in three primary categories, according to Aberdeen Group's "2007 ERP in the Midmarket" report: inventory costs, manufacturing operating costs and administrative costs. The survey's best-in-class respondents reported a 21 percent decrease in inventory costs, a 17 percent decrease in manufacturing operating costs and a 16 percent decrease in administrative costs. The average respondents' reductions were 11 percent, 8 percent and 9 percent, respectively.

Because an ERP solution has its fingers in all aspects of running a business, its benefits are myriad and go beyond tangible cost reductions. It can improve an organization's customer service and response time when solving issues. It can solve issues of interoperability among multiple manufacturing locations. It can standardize and accelerate manufacturing processes in all of a company's manufacturing sites. It can streamline a manufacturer's order-fulfillment processes. It can facilitate connecting with partners' and suppliers' enterprise systems. ERP can even help an organization maintain compliance with government regulations, from hiring practices to environmental laws.

Case studies done on specific ERP implementations reveal a variety of different business-specific benefits. For instance, Tumi revealed to Aberdeen that by replacing legacy systems with an integrated ERP package, the travel-accessories manufacturer reduced its inventory levels by 30 percent, reduced its warehouse space requirements by 38 percent, improved its month-end close process by five days, reduced its DSO (Days Sales Outstanding) by 44 percent and increased sales by 100 percent without hiring new employees.

Various ERP vendors list on their Web sites several gains made by their customers, including:

- TUFF SHED Inc. increased processing from 60,000 transactions per day to 60,000 transactions per minute and shrank its monthly financial review cycle to 5 days from 15 days with Oracle JD Edwards EnterpriseOne
- TRW Automotive reduced its scheduling time by as much as 75 percent with QAD
- With Microsoft Dynamics GP, the City of Waconia, Minn. can complete its utility-billing process 47 percent faster
- Zurn Plumbing Products estimates that it will save $250,000 to $300,000 per year in ongoing IT expenses with Microsoft Dynamics AX

Basic Features

Comparing midmarket ERP packages is not exactly an apples-to-apples type of exercise. Each vendor wraps its midmarket offering with different functionality, tailored to the needs of the kinds of companies the solution is intended for and based on the vendor's particular areas of expertise. For instance, Epicor Software's Enterprise offering targets the business-services sector, while Infor's various industry-specific solutions are well-suited to discrete and project-based manufacturers. Lawson Software's ERP offering supports asset-intensive industries, such as fashion, and Oracle PeopleSoft Enterprise is good for companies that have complex sourcing needs.

Nevertheless, almost every midmarket ERP suite shares several common modules: BI, CRM, financial management, HCM, manufacturing operations and SCM.

The differences among solutions tend to be quite granular within these modules. Also, even if different packages offer the same feature — say, sales-order management — it might not be bundled in the same module; some vendors include sales-order management in their CRM suites while others package it in their SCM suites.

Key to an ERP package is tight integration between modules, so that all of the core business modules are related. For instance, manufacturing operations are integrated with customer service, logistics and delivery. SAP describes a string of events in its ERP product: "… a new customer order automatically initiates an appropriate warehouse action and product shipments trigger billing processes. Sales, production and purchasing groups work seamlessly together to fulfill critical customer orders and adapt production levels to changes in market demand."

Business Intelligence

One of the newer components of most modern midmarket ERP packages, BI shines a bright light into the heart of a company's performance. In general, an ERP suite's analytics or BI tools allow users to share and analyze the data that the ERP applications collect from across the enterprise from a unified repository. The end result is more informed decision making by everyone from executives to line managers to human-resources professionals to accountants. A variety of automated reporting and analysis tools can help streamline operations, as well as improve an organization's business performance. With greater control and visibility of data across the enterprise, business leaders can better align the company's operations with its overarching strategic goals.

For instance, Epicor's BI suite includes data warehouse, budgeting, and financial- and management-reporting tools, as well as performance dashboards, which present critical metrics in subject-specific, single-page digests. Oracle's analytics tools for the JD Edwards EnterpriseOne ERP applications include customizable data marts, dashboards and different data models to help consolidate business information. The PeopleSoft BI applications give each user relevant information specific to his or her job, including built-in best practices sorted by role, function and industry. Also, QAD's BI tools include data warehousing, templates for predefined reports and KPIs (Key Performance Indicators), and dashboards.

CRM

CRM has long been a core component of any ERP offering, giving manufacturers a way to improve customer service by pulling together tools to fulfill customers' orders, respond to customers' service needs, and often, create marketing campaigns to reach customers.

Most vendors include sales tools to provide customers with sales quotes, process their orders and offer flexible pricing on their products. Another important CRM component is service management, which may arm customer-service agents with scripts for talking to customers, as well as allow them to authorize product returns and search a knowledge base of support information. The third main component is usually marketing, which may include tools to manage campaigns, create sales literature and develop a library of marketing collateral.

Additionally, CRM often has tools for account management, SFA, and opportunity or lead management, as well as self-service tools for customers and an e-commerce storefront builder.

Financial Management

Of all the ERP modules, the financials applications tend to be the most frequently utilized. Across the board, these include general ledger, accounts receivable and accounts payable, billing, and fixed asset management. Because many midmarket companies deploy ERP to support efforts at breaking into global markets, it is imperative that their ERP packages support multiple currencies and languages. as well as regulatory compliance in the U.S. and in foreign countries.

The financial-management applications may also include tools for creating and adhering to budgets, cash-flow management, expense management, risk management and tax management.

HCM

HCM and PeopleSoft provide an excellent example of the modularity of ERP, as well as insight into an offering's technical strengths based on the vendor's history. PeopleSoft was founded as a human-resources management company, and the PeopleSoft Enterprise HCM module continues to be a key asset of this ERP package, offering the broadest set of features found in products in this Buyer's Guide.

For the most part, the HCM module includes tools for human-resources management, performance management, payroll, and time and labor tracking. Some vendors also provide functionality for administering benefits, managing compensation, dealing with salary taxes, recruiting new employees and planning workforce needs. Some also include self-service tools for managers and employees.

Even though HCM is generally considered core ERP functionality, many vendors — including Infor, Lawson Software and Microsoft — offer it as an add-on module. QAD is the one midmarket vendor that doesn't offer an HCM solution.

Manufacturing Operations

The manufacturing module is where much product differentiation happens, including industry-specific functionality. In general, these applications are intended to make manufacturing operations more efficient and simple. Most vendors support different modes of manufacturing, include configurable product capabilities, perform different types of job costing and offer a BOM (bill of materials) tool.

Applications often include PDM (Product Data Management), CRP (Capacity Requirements Planning), MRP (Materials Requirements Planning), forecasting, MPS (Master Production Scheduling), work-order management and shop-floor control.

SCM

Of all the ERP modules, SCM has the greatest variability between vendors: It is vast and varied, yet often adapted to the needs of specific industries. In general, SCM improves the flow of materials through an organization's supply chain by "managing planning, scheduling, procurement, and fulfillment for optimum service levels and maximum profitability," according to Lawson Software. Some vendors segment their SCM into smaller modules. Oracle's JD Edwards, for instance, breaks it down into Supply Chain Planning, Supply Chain Execution (Logistics) and Supply Management (Procurement).

SCM features tend to include also production scheduling, demand management, distribution management, inventory management, warehouse management, procurement, sourcing and order management.

All of these midmarket ERP vendors offer their business-management applications on a modular basis, so they usually can be deployed individually and integrated as more ERP modules are phased in.

Advanced Features

As complex and customizable as even midmarket ERP solutions are, they don't share many advanced features — that's where the industry-specific functionality often comes into play. But three advanced features do set some midmarket ERP solutions above the rest: support for lean manufacturing, SOA capabilities and on-demand delivery.

Lean Manufacturing Support

As the name implies, lean manufacturing is essentially using less of everything. For midsize manufacturers with limited resources, this waste reduction in production and business processes can be an especially critical cost saver. With lean manufacturing, an organization can avoid overproduction, excess inventory, wasted motion, unnecessary processes and idle time. Lean manufacturing can also help an organization deliver products more quickly to customers, be more flexible and, ultimately, succeed in a global marketplace.

A few vendors in this Buyer's Guide support lean manufacturing, including Infor, Oracle-PeopleSoft, and QAD (via an add-on module).

SOA

SOA — also called Web services — has been called the next big thing in enterprise architecture. Infor defines it as "an architectural approach to building and deploying software that is interoperable by design." SOA allows software capabilities to be easily connected and reused, making it quicker and cheaper to assemble, deploy and sustain enterprise-grade technology. With an SOA, organizations can more quickly adapt to changing business processes.

Several midmarket ERP vendors support SOA, including Infor, QAD, Microsoft and SAP. Infor's Open SOA is a "building-block way of tying together a heterogeneous IT architecture." QAD has begun re-architecting its line of business applications to allow it to connect in many different ways under an SOA; it currently uses QAD QXtend to "bridge SOA requirements with [its] traditional software implementation model." Microsoft, of course, leverages .NET to support SOA, and SAP does it with the open technology SAP NetWeaver platform, which supports the use of Java, Microsoft .NET and IBM WebSphere development tools.

On-Demand Delivery

The latest and greatest thing to hit midmarket ERP is on-demand delivery of ERP applications. AMR said, "New pricing and deployment models, such as software as a service (SaaS), are starting to gain acceptance. We expect most of the ERP vendors will begin offering on-demand in addition to on-premises options in the near future." Application hosting and the subscription-based pricing of an SaaS solution will be particularly appealing to midmarket organizations with minimal IT budgets and on-site resources. They can also help organizations react more quickly and with less disruption to structural changes within the company and changes in the market.

Oracle offers hosting services for both its JD Edwards EnterpriseOne and PeopleSoft Enterprise solutions, and QAD also has an on-demand delivery method for its midmarket ERP solution. In early 2008, SAP plans to widely release its new on-demand offering for the midmarket, Business ByDesign

Cost

ERP is expensive, and the cost is highly variable depending on the organization. Company size, number of ERP users, the depth and breadth of purchased functionality, and the business benefits gained from the ERP deployment all contribute to the TCO (total cost of ownership) of an ERP package. So it's no surprise that Aberdeen Group found that the TCO is one of the three main factors when customers make a purchasing decision. According to "The Total Cost of Ownership of ERP in Mid-Size Companies" (July 2007), 52 percent of the 645 midsize survey respondents cited TCO as their top criterion.

Aberdeen Group broke down the average costs — including the average number of ERP users, the price of the software, vendor services and maintenance costs — by midmarket companies' annual revenues:

- For a company that makes $50 million to $100 million, the TCO for 92 users is $1,081,869
- For a company that makes $100 million to $250 million, the TCO for 195 users is $1,719,551
- For company that makes $250 million to $500 million, the TCO for 344 users is $1,987,616
- For a company that makes $500 million to $1 billion, the TCO for 475 users is $3,092,021

In addition, the average software cost for 220 users for all midsize companies surveyed was $695,750. Interestingly, the average service cost was almost as high as that of the software: $560,377. On average, these companies deployed 11 modules from their ERP packages.

Generally, midmarket ERP vendors price their software on a per-module/per-user basis, and any additional modules will also impact the final cost. Although few vendors were willing to disclose actual numbers, Microsoft did reveal its baseline licensing costs. Customers purchase Microsoft's Dynamics products through resellers and choose either the Business Essentials or Advanced Management editions. The Business Essentials edition starts at $2,250 per user, and the Advanced Management edition starts at $3,980 per user.

The à la carte pricing structure isn't the only method for determining cost, however. QAD, for instance, also offers vertical and regional bundles, as well as enterprisewide licenses. QAD says that complete ERP solutions begin at $20,000 and can range into multimillions of dollars for large, multinational manufacturers. Nevertheless, this vendor estimates that an average midmarket ERP investment ranges from $100,000 to $200,000.

When SAP's ByDesign is widely released — it is currently in the early-adopter phase — it promises to bring a low-cost option to the market. SAP is advertising its on-demand offering at a starting price of $149 per user, per month for the software, infrastructure, services and support — as long as the customer licenses 25 users. Group pricing for users that need just limited access to the software will be $54 per month for a set of five users.

Midmarket ERP Solutions Checklist

Key questions to ask before you buy.

Before you commit to any ERP system, you should first answer several questions about what your organization needs and wants to accomplish with its ERP strategy. The answers will help you determine which applications and what kind of functionality your organization requires from its ERP solution, as well as go a long way toward easing the implementation process.

- ❒ **Do your organization's business leaders support the ERP implementation project?** Are they involved in deciding which business processes are included in the ERP package, how to phase in the rollout and how to measure success with the implementation? For ERP to succeed, executives throughout the organization — especially those heading up the various departments that will use the ERP applications — must be a part of the rollout.

- ❒ **Who are the line-of-business professionals that can be responsible for measuring the business benefits relevant to their department's ERP modules?** Employees beyond the IT department need to own the success of the ERP deployment.

- ❒ **Who will be the ERP project manager?** One person — an outside consultant or a current employee — should be in charge of managing the process to choose an ERP solution; coordinating demos and consultations with vendors; leading a team of representative from each area of the company, including finance, sales, human resources and manufacturing; and coordinating meetings between with key users of the new system.

- ❒ **What are the specific business problems you need to solve with ERP?** For instance, do you need to shorten product lead times or improve communications with your suppliers? Are there industry regulations to which your company must adhere?

- ❒ **What are the goals and metrics that you will use to measure the business benefits of your organization's new ERP solution?** A good starting point for these metrics are the KPIs — such as inventory accuracy, cost reductions and month-end closing processes — that your company is already tracking.

- ❒ **What features and functions do you need from a new ERP solution that will help increase users' productivity and provide access to the business data users most need?**

- ❒ **Are there best practices you need to adopt with the ERP implementation?**

- ❒ **If your organization operates around the world, are there foreign currencies and languages that your ERP solution must support?**

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- ❒ **With which modules will you begin rolling out your ERP package?** Midmarket ERP systems are modular enough to allow you to implement them in phases, first rolling out the features that will meet your organization's most dire needs. Taking the implementation in prioritized steps gives IT managers and ERP users a chance to learn new processes.

- ❒ **Is the prospective ERP solution built with SOA capabilities?** Called by many the next big thing in enterprise technology, SOA allows for a more agile and flexible IT environment, connecting systems and automating manual business processes — which is exactly what you want your ERP system to do.

- ❒ **Which users across your organization will need to be trained on the new system?** As with any new system, the success of your ERP implementation will largely depend on end-users' ability — and willingness — to adopt it.

- ❒ **Will the ERP package be able to adapt to changes in your business as your company grows?**

Conclusion

In its “ERP Providers Serving the Midmarket” report, AMR Research found that midsize organizations are using ERP to support a variety of business issues, including globalization, lean manufacturing, conducting e-business, consolidation, shared services, collaborating with suppliers and meeting the requirements of new customers.

To wring the most benefits from an ERP solution, an organization has to use it to its fullest capabilities. Considering the expense of acquiring and deploying an ERP package, it’s surprising how underutilized it often turns out to be. According to Aberdeen’s “2007 ERP in Manufacturing” survey, the average midsize company uses only about 11 out of 24 generic ERP modules, or approximately 72 percent of the available functionality. (Is this math right)

As midmarket companies extend their reach into markets around the world, they require increasingly sophisticated systems to support and run their business. With ERP, they can use enterprise-grade technology as a competitive weapon, managing costs, introducing efficiencies throughout the supply chain and manufacturing processes, and streamlining and automating business processes across the organization. For some companies, ERP can mean the difference between success and failure.

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