

ERP in Manufacturing 2009

Expanding Beyond Traditional Boundaries

June 2009

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Executive Summary

Pressures to reduce costs continue to outweigh all other business drivers impacting Enterprise Resource Planning (ERP) in 2009. ERP has become more than a necessary infrastructure; it is also a strategic weapon in streamlining and accelerating business processes – while providing visibility to those processes throughout the enterprise. This year we look beyond our annual assessment of ERP usage by module and explore the preferences and decisions between point solutions and an end-to-end integrated suite and assess the overall business value ERP brings to manufacturing.

Best-in-Class Performance

Aberdeen used five key performance criteria to distinguish Best-in-Class companies. While the implementation of ERP produced a reduction in costs and improvements in scheduling across all companies, Best-in-Class companies achieved significantly better results:

- 20% reduction in levels of inventory, with 97% inventory accuracy
- 96% manufacturing schedule compliance, and 97% on-time and complete shipments
- An average of 3.7 days to close a month

Competitive Maturity Assessment

Survey results show that the firms enjoying Best-in-Class performance shared several common characteristics:

- Best-in-Class are 163% more likely to continue to measure the return on their ERP investment after it has been achieved
- 88% of Best-in-Class ERP implementations have the continued commitment and attention of senior management throughout selection, implementation, and beyond
- Best-in-Class are 145% more likely to implement extensions as integrated modules of ERP than as separate applications

Required Actions

In addition to the specific recommendations in Chapter Three of this report, to achieve Best-in-Class performance, companies must:

- Continue organizational commitment beyond initial implementation
- Blend ERP extensions with core ERP modules for an integrated end-to-end solution
- Use ROI estimates to cost justify projects; follow up by measuring ROI when projects are complete and continue to measure after goals have been reached

Research Benchmark

Aberdeen's Research Benchmarks provide an in-depth and comprehensive look into process, procedure, methodologies, and technologies with best practice identification and actionable recommendations.

"Companies appreciate functionality that will translate into value for money. The factors influencing the selection [between an integrated suite and a point solution] cannot be analyzed in isolation. An 'either-or' approach doesn't help. An 'and-and' approach will ensure an optimal solution and a more satisfied customers."

~ Kumar Iyer, ERP Consultant
and Project Manager, L&T
Infotech

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Chapter One: Benchmarking the Best-in-Class

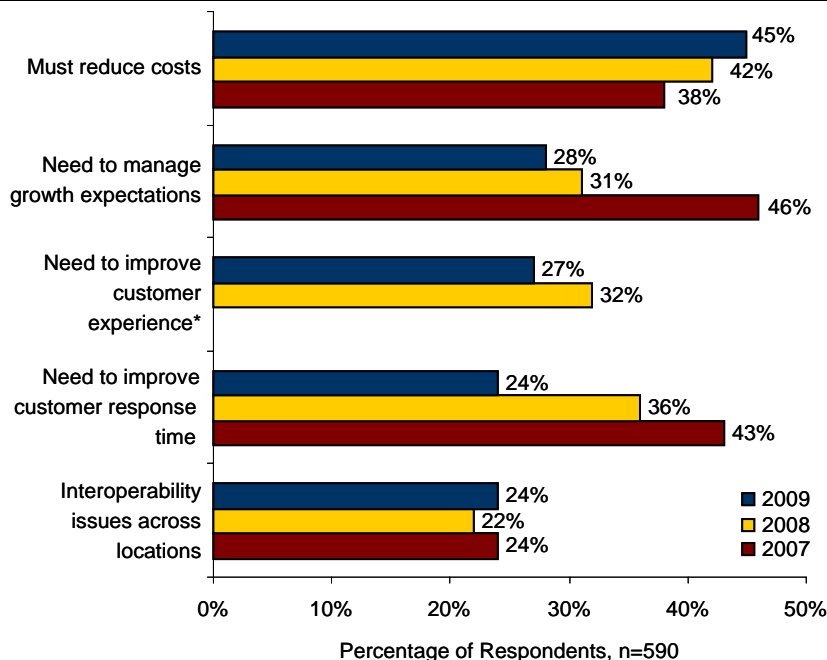
Business Context

The expanding role of enterprise applications over the past two decades has led Enterprise Resource Planning (ERP) vendors to extend solution footprints in order to penetrate more broadly and deeply throughout the enterprise. The 2009 Aberdeen Report found that for 12 out of 18 software extensions the preference was for more integrated suite solutions. The tighter the connection to ERP, the more pronounced the desire for an integrated suite approach. This finding led Aberdeen to delve more deeply, beyond our annual assessment of ERP usage by module. This year we collected data from over 435 manufacturers, providing an annual benchmark of ERP status and usage, as well as the business benefits and Return on Investment (ROI) derived from Best-in-Class implementations. In addition we explore the preferences and decisions between point solutions and an end-to-end integrated suite and its correlation to performance.

Business Drivers Behind ERP Strategies

In this, our fourth annual ERP in Manufacturing benchmark, we continue to follow the trends associated with the business drivers impacting ERP strategies.

Figure 1: Top Two Business Drivers Impacting ERP



* The business drivers "Must improve customer response time" and "Need to be easier to do business with" were combined in the 2007 survey as a single response option.
Source: Aberdeen Group, June 2009

Fast Facts

Best-in-Class ERP implementations slash **93% more** costs (than all others):

- √ **134%** more inventory cost reductions
- √ **59%** more manufacturing operational cost reductions
- √ **87%** more administrative cost reductions

At the same time, they produce 84% better schedule improvements with 23% fewer days' supply of inventory

The 2009 Aberdeen Report

The Aberdeen Report surveyed over 1,400 companies, of all sizes from a variety of industries on a combination of business issues and the use of technology to address those issues. In this survey, participants were asked to select the two technologies which had the most pronounced impact on their organization's success. ERP and Customer Relationship Management (CRM) were the top technologies selected (at 31% and 32% respectively).

In 2006 and 2007, depending on industry and size of company, growth and customer service jockeyed for position as the top pressure, with the need to reduce cost securely in the number three position. We saw a dramatic shift last year as the need to reduce costs emerged as the top pressure regardless of how we sorted and cut the data. This trend continues this year, with the gap widening between this and the second pressure. Since the primary goal of ERP is often to standardize, streamline and accelerate business processes, a logical derivative of this goal is improved efficiency, leading to cost reduction.

Managing to growth expectations rebounded from the third position to contend with three other pressures in a virtual four-way tie for second place in terms of influence over ERP strategies. Indeed, in spite of a deep and continued worldwide recession, 37% of 1,400+ companies participating in the 2009 Aberdeen Report anticipated growth and only 18% predicted a decline in their business. Yet with rising costs of commodities and components, along with volatile markets and fluctuations in oil and energy costs, manufacturers in particular must be ever vigilant in containing or reducing inventory, operating, and administrative costs in order to preserve profit margins since price hikes during a deep recession can often result in lost business.

Putting the customer first is a characteristic of top performing companies. For purposes of this survey, Aberdeen separates issues around customer responsiveness and the overall customer experience. In today's competitive markets, companies that are hard to do business with often find customer loyalty threatened. The visibility ERP provides across the business, providing a single source of data can assist in both responding to customer inquiries, and enabling the kind of flexibility customers demand today.

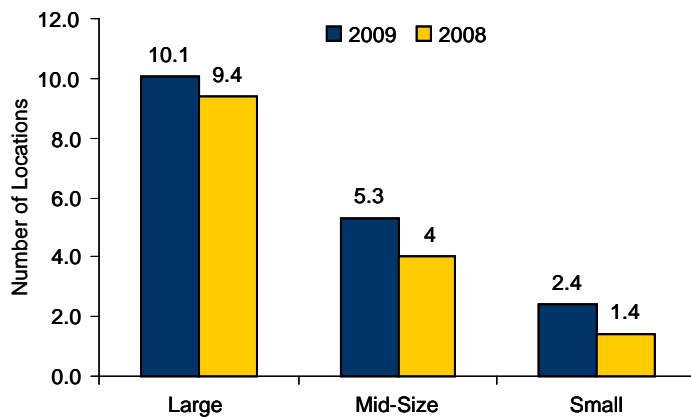
Being easy to do business with is an important business driver, but different from the need to be responsive to the demand for product in the customers' timeframe. As customers strive to reduce their own inventories, the need to respond within shorter lead times grows. Visibility to inventory and production, coupled with the infinite and finite planning and scheduling capabilities that have become standard features in robust ERP solutions today are prerequisites to providing this level of responsiveness.

The pressure associated with interoperability across multiple locations has been a constant over the last three years. Yet companies are operating in increasingly distributed environments, particularly in mid-size companies (Figure 2). The fact that the criticality of this as a business driver has not escalated is a tribute to the ERP solution providers' and the manufacturers' ability to address multiple locations, often across multiple countries, requiring the support of multiple legal entities.

"The single most important benefit we achieved through our ERP implementation was company-wide access to the same information. No single department controls the world!"

~ Information Technology
Manager, distributor of
computer equipment

Figure 2: Number of Manufacturing Locations Supported by ERP



Source: Aberdeen Group, June 2009

Company Size

Aberdeen defines company size by annual revenues:

- ✓ Small companies: Under \$50 million
- ✓ Mid-size companies: Between \$50 million and \$1 billion
- ✓ Large companies: Over \$1 billion

The Maturity Class Framework

Aberdeen used five key performance criteria to distinguish the Best-in-Class from Industry Average and Laggard organizations (Table I). These Key Performance Indicators (KPIs) were chosen not only because every manufacturer should be measuring them, but also because a well executed ERP implementation can have a very significant impact on these metrics.

Table I: Top Performers Earn Best-in-Class Status

Definition of Maturity Class	Mean Class Performance
Best-in-Class: Top 20% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 20% reduction in inventory levels ▪ 97% inventory accuracy ▪ 3.7 days to close a month ▪ 96% manufacturing schedule compliance ▪ 97% complete and on-time shipments
Industry Average: Middle 50% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 9% reduction in inventory levels ▪ 93% inventory accuracy ▪ 5.6 days to close a month ▪ 89% manufacturing schedule compliance ▪ 93% complete and on-time shipments
Laggard: Bottom 30% of aggregate performance scorers	<ul style="list-style-type: none"> ▪ 6% reduction in inventory levels ▪ 86% inventory accuracy ▪ 7.6 days to close a month ▪ 76% manufacturing schedule compliance ▪ 82% complete and on-time shipments

Source: Aberdeen Group, June 2009

Between 2007 and 2008 we saw a slight dip in performance in terms of overall cost reductions, not only in inventory, but also in operating and

administrative costs. This year we saw these same metrics hold steady, with less than one percentage point spread between 2008 and 2009 Best-in-Class metrics. Indeed, these metrics also held steady in the Industry Average and Laggard categories, with the exception of the ability to shrink inventory, which dipped by 25% in Industry Average companies. This is an indication of the stronger getting stronger at the expense of the weaker. As top performing companies continue to lean out inventories and yet demand faster response time from their suppliers, where does this "leaned out" inventory wind up? It ends up in the warehouses of the less competitive companies.

The Best-in-Class PACE Model

To achieve the type of benefits displayed in Table 1 from an ERP solution, a combination of strategic actions, organizational capabilities, and enabling technologies are required. These can be summarized as shown in Table 2.

Table 2: The Best-in-Class PACE Framework

Pressures	Actions	Capabilities	Enablers
<ul style="list-style-type: none"> ▪ Must reduce costs 	<ul style="list-style-type: none"> ▪ Streamline and accelerate business processes ▪ Standardize business processes ▪ 	<ul style="list-style-type: none"> ▪ Standardized enterprise-wide procedures for order management, procurement, production planning and execution, cash collection, and financial reconciliation ▪ Real-time visibility of all processes from quote to cash ▪ ERP implementation has the continued commitment and attention of senior management throughout selection, implementation, and beyond ▪ ROI estimates are used to justify ERP projects and measured to validate business value 	<ul style="list-style-type: none"> ▪ Integrated ERP modules: General Ledger, Accounts Payable, Accounts Receivable, Fixed Asset Management, MRP, Shop Floor Control, Purchasing, Inventory Control, After Market Service, ECM, CRP, DRP, MPS, Forecasting / Demand Planning, Human Resources, Order Management, Project Management, EAM, Supplier collaboration / scheduling, Sales and marketing, product configurator, Payroll ▪ Workflow automation / Business Process Management ▪ Event Management (triggers and alerts) ▪ Extensions to ERP including CRM, SRM, SCP, WMS, TMS, Project / Portfolio Management, BI and others

Source: Aberdeen Group, June 2009

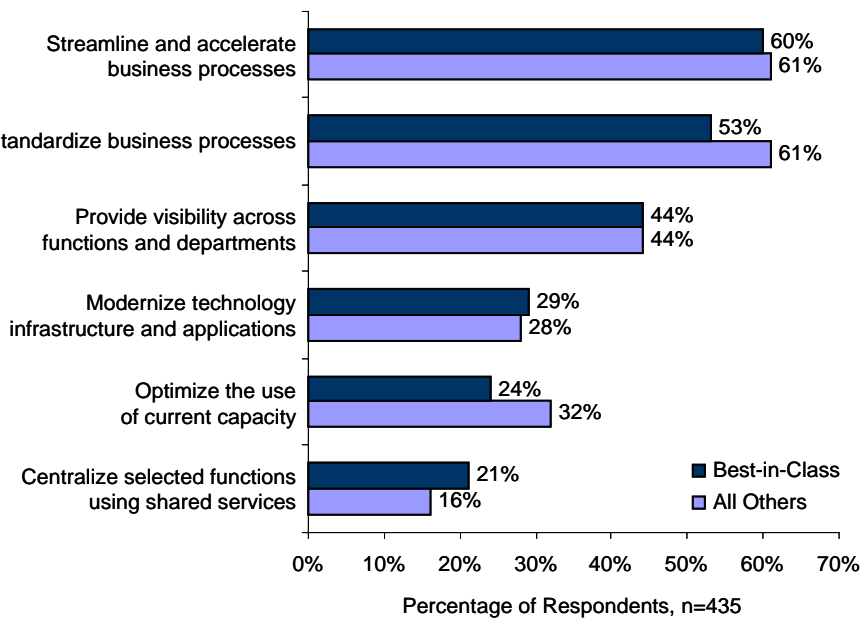
Best-in-Class Strategies

We see remarkably little difference across the maturity classes in terms of strategic actions in response to these pressures (Figure 3). This is a phenomenon that has been consistent over the years, indicating a sound strategy is not sufficient to guarantee success. Execution of that strategy is a far more differentiating factor, as we will see in Chapter Two in analyzing the business capabilities actually achieved.

All companies appear to recognize the key role ERP can play in streamlining and accelerating business processes and indeed many now look to their ERP solution to provide a vehicle to standardize business processes around well-

defined best practices. More and more ERP solution providers now ship work flows and best practices as implementation templates, accelerating implementation and providing a framework for defining and tailoring business processes.

Figure 3: Top Two Strategic Actions in Response to Pressures



Source: Aberdeen Group, June 2009

These efficiencies lead to improvements in both costs and schedule performance. Not only were companies in our Best-in-Class category able to reduce inventory by 20%, but they also slashed both operating and administrative costs by 14% while also improving the percentage of orders shipped complete and on time by 21%. This and a 20% rise in schedule compliance can be directly linked to visibility and communication. They achieved these levels of performance with 23% fewer days' supply of inventory.

Providing visibility across functions and departments remains in the top three strategic actions. However, even though this has been a priority for the past three years, we find those that deliver against this strategy are in the minority. We observe only 31% of all survey participants today have full visibility to all business processes from quote to cash. Best-in-Class outperform all others by 40%, but still only 41% can claim this achievement. This indicates a failure across all maturity classes to take full advantage of their integrated solutions and / or the failure to put access to this information directly in the hands of decision-makers.

This level of visibility is often hampered by legacy applications. While ERP solution providers have added configurability and "ease of use" features into their products, companies stuck on old releases based on outdated technologies will find their ability to execute against these strategies

"Prior to implementing [a new ERP based on latest technology], we were running two different CRM systems and ERP and yet we were still managing inventory with spreadsheets. For over 30 years, BendPak built a reputation for same day delivery. Over time, many duplicate items were created in the system by our sales departments in order to process sales quickly, resulting in our logistics folks working from descriptions to deliver the correct items from inventory, and we held large inventories to be sure that we could fulfill all orders. We did not have the necessary system controls and best practices in place, however we did meet our commitments, but this came at a cost for us.

"Now we now have the necessary controls in place. Today, we cannot sell a product without associated inventory, so duplicates have been phased out. This initiated a huge maturation of the company and brought discipline to our sales and logistics operations. While it was a culture shock, we were able to reduce inventory between January [2009] and now by over 30%. Now our challenge is to maintain the discipline and maintain lean inventory levels. In this market liquidity is king and that was a major driver for the implementation."

~ Sina Moatamed, CTO,
BendPak, Inc.

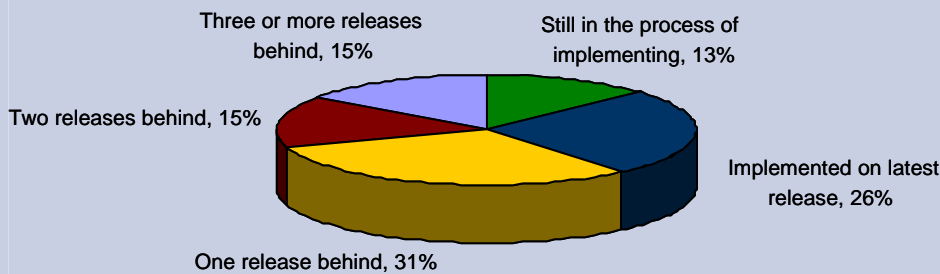
severely limited. While not in the top three, Aberdeen finds it encouraging that 28% of our survey participants this year have added modernization of technology infrastructure and applications as a top-two strategic action.

Aberdeen Insights — Strategy

Over the course of the last three years, Aberdeen has collected data on the top ERP selection criteria. Not surprisingly, functionality, Total Cost of Ownership (TCO), and ease of use have been the top three selection criteria. This year is no exception with functionality topping the list, rated 4.8 on a scale of 1 to 5 (where 5 is the highest priority), making fit and function the single most important criteria.

Yet no ERP solution is ever a perfect fit and no ERP implementation is ever "complete." Businesses evolve and technology evolves and if one does not keep up with the other, manufacturers can potentially lose their competitive edge. Companies that are able to take full advantage of their current stack of technology and applications, including innovations delivered by ERP solution providers, are better positioned to compete. It is not surprising therefore to find 62% of Best-in-Class operating either on the latest release available from their solution providers, or one release back, and indeed our top performers are 42% more likely to be on the latest release than a combination of Industry Average and Laggards. Yet overall only 26% of all respondents are operating on the most up-to-date versions available.

Figure 4: Current Status of ERP Implementations



Source: Aberdeen Group, June 2009

The pursuit of the perfect fit, drives many companies to customize ERP. The decision to customize or adapt business practices to align with "plain vanilla" software has always been an influential factor in any company's ability to stay current with new releases. The more tailoring of the business logic, reporting and user interface that can be done without touching the underlying code, the easier it is to do just that.

continued

Aberdeen Insights — Strategy

Fortunately the options to tailor and configure, rather than customize, have increased dramatically over the past several years. Thirty six percent (36%) of all respondents indicate customizations are a key deterrent in preventing them from upgrading, thereby creating an obstacle to taking advantage of new features and functions. Yet Best-in-Class are 32% less likely to face this obstacle than Laggards. This does not preclude them from customizing, but indicates they are less likely to customize in such a way as to create obstacles on the path forward.

In the next chapter, we will see what the top performers are doing to achieve these gains.

Chapter Two: Benchmarking Requirements for Success

The selection and implementation of ERP is a major undertaking for any company. Using ERP as a template for standardization of business processes, as well as the integration and coordination of people, processes, and technology can have a significant impact on the benefits achieved.

Case Study — Valero Engineering Corporation

Valero Energy Corporation is a Fortune 500 company based in San Antonio, Texas. Valero has an extensive refining system with a throughput capacity of approximately three million barrels per day. The company's geographically diverse refining network stretches from Canada to the US Gulf Coast and West Coast to the Caribbean and also has a mid-stream logistics system that supports Valero's refining and marketing operations. Valero also has a network of about 5,800 retail and wholesale branded outlets. Valero has approximately 22,000 employees and total assets of \$34 billion. The largest refiner in North America, Valero's current annual revenues of over \$110 billion have grown through acquisitions from approximately \$5 billion in 1997. While many other companies are working on multi-year plans to reduce their number of ERP systems ("instances"), Valero already runs its entire enterprise-wide operation from a single instance of ERP. "Our strategy from day one was to fully integrate each acquisition, and that included applications and supporting infrastructure," said Nayaki Nayyar, Vice President of Enterprise Architecture and Technical Development. "Once an acquisition is announced, the acquisition team is on site and working to integrate the new company into the single instance. All key processes are consolidated and standardized."

This philosophy also carried over to decisions between an integrated suite of products versus point solutions. "Point-to-point solutions were discouraged from the beginning because of their higher long-term cost. They were allowed only when there were requirements that were very specific to a refinery. The efficiency of integration was the key. Integrated solutions mean faster integration of the business, optimized business processes, higher profit margins, and better visibility to performance."

This philosophy, along with much due diligence, led Valero to implement a fully integrated business suite, including ERP with complementary functionality. Every interface is estimated to cost \$50,000 to \$100,000, including the initial development and maintenance over a five- to 10-year period. Each point solution would add multiple interfaces. Ms. Nayyar indicates, "We look at the whole picture. We want new functionality, but we also weigh the costs. Even if the point solution is initially fairly cheap, we determine what it would cost to integrate across the enterprise."

continued

Fast Facts

- √ 88% of Best-in-Class ERP implementations have continued senior management commitment and attention throughout selection, implementation and beyond
- √ Best-in-Class are 163% more likely than all others to continue to measure ROI of ERP after it has been achieved
- √ Weighted average use of ERP modules dropped 8% year over year while average growth in adoption of ERP extensions grew by 29%

Case Study — Valero Engineering Corporation

"We count how many interfaces are required for any point solution and investigate how many interfaces are reusable. We also prefer if integration is built into the product. If we cannot reuse interfaces, the cost may not be justified."

Competitive Assessment

Aberdeen Group analyzed the aggregated metrics of surveyed companies to determine whether their performance ranked as Best-in-Class, Industry Average, or Laggard. In addition to having common performance levels, each class also shared characteristics in five key categories: (1) **process** (demonstrated ability to standardize processes and ERP implementation); (2) **organization** (executive commitment and assigned ownership of ERP implementation); (3) **knowledge management** (providing visibility in order to drive decision-making); (4) **technology** (effective use of modules of and extensions to ERP); and (5) **performance management** (the ability of the organization to measure its results to improve its business).

Table 3: The Competitive Framework

	Best-in-Class	Average	Laggards
Process	Standardized implementation of ERP across a potentially distributed enterprise		
	69%	55%	47%
Organization	ERP implementation has the continued commitment and attention of senior management throughout selection, implementation and beyond (in support of upgrades and extension)		
	88%	70%	56%
	Line of business ultimately owns the success of the implementation		
	71%	53%	48%
Knowledge	Real-time visibility in all process from quote to cash		
	41%	32%	24%
Technology	ERP usage:		
	<ul style="list-style-type: none"> ▪ average of 11.4 modules implemented¹ ▪ 74% of functionality available deployed ▪ 35.0% weighted average of ERP usage² 	<ul style="list-style-type: none"> ▪ average of 9.9 modules implemented¹ ▪ 73% of functionality available deployed ▪ 29.8% weighted average of ERP usage² 	<ul style="list-style-type: none"> ▪ average of 9.6 modules implemented¹ ▪ 69% of functionality available deployed ▪ 27.6% weighted average of ERP usage²

Modules Included in ERP Usage:

- √ General Ledger
- √ Accounts Payable
- √ Accounts Receivable
- √ Fixed Asset Management
- √ Material Requirement Planning (MRP)
- √ Capacity Requirements Planning (CRP)
- √ Distribution Requirements Planning (DRP)
- √ Master Production Schedule (MPS)
- √ Forecasting / Demand Planning
- √ Human Capital Management
- √ Order Management
- √ Project Management
- √ Shop Floor Control
- √ Purchasing
- √ Inventory Control
- √ After Market Service
- √ Engineering Change Management
- √ Enterprise Asset Management
- √ Supplier Collaboration / Scheduling
- √ Event Management
- √ Workflow Technologies
- √ Sales and Marketing
- √ Product Configurator
- √ Payroll

	Best-in-Class	Average	Laggards
	Likelihood to implement extensions as integrated modules of ERP rather than as separate applications		
	145% more likely	20% less likely	23% less likely
Performance	ROI estimates are used to cost justify ERP projects		
	66%	48%	31%
	ROI is measured at the completion of ERP Projects		
	46%	27%	16%
	ROI continues to be measured after it has been achieved		
	42%	18%	12%

1. The number of modules is based on a set of 24 generic modules (see sidebar)
 2. Calculated as: average number of modules / 24 X percent of functionality used
- Source: Aberdeen Group, June 2009

These characteristics (identified in Table 3) serve as a guideline for best practices, and correlate directly with Best-in-Class performance across the key metrics.

Capabilities and Enablers

Based on the findings of the Competitive Framework and interviews with end-users, Aberdeen’s analysis of the Best-in-Class demonstrates that:

- a standardized approach to ERP implementation
- with appropriate executive oversight
- coupled with comprehensive use of features and functions and vigilant attention to the ongoing pursuit of return on ERP investments

...can lead to significant cost reductions and improvements in schedule performance, resulting in enhanced overall business performance.

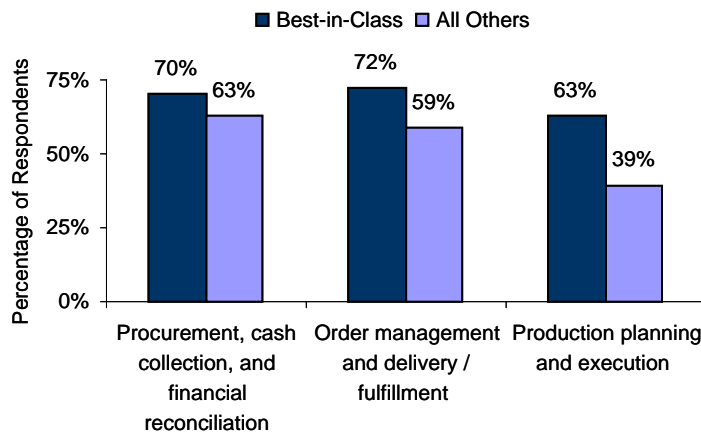
Process

Our top two strategic actions, standardizing as well as streamlining and accelerating business processes, go hand-in-hand. The more standard the process, the more easily it is automated, adding speed and efficiency. While a strategic action of all respondents, Best-in-Class ERP implementations are more successful in defining and executing against defined standards than the remaining 80% of companies surveyed (Figure 5).

"Before the corporation decided to develop a centralized IT function, and to settle on one global ERP / data warehouse system, one of our business families, had already implemented an ERP system to manage their operations at five factories and 15 service centers in three countries. This project turned out to be extremely effective in delivering business value as well as providing a timely and under-budget implementation. As a result, when corporate decided to take ownership of IT and to spread the system to all of their operations (potentially 26 factories in 13 countries), they decided to follow the same model."

~ Jim Moore, Global ERP
Manager Project Manager,
Robbins & Myers

Figure 5: Standardized Procedures across Similar Businesses



Source: Aberdeen Group, June 2009

We don't see a huge gap in this capability across the more easily standardized back office and front office processes. We find similar results in comparing the average manufacturer's ability to standardize ERP implementation to top performers. Sixty-nine percent (69%) of Best-in-Class have standardized implementations, compared to 52% of all others.

Where we do see a much larger distinction is in standardizing production planning and execution. We could easily explain the lack of standards in very diverse environments, but we couched the question in very specific terms of "similar businesses," and a multitude of diverse practices cannot all be best. Simply standardizing does not of course insure that the standard is best practice, but having diverse, non-standardized processes does insure that at least some are not "best." Of course capital intensive operations may be limited by existing facilities and equipment, but where it is possible to standardize, significant efficiencies, and perhaps even scale, can be realized.

Often the lack of standardization can be blamed on growth through acquisition, where not only business processes but also ERP implementations have been inherited. Back office processes that are not immediately visible to the customer are often the first and most easily consolidated, often in the initial push to reduce redundancies within the enterprise. Consolidation then spawns standardization, usually forcing the acquired departments and functions to conform to existing standards. Manufacturers must be more cautious in implementing these types of changes in customer-facing functions, for fear of business disruption. These standardizations come at a slower pace, but if implemented well, can also produce significant savings.

This becomes even more important as the footprint of ERP expands beyond its traditional boundaries. As additional investments are made in advanced modules of ERP, a worldwide roll-out of these capabilities is best facilitated by standard implementations. This is of course only possible where there is a single ERP solution in place. We find the average number of different ERP

"We have what we call key pillars of production that manufacture products consumed in other [of our own] products. We have a single global instance of ERP and a center of excellence for business process definition. By taking this approach we turn these pillars into a cornerstone for all production and more easily feed other plants."

~ Anna Reuhl, Global Business Process Manager, Dow Corning Corporation

"What prompted the upgrade from a legacy version of our ERP solution to a more modern architecture was the strategic direction of the company to be more process-driven. We couldn't keep up with our functional needs on the older version and back in the late '90's we were not globally compliant with Y2K requirements. But this major project was not IT driven. My role is to provide business solutions and services. My team consists of business process experts as well as application developers."

~ Global Business Process Manager, global leader in silicone manufacturing

packages implemented ranges from 1.4 in small companies to 2.3 in mid-size and 3.5 in large manufacturers. Yet many elements of an ERP implementation, such as normalized master data and procedural definitions, can be standardized even across diverse ERP applications.

Where these added investments are separate applications, standardization becomes even more important. With common processes and data definitions, a single application can be used as a standard, interfaced to, or integrated with multiple ERPs.

Organization

While features and functions and the underlying technology infrastructure are critical to the success of an ERP implementation, several organizational capabilities are equally important. Management commitment is a well-recognized requirement for a successful ERP. Yet executive support is more likely to be in evidence in the early stages of initial implementation. That sustained commitment through selection, implementation, and beyond (including upgrades, extension, and continued investment) is just as critical. The vast majority of Best-in-Class (88%) distinguish themselves with this sustained support. They are also 58% more likely than Laggards to continue to train new employees in the use of ERP after the initial implementation.

Best-in-Class ERP implementations exhibit several other organizational capabilities. When ERP is "owned" by the Information Technology (IT) department the true Return on Investment (ROI), measured in cost reductions and performance improvements is often overlooked. Over the past three years we've seen a trend toward more implementations owned by line of business executives that are indeed measured on metrics such as those Aberdeen uses in our Best-in-Class criteria. Yet we still see this as a point of differentiation for our Best-in-Class, with little difference between Average and Laggards, but top performers almost half as likely to assign ownership outside the IT department. Correlate this with an average of 93% more reductions in cost and 87% more schedule improvements with 23% fewer days of inventory (between Best-in-Class and all others). By placing ownership with the executives who stand to gain the most from the implementation, the focus shifts to performance improvement, placing significantly more emphasis on ROI.

Forming cross functional teams for selection and implementation and dedicating the resources necessary to effectively complete projects on time and within budget are other important factors.

Knowledge Management

In light of the financial crisis that has been upon us since September 2008, transparency internally across organizations and in communicating with trading partners, investors, and other stakeholders has never been more critical. Complete visibility is a prerequisite to such transparency and communication. Yet, in spite of the fact that 44% of all survey respondents selected *providing visibility across functions and departments* as a "top-two"

"ERP is a long term commitment. It is not something you can casually move in and out of a company. We needed to make sure the solution had a solid roadmap that would meet our long term goals."

~ Sina Moatamed, CTO,
BendPak, Inc.

"We knew how much revenue we had, but we had little or no visibility as to where our profit was coming from. If for example we wanted to know how much business we had done in healthcare in the Northeast region, we had no single source of data to turn to. We had many different offline spreadsheets. We had manual processes and hard copy files. In processing orders and servicing customers, these hard copy files could transfer from desk to desk up to eight times.

"We needed to be able to add new geographic regions, attack new market segments and change our corporate structure as needed. We needed to look at gross profit from many different angles. We wanted to eliminate the need for offline spreadsheets. We still have some, more as backup, but we are continuing to move away from them. We have eliminated manual processes and those hard copy file swaps. We are still bringing sales onto the system, but now we have a 360-degree view of our company."

~ Brent Walters, CFO,
OneVision Solutions

strategic action, only 31% have achieved real-time visibility to all business processes from quote to cash. Even Best-in-Class are lagging in this capacity, with more than half (59%) still lacking it.

The value proposition for investing in ERP has traditionally been tied to the standardization of business processes and centralization of information that makes it easier and faster to collect and manage data across many areas of the business. Increasingly, companies using ERP have come to realize that the value from these investments can be increased dramatically through analysis of the consolidated data captured within the system. The fact that so few are able to achieve this visibility tells us they need to expand beyond the traditional scope of ERP to also include some level of business intelligence, whether that is provided as a core capability or an extension to ERP...which brings us back to our original premise and the role of the integrated suite of functionality.

Technology

Since 2006, Aberdeen has been measuring ERP usage based on the number of modules implemented in combination with the percentage of functionality available (from those modules) that is actually used. The number of modules implemented in 2006 and 2007 were identical and finally inched up slightly in 2008, only to drop in 2009. The percentage of available functionality deployed rose steadily from 2006 to 2008, but then dipped slightly this year, to the extent that the weighted average has also declined.

Table 4: ERP Usage Trends

Average Aggregated ERP Usage			
2006	2007	2008	2009
<ul style="list-style-type: none"> ▪ 10.5 modules implemented¹ ▪ 63% of functionality available deployed ▪ 27.6% weighted average of ERP usage² 	<ul style="list-style-type: none"> ▪ 10.5 modules implemented¹ ▪ 71% of functionality available deployed ▪ 31.2% weighted average of ERP usage² 	<ul style="list-style-type: none"> ▪ 10.7 modules implemented¹ ▪ 74% of functionality available deployed ▪ 32.6% weighted average of ERP usage² 	<ul style="list-style-type: none"> ▪ 10.1 modules implemented¹ ▪ 72% of functionality available deployed ▪ 30.1% weighted average of ERP usage²

1. The number of modules is based on a set of 24 generic modules (see previous sidebar)

2. Calculated as: average number of modules / 24 X percent of functionality used

Source: Aberdeen Group, June 2009

In looking only at these statistics, this appears to be a precipitous drop in usage. However, when we look at it in conjunction with the adoption rates of ERP extensions, we see that implementation of functionality has expanded, not contracted.

Aberdeen is careful to distinguish between a “module” of ERP and an “extension.” All the modules of ERP use a single data base model.

Integration is built in and there is little or no redundancy of data elements, except where there is a specific need. A module is built with the same development tools on the same architecture as core ERP. While a module can be implemented incrementally, its release cycle is in lock step with the remainder of the core ERP modules.

The simplest definition of an extension to ERP is an enterprise application that extends the functionality, but is separate. If provided by the ERP vendor, its release cycle may or may not be synchronized with core ERP. Many of these functional areas could indeed be addressed by either. We have chosen to keep our list of standard ERP modules constant since 2006 to preserve year-over-year comparisons. However, this year we also redundantly added some of the modules as extensions, cautioning survey respondents not to select a module if it had been purchased as a separate application and we expanded the list. As a result the list of extensions for which we captured data grew from 10 in 2008 to 17 in 2009.

The adoption rate for each of the 10 extensions that appeared in both the 2008 and 2009 surveys grew. We observed an average growth in adoption of 29%, ranging from 5% to 58% (see sidebar). In addition, we observed higher adoption rates in our top performers (Table 5).

Table 5: Adoption Rates of ERP Extensions

Extension	Best-in-Class	All Others
Business Intelligence (BI)	46%	30%
Contact Center Management	25%	11%
Customer Relationship Management (CRM)	43%	31%
Document Management	35%	22%
Enterprise Asset Management (EAM)	25%	11%
Enterprise Manufacturing Intelligence (EMI)	19%	6%
Field Service Management	17%	8%
Financial Planning & Budgeting	35%	20%
Human Capital Management (HCM)	19%	13%
Manufacturing Execution System (MES)	26%	23%
Product Lifecycle/Data Management (PLM / PDM)	25%	20%
Project/Portfolio Management (PPM)	13%	12%
Quality Management System (QMS)	38%	27%
Supply Chain Planning (SCP)	28%	18%
Supplier Relationship Management (SRM)	30%	12%
Transportation Management System (TMS)	20%	12%
Warehouse Management System (WMS)	39%	19%

Source: Aberdeen Group, June 2009

Growth in Adoption Rates of ERP Extensions:

- √ 20% Customer Relationship Management (CRM)
 - √ 29% Product Life Cycle / Data Management (PLM / PDM)
 - √ 29% *Supplier Relationship Management (SRM)*
 - √ 44% Supply Chain Planning (SCP)
 - √ 5% Warehouse Management Systems (WMS)
 - √ 58% Transportation Management Systems (TMS)
 - √ 12% Business Intelligence (BI)
 - √ 21% Quality Management Systems (QMS)
 - √ 15% Manufacturing Execution Systems (MES)
 - √ 30% *Enterprise Asset Management (EAM)*
 - √ 29% *Human Capital Management (HCM)*
- Those that appear italicized were also listed similarly or identically as ERP modules
- The extensions added in 2009 were:
- √ Contact Center Management
 - √ Financial Planning & Budgeting
 - √ Human Capital Management
 - √ Document Management
 - √ Field Service (beyond ERP)
 - √ Enterprise Manufacturing Intelligence (EMI)
 - √ Project / Portfolio Management (PPM)

For those extensions implemented, we delved deeper into how and from whom those solutions had been purchased – either as a module or an extension. Table 6 (which combines both types of purchases) indicates Best-in-Class in particular have a strong preference for purchasing these solutions from their ERP solution provider. All technology solution providers and the ERP user community are not as careful to distinguish between the modules and separate applications purchased from the same vendor, as evidenced by users of certain ERP solutions claiming to run a "module" which does not in fact exist. However, if the integration between ERP and a separate application is transparent enough to make the application appear as an ERP module, both the solution provider and the end-user will have met their goals of seamless integration. However, there still may be an added cost of maintaining that integration through upgrade cycles and adoption of new features, functions, and modules.

"It amazes me how often we select a system because of the breadth of functionality, and then fail to take advantage of it."

~ ERP Project Manager, Multi-national, industrial equipment manufacturer

Table 6: Percent of Extensions Purchased from their ERP Vendor

Extension	Best-in-Class	All Others
Business Intelligence (BI)	66%	42%
Contact Center Management	76%	35%
Customer Relationship Management (CRM)	77%	42%
Document Management	47%	31%
Enterprise Asset Management (EAM)	73%	67%
Enterprise Manufacturing Intelligence (EMI)	92%	64%
Field Service Management	82%	43%
Financial Planning & Budgeting	68%	39%
Human Capital Management (HCM)	61%	54%
Manufacturing Execution System (MES)	83%	51%
Product Lifecycle/Data Management (PLM / PDM)	53%	36%
Project/Portfolio Management (PPM)	88%	36%
Quality Management System (QMS)	70%	50%
Supply Chain Planning (SCP)	94%	58%
Supplier Relationship Management (SRM)	83%	59%
Transportation Management System (TMS)	63%	42%
Warehouse Management System (WMS)	95%	59%

Source: Aberdeen Group, June 2009

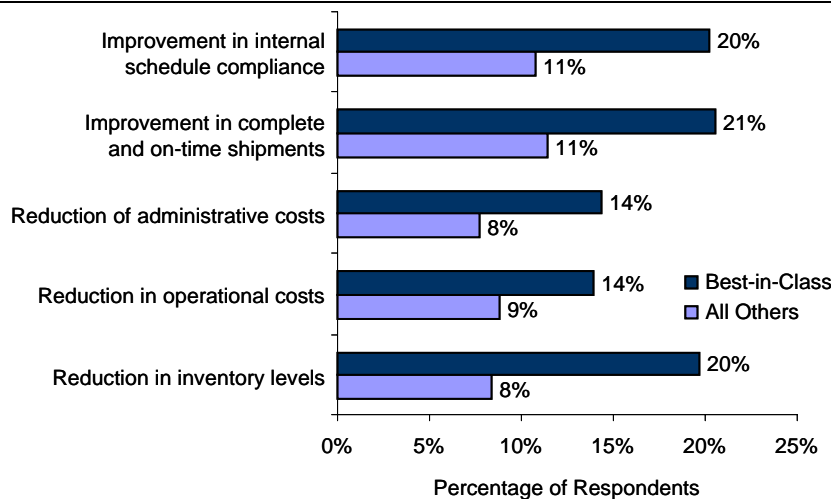
Performance Management

Best-in-Class companies are 57% more likely (than all others) to utilize Return on Investment (ROI) estimates to cost justify ERP projects, and 100% more likely to measure the results when the projects are completed. More dramatically, Best-in-Class are 163% more likely to continue measuring ROI even after it has been achieved. While low Total Cost of Ownership (TCO) has been a dominant and visible value proposition

claimed by many ERP solution providers over the past decade, recently we have seen a resurgence of customer (and prospect) demand for not only lower TCO but also ROI as measured by quantifiable business benefits. As technology and operating budgets alike get squeezed, it becomes more and more important to prove a return on any investment and ERP and other enterprise application budgets are no exception.

Initial return on any technology investment is typically measured in the timeframe required to recoup the initial outlay of cash for hardware, software, and services. The specific source of ROI will vary from company to company, depending on the specific goals and objectives of the purchase. Aberdeen collected five specific "improvement" metrics that could easily be the source of the total or partial ROI of ERP.

Figure 6: Potential Sources of ROI



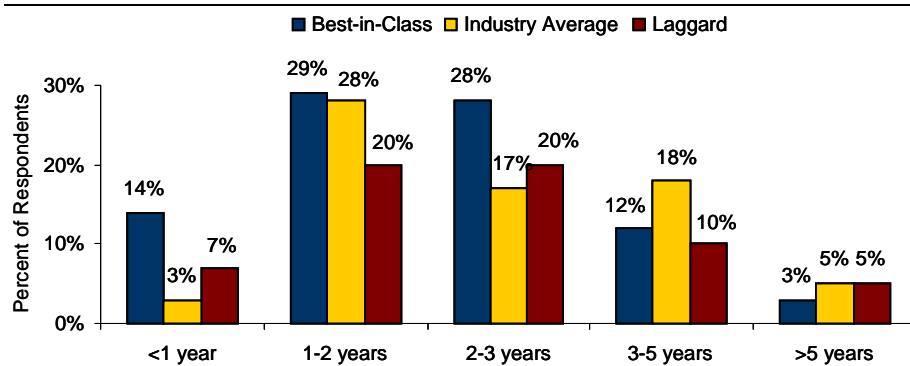
Source: Aberdeen Group, June 2009

Improvements in internal schedule compliance and customer-facing performance in the percentage of orders shipped complete and on time are one step removed from the direct benefit of fostering increased revenue and profit margins, but quantifiable benefits just the same. Many companies, particularly those manufacturers that are Best-in-Class, are able to recoup technology investments just from inventory reductions alone, not to mention other operational and administrative cost reductions. While Best-in-Class average almost twice the cost savings of all others, even Laggard ERP implementation produce measurable cost savings. They simply take longer to produce 100% return.

We find Best-in-Class manufacturers with more aggressive expectations on ROI (Figure 7) with 43% of Best-in-Class expecting an ROI from ERP within a two-year timeframe, and 14% being very aggressive and expecting to recoup costs within a year. Compare these expectations to Industry Average, with only 31% expecting results within two years, and only 27% of Laggards. These more aggressive plans seem to pay dividends, as 76% of Best-in-Class are actually able to realize ROI within the expected timeframe,

and are 52% more likely to do so than poorer performers who allow longer timeframes.

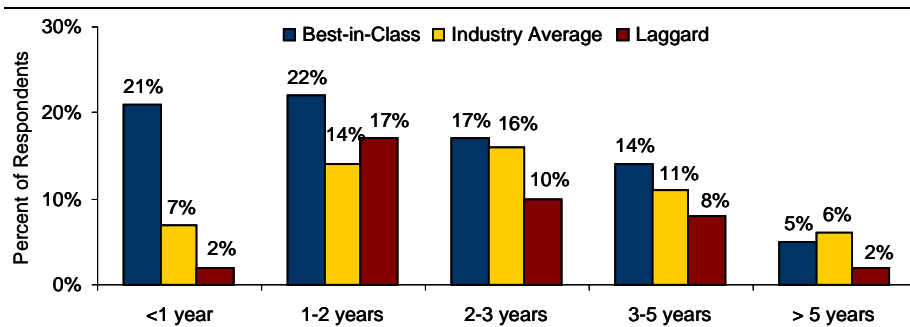
Figure 7: Expected Timeline of ROI



Source: Aberdeen Group, June 2009

Figure 10 completes the picture with actual timelines for ROI. Notice that only 30% of Laggards and 40% of Industry Average are accounted for in Figure 10. The remainder has either not yet achieved ROI or don't know, a further indication of poor visibility.

Figure 8: Actual Timeline of ROI



Source: Aberdeen Group, June 2009

Aberdeen Insights — Technology

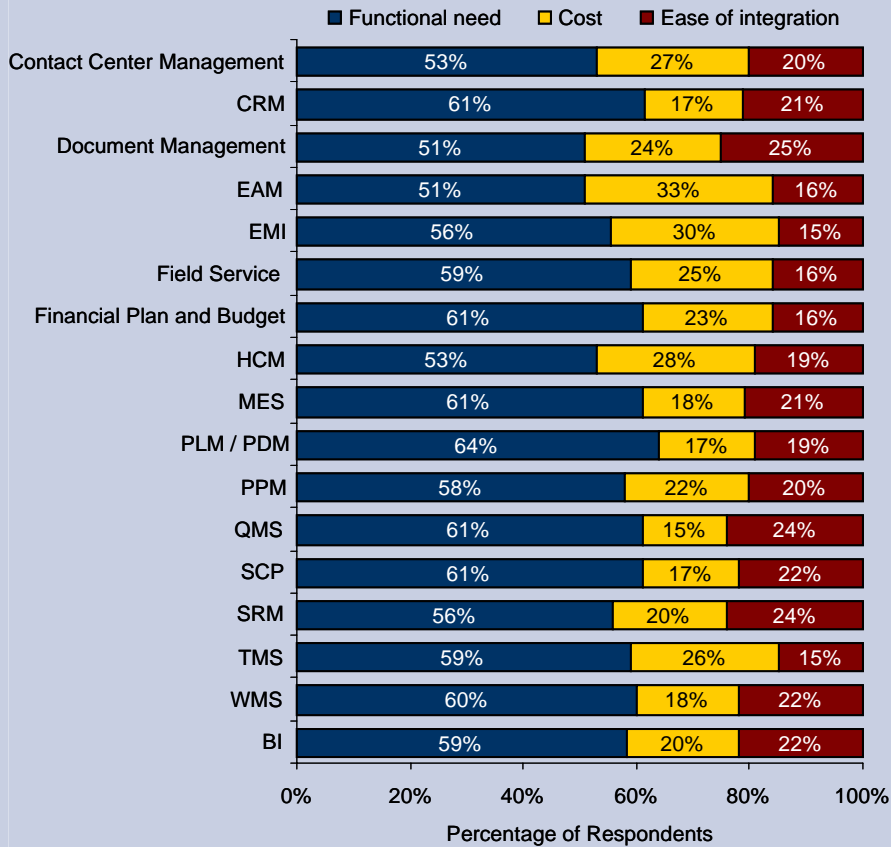
In observing the significant inclination companies seem to have in purchasing extensions from their ERP solution providers, one might assume that cost and ease of integration are behind this preference. While these considerations do play a role, manufacturers are unwilling to sacrifice functionality for either of these factors (Figure 9). In every one of the 17 extensions listed, functionality outweighs cost and ease of integrations combined. This puts added pressures on ERP solution providers.

It is no longer sufficient for them to provide lighter weight modules in the interest of lower cost and no requirement for integration.

continued

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Figure 9: Most Important in Choosing Extensions to ERP



Source: Aberdeen Group, June 2009

Chapter Three: Required Actions

Since 2006, Aberdeen has repeated many of its recommendations for improving ERP implementations. Some are well-known prerequisites to successful implementation. Yet evidence that they are not universally put into practice indicates that they bear repeating, even as nothing more than a reminder of what anyone who has ever been involved in such an implementation knows to be generally accepted best practices.

Laggard Steps to Success

- **Standardize production and planning processes across similar businesses.** Laggards are 40% less likely to have standardized these manufacturing-specific processes than they are to have standardized back office processes such as procurement, cash collection, and financial reconciliation. Through standardization, interoperability across multiple manufacturing locations is optimized. All locations involved in production planning and execution use the same language and the same metrics, facilitating better communication and cooperation. The opportunity for production in one facility to have a negative impact on another is minimized.
- **Make training a priority in on-boarding new employees that will use ERP.** Best-in-Class are 58% more likely than Laggards to continue to train new employees in the use of ERP after the initial implementation. Without this level of continued focus, ERP usage and the resulting benefits will decline as the implementation matures.
- **Estimate ROI to justify ERP projects.** Less than a third (31%) of Laggards has incorporated this as a standard procedure. In estimating how and when the cost of initial implementation or even major upgrades or extensions to ERP will be achieved, organizations can effectively set goals and the higher the goal, the more business value derived. Best-in-Class are more than three-times as likely to use ROI to cost justify projects. This correlates to 136% more cost reductions and 268% more schedule improvements.

Industry Average Steps to Success

- **Continue to make an organizational commitment to ERP beyond initial implementation.** Senior management commitment is necessary for any ERP implementation to be successful. We observed little difference between Industry Average and Laggard continued commitment of executive levels to ERP through selection, implementation and beyond. Aberdeen is of the firm belief that an ERP implementation is never "done." Businesses continue to evolve and therefore the requirements evolve as well.

Fast Facts

- √ Best-in-Class are more than three-times as likely to use ROI to cost justify projects, correlating to 136% more cost reductions and 268% more schedule improvements.
- √ Best-in-Class are 58% more likely than Laggards to continue to train new employees in the use of ERP after the initial implementation.
- √ Best-in-Class are 145% more likely to implement extensions as integrated modules of ERP than as separate applications.
- √ Best-in-Class are 42% more likely to be on the latest release from their ERP solution provider.

"Deploying 'out-of-the-box' doesn't mean everyone has their own box. Sometimes we have to make tough decisions to change our processes, but usually this means we improve them."

~ Managing Director, Industrial Equipment Manufacturer

At the same time, ERP solution providers continue to innovate. Without the continued commitment of management, companies run the risk of letting maintenance dollars go to waste.

- **Measure ROI of ERP projects as they are completed.** While 48% of Industry Average estimate ROI in order to cost-justify projects, only 27% actually follow up and measure the actual ROI upon completion. Best-in-Class are almost twice as likely to take this final step. Proving the value of prior projects provides added justification for future efforts.
- **Broaden and deepen ERP usage.** This recommendation has been a consistent message throughout Aberdeen's ERP benchmark reports, but results are clear: Best-in-Class manufacturers make more extensive use of ERP in terms of number of modules implemented and the percentage of available functionality deployed. And indeed we saw the gap between Average (9.9 modules, 29.8% weighted average) and Best-in-Class (11.4 modules, 29.8% weighted average) widen as the gap between Average and Laggard (9.6 modules, 27.6% weighted average) shrank. A key to being able to continue to broaden and deepen ERP usage is to take advantage of innovation provided by your ERP solution provider. Best-in-Class are 42% more likely to be on the latest release of ERP.
- **Review current levels of integration between ERP and extensions which surround it.** This year, we also saw that Best-in-Class companies are significantly more likely to have extended ERP with extended applications, making integration capabilities and open architectures even more important. Best-in-Class are more likely to tightly integrate extensions, as evidenced by the fact that they are 145% more likely to implement extensions as integrated modules of ERP than as separate applications. In comparison, Industry Average companies are 100% more likely to do just the opposite.

Best-in-Class Steps to Success

- **Improve real-time visibility to the entire quote to cash process.** A full 59% of Best-in-Class companies still do not have this level of full visibility. To be fully armed for decision-making, business users must be notified in real time as exceptions occur in order to react immediately. Currently, only 27% of the Best-in-Class have this capability. Providing direct access to enterprise data is the first step in achieving this goal. In addition, event management technologies are important tools to detect when exceptions occur. If decision-makers do not have immediate access to ERP, bring them into the ERP fold. ERP applications are far more intuitive and easy to use than ever before, removing excuses for shielding upper management from directly putting their hands on dashboards, inquiries and all sources of other business intelligence.

- **Continue to measure ROI even after it has been achieved:**
While Best-in-Class are more than twice as likely (as all others) to measure ERP at the completion of projects and continue to do so even after initial goals have been reached, more than half still take neither of these steps. Continued measurement leads to continued business value.

Aberdeen Insights — Summary

ERP has become a necessary infrastructure, yet it can also be a source of competitive differentiation. However, to turn ERP into a strategic weapon, it is necessary to take full advantage of the technology, features, and functions which continue to expand at an ever-increasing rate. New application development tools and methodologies are allowing ERP solution providers to innovate at a much more rapid pace than ever before. These new features and functions may be delivered as innovations to existing modules, making upgrades an important step in maintaining and increasing the business value derived from ERP. Operating on old releases and outdated technology while your competition is implementing these new capabilities is a sure way to lose competitive advantage.

Yet increasingly, in order to deliver the robust features and functions demanded by evolving business best practices, extensions to ERP may be required. Manufacturers today are unwilling to sacrifice functionality for reduced cost or ease of integration. Companies with Best-in-Class ERP implementations have demonstrated success through combining the best of both worlds – implementing best of breed functionality with seamless integration.

Appendix A: Research Methodology

Between April and May 2008, Aberdeen examined the use, the experiences, and the intentions of over 435 manufacturers using ERP in a diverse set of industries.

Aberdeen supplemented this online survey effort with telephone interviews with select survey respondents, gathering additional information on [RFID] strategies, experiences, and results.

Aberdeen supplemented this online survey effort with interviews with select survey respondents, gathering additional information on ERP strategies, experiences, and results.

Responding enterprises included the following:

- *Job title:* The research sample included respondents with the following job titles: CEO (7%); CFO / VP Finance / Controller (7%); CIO / VP IT (8%); EVP / SVP / VP / GM (5%); Director (10%); Manager (25%); other (26%).
- *Industry:* The research sample included respondents from the following industries: discrete manufacturing (53%); process manufacturing (24%); hybrid of discrete and process (15%, wholesales / distribution (8%).
- *Geography:* The majority of respondents (70%) were from the Americas. Remaining respondents included those from the Asia-Pacific region (11%) and Europe, the Middle East and Africa (19%).
- *Company size:* Sixteen percent (16%) of respondents were from large enterprises (annual revenues above US \$1 billion); 42% were from midsize enterprises (annual revenues between \$50 million and \$1 billion); and 42% of respondents were from small businesses (annual revenues of \$50 million or less).
- *Headcount:* Seventeen percent (17%) of respondents were from large enterprises (headcount greater than 2,500 employees); 55% were from midsize enterprises (headcount between 101 and 2,500 employees); and 28% of respondents were from small businesses (headcount between 1 and 100 employees).

Study Focus

Responding manufacturing executives completed an online survey that included questions designed to determine the following:

- √ The degree to which ERP is deployed in their operations
- √ The structure and effectiveness of existing ERP implementations
- √ Current and planned use of ERP
- √ The business benefits that have been derived from ERP initiatives

The study aimed to identify emerging best practices for ERP usage in manufacturing, and to provide a framework by which readers could assess their own management capabilities.

Table 7: The PACE Framework Key

Overview
<p>Aberdeen applies a methodology to benchmark research that evaluates the business pressures, actions, capabilities, and enablers (PACE) that indicate corporate behavior in specific business processes. These terms are defined as follows:</p> <p>Pressures — external forces that impact an organization’s market position, competitiveness, or business operations (e.g., economic, political and regulatory, technology, changing customer preferences, competitive)</p> <p>Actions — the strategic approaches that an organization takes in response to industry pressures (e.g., align the corporate business model to leverage industry opportunities, such as product / service strategy, target markets, financial strategy, go-to-market, and sales strategy)</p> <p>Capabilities — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products / services, ecosystem partners, financing)</p> <p>Enablers — the key functionality of technology solutions required to support the organization’s enabling business practices (e.g., development platform, applications, network connectivity, user interface, training and support, partner interfaces, data cleansing, and management)</p>

Source: Aberdeen Group, June 2009

Table 8: The Competitive Framework Key

Overview	
<p>The Aberdeen Competitive Framework defines enterprises as falling into one of the following three levels of practices and performance:</p> <p>Best-in-Class (20%) — Practices that are the best currently being employed and are significantly superior to the Industry Average, and result in the top industry performance.</p> <p>Industry Average (50%) — Practices that represent the average or norm, and result in average industry performance.</p> <p>Laggards (30%) — Practices that are significantly behind the average of the industry, and result in below average performance.</p>	<p>In the following categories:</p> <p>Process — What is the scope of process standardization? What is the efficiency and effectiveness of this process?</p> <p>Organization — How is your company currently organized to manage and optimize this particular process?</p> <p>Knowledge — What visibility do you have into key data and intelligence required to manage this process?</p> <p>Technology — What level of automation have you used to support this process? How is this automation integrated and aligned?</p> <p>Performance — What do you measure? How frequently? What’s your actual performance?</p>

Source: Aberdeen Group, June 2009

Table 9: The Relationship Between PACE and the Competitive Framework

PACE and the Competitive Framework – How They Interact
<p>Aberdeen research indicates that companies that identify the most influential pressures and take the most transformational and effective actions are most likely to achieve superior performance. The level of competitive performance that a company achieves is strongly determined by the PACE choices that they make and how well they execute those decisions.</p>

Source: Aberdeen Group, June 2009

Appendix B: Related Aberdeen Research

Related Aberdeen Group research that forms a companion or reference to this report includes:

- [2008 ERP in Manufacturing Benchmark Report](#); June 2008
- [2007 ERP in Manufacturing Benchmark](#); July 2007
- [2006 ERP in Manufacturing Benchmark Report](#); August 2006
- [The Order-to-Cash Cycle: Integrating Business Processes to Improve Operational Performance](#); March 2008
- [ERP in Complex Manufacturing: Improving Collaboration and Visibility](#); December 2008
- [ERP Plus in Process Industries: Beyond Compliance](#); November 2008
- [Measuring the ROI of ERP in SMB: Keeping ERP Projects Alive When You Need Them the Most](#); March 2009
- [ERP in Industrial Machinery and Components Manufacturing](#); November 2007
- [2008 ERP in the Mid-Market](#); August 2008

Information on these and any other Aberdeen publications can be found at www.aberdeen.com.

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