



Aberdeen *Group*

Enterprise Service Bus and SOA Middleware

Next Steps in SOA Series

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Executive Summary

An enterprise service bus (ESB) is messaging middleware that provides the secure interoperability and message transport services between application “services” in a service oriented architecture (SOA) computing environment. In researching ESB adoption, Aberdeen hypothesized that since an ESB provides the SOA “highway” infrastructure, its adoption is a proxy for overall market adoption of SOA technology. This report details the findings and analysis of a recent ESB and SOA middleware benchmark survey, providing new insights into the maturation of SOA adoption at mid-2006.

Key Business Value Findings

Users are splitting into three technology camps, which we label *SOA Lite*, *SOA ERP*, and *SOA Enterprise*.

- **SOA Lite** is for users who are primarily deploying web services that do not require mission-critical capabilities such as high-volume scalability, high availability and failover, management, governance, and security.
- **SOA ERP** is used by companies that are choosing to deploy SOA surrounding their ERP application software.
- **Enterprise SOA** requires and uses mission-critical SOA middleware capabilities.

The overall adoption rate of SOA technology is very robust, with 90% of survey respondents saying they will exit 2006 with experience in SOA planning, design, or programming under their belts.

Company size plays a large role in differentiating SOA technology experience; about 20% of enterprise-size organizations (greater than \$1 billion in revenue) have more than a year’s experience with SOA programming, compared with only about 6% of mid-size organizations (\$50 million to \$1 billion). Almost 80% of small companies have no immediate plans to start SOA programming, and only 3% have more than a year’s experience.

SOA Lite

SOA Lite categorization is justified by the fact that nearly half of companies surveyed say they have no plans to start using an ESB, while only 11% have more than a year’s experience using ESB software. This category, dominated by small-to-mid-size companies and Microsoft .Net users, is predominantly focused on light-weight Web services. *SOA Lite* is most often implemented using open source software, such as that created with the Eclipse integrated development environment, UDDI registry, SOAP, AJAX, and WS-* standards.



Enterprise SOA

Enterprise SOA is synonymous with large enterprises (annual revenue of at least \$1 billion). These companies have been using SOA technology for at least a year, have complex integration issues, have the most to gain from the benefits of SOA, and typically set high standards for uptime and recoverability. Enterprise SOA incorporates the greatest functionality in adapting to cross-platforms, integration flexibility (especially with legacy EAI investments), ESB suite and SOA suite functionality, and mission-critical volume and uptime capabilities.

There are technology challenges to *Enterprise SOA*. Half of the respondents report concerns with scaling to production volumes, reliability, and scalability; creating a metadata repository/registry for ESB data elements; and establishing ESB security, governance, and management. The services and organizational strategies to overcome the technology challenges are to slow the pace of mission-critical adoption, beef up internal training and technology teaming, and use outside services in a “learn-while-doing” fashion, in which contractors work side-by-side with internal IT practitioners. Complicating the learning curve is the fact that while half are implementing SOA using a Java-based J2EE environment, about one-third are implementing on both the Java and Microsoft.Net platforms.

SOA ERP

One-sixth of respondents view SAP applications bundled with NetWeaver SOA technology as a primary SOA vendor. (Oracle does slightly better but sells its Fusion SOA middleware as a standalone and with its applications, making direct comparisons impossible). We conclude that a significant minority of companies — especially mid-size organizations — will use the SOA integration capabilities built into the latest versions of ERP vendors’ application products in two fashions:

- As the preferred integration way *into* the applications; and,
- As a low-cost SOA toolkit for integration from the ERP applications *out* to other applications and processes.

Virtually every application software company Aberdeen follows has an SOA enablement development program delivered or underway.

Implications & Analysis

SOA Adoption

SOA is a major technology wave driven by the unbearable costs of technology integration, which is programmer labor-intensive. By making it easier to integrate line of business-mandated process changes, IT is embracing SOA as a long-term cost-reducer and tool to accelerate time-to-market.

In comparison with previous information technology adoption cycles, SOA’s rush into early adoption is remarkable. Yet SOA adoption in general and ESB in specific are not dramatically changing historic IT software buying patterns. Here are the primary SOA vendor and primary ESB choices for installed products:

- The incumbent enterprise application integration (EAI) vendors, BEA Systems and webMethods, are the “primary SOA vendor” leader and number three, re-



spectively. Half of the respondents and two-thirds of Best in Class companies are considering EAI side-by-side with ESB purchases. Thus, older EAI technology and SOA are co-existing. In the case of BEA, the company has both an EAI product line and the complete AquaLogic suite of SOA middleware products. In the case of webMethods and Tibco, buyers are attracted to ESB-like capabilities without buying a pure SOA ESB.

- Oracle and SAP have a combined 19% “primary vendor” designation, an indication that *SOA ERP* appeals to a definable class of SOA adopters.
- .Net makes Microsoft the primary vendor only for the 10% who use .Net alone, not for the one-third who use both Java and .Net.
- IBM has the highest primary vendor recognition in pure SOA technology and in ESBs, while Fiorano and Iona are the leading choices in pure-play ESBs.

ESB Deployments Match a Robust SOA Rollout

Using Aberdeen’s PACE framework, the overall survey group is driven to deploy ESBs and SOA technology to reduce IT complexity — and the costs of complexity — and the need to speed IT implementations, while Best in Class (BIC) organizations are driven by the needs to align with the business and re-use applications via Web services.

ESB adoption is a large enterprise phenomenon, with only about 7% of large companies saying they have no plans to start using an ESB in their SOA rollouts. However, the majority of mid-size organizations and almost 80% of small companies have no plans to use ESBs, yet they are already designing and programming SOA applications. These data indicate that smaller companies are adopting the *standards* of SOA and the related programming, but are not yet ready to adopt an SOA style of development for mission-critical applications — or they will rely on *SOA ERP* to close the technology gap.

About 60% of survey respondents are creating composite applications that support Web service applications, with more than one-third planning customer-facing B2C applications connected to back-office applications.

An eye-opening 46% will deliver more than three major application integration projects using SOA in 2006. This implies a strong and rapid adoption of SOA technology within IT organizations, combined with a list of funded projects that can benefit from a services-oriented technology integration approach. This is not business as usual.

More than three-quarters of the ESBs are deployed at companies that describe themselves as *centralized* by geography, business unit, IT, or enterprise-wide.

Overall, respondents report plans to deploy between 3,700 and 5,500 servers for edge applications and between 2,700 and 4,500 at datacenters. The implication is that servers running ESB — and the rest of the SOA software stack — are beginning to create demand for enterprise server hardware purchases. We believe SOA will drive significant hardware purchases since the SOA value equation essentially trades off computing inefficiency (e.g., XML) for higher labor productivity. At this point in the history of computing, trading hardware and SOA software for programmer labor is the right approach for both short- and long-term value generation.



Respondents' enterprises considered ESBs alongside substitute technologies: EAI, business process management (BPM), and IBM Message Queue or CORBA message brokers, in that order. Buying evaluations are driven by ease of integration flexibility with current and planned applications; ESB business process control, change, management, government, and life-cycle capabilities; and the completeness of the ESB product's offering (commonly called an ESB suite).

The key factors in buying decisions are overall technical attractiveness, ROI/ROA projections, and installation services. Slightly less than half of the survey respondents' organizations plan to standardize on SOA software from a single vendor. About the same percentage will employ a best-of-breed strategy with ESB and other SOA software purchases, believing industry standards for SOA will minimize integration risks. We believe both approaches have merits.

Recommendations for Action

SOA is a long-term technological journey and decisions with consequences must be made along the way. We are at a juncture in which companies must consider and decide whether they will conscientiously head down the *SOA Lite*, *SOA Enterprise*, or *SOA ERP* road. Backtracking later will add costs and delays.

SOA middleware is often deployed as a suite consisting of an application server, ESB, repository/registry, security, and management/governance. We believe IT practitioners are making the right choice by investing in SOA suites, primarily because it will be costly to go back later and retrofit already-developed applications with SOA products, such as security and governance. However, the market for SOA suite products is still maturing, and buyers tell us that a best-of-breed product strategy for selecting an SOA suite has merits, as well as the SOA suite approach.

We concur with respondents' decisions to preserve their existing EAI middleware investments while moving forward with SOA technology, rather than rip and replace EAI middleware.

Given the lack of hands-on experience using SOA technology such as ESBs, engaging outside services to complement the efforts of an in-house project team is an effective way for the team to "learn-while-doing".

Laggards within Aberdeen's Competitive Framework for this report need to get on the SOA bandwagon, while Industry Average enterprises should choose either an SOA Enterprise or ERP SOA approach.



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Chapter One: Issue at Hand

Key Takeaways

- Existing application integration technology is too complex, resource-consuming, and slow-to-implement to keep up with business process changes.
- SOA technology from both application ISVs and development/middleware companies is the preferred technology base for solving the application integration problem.
- ESB is not the first of many successive SOA products to be deployed. It is often deployed with a suite of SOA middleware products.

An enterprise service bus (ESB) is messaging middleware that provides the secure interoperability and message transport services between application “services” in a service oriented architecture (SOA) computing environment via XML, Web services interfaces, messaging adopters, and rules-based routing. In researching ESB adoption, Aberdeen also gathered considerable new insights into the maturation of other SOA middleware at mid-2006.

SOA Solves IT Integration Cost and Complexity Problems

There are significant benefits in successfully implementing application integration in support of business process change. The differences in application software maintenance costs, which include process-based IT changes, are more than 11% of the IT budget between Best in Class and Industry Average organizations. Given \$1.3 trillion in global enterprise IT spending in 2006, the business value on the table is an eye-popping \$143 billion a year, so a modest and achievable 16% improvement by Industry Average and Laggard enterprises toward becoming Best in Class results in \$23.4 billion a year in business value.

In late 2005 and into 2006, Aberdeen studies explored many challenges enterprises face in keeping up with, integrating, and paying for the complex changes enterprises need constantly to keep business processes efficient and competitive. For example, in the *Achieving More Value from Enterprise Applications* benchmark survey, between 40% and 50% of respondents said redesigning business processes, high related integration costs, and customization-related IT challenges were major application integration stumbling blocks.

The data in Figure 1 also typifies the responses Aberdeen received in research documented in *SOA in the Supply Chain*, *SOA in IT*, and *The Product Quality Benchmark* of manufacturers. It has been proven statistically that the cost and agility needed to keep up with business process changes driven by lines of business is a C-level opportunity for improvement. Based on the huge 11% of IT budget gap between process- and technol-

Competitive Framework Key

The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of practices and performance:

Laggards (30%) —practices that are significantly behind the average of the industry

Industry norm (50%) — practices that represent the average or norm

Best in class (20%) — practices that are the best currently being employed and significantly superior to the industry norm

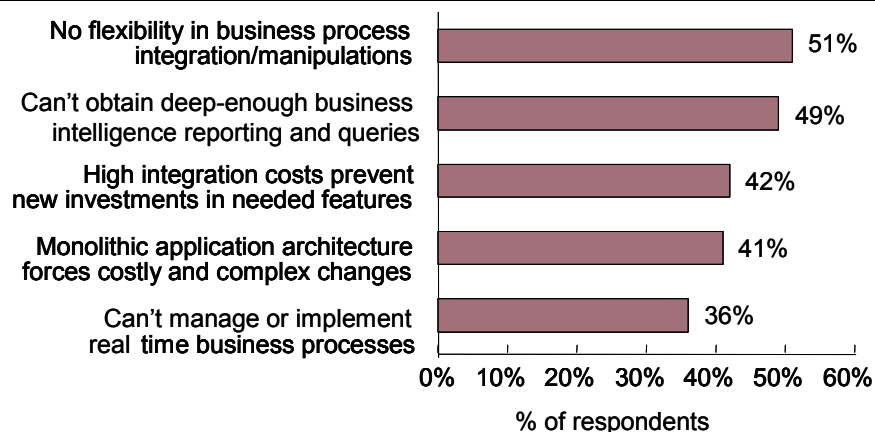


ogy-disciplined Best in Class and Industry Average organizations, the issue should be high on the executive agenda.

There are two major starting points for generating more value through improved integration efficiency at most enterprises:

- Many business processes are spread across several application “silos,” making integration tough to begin with. The solution is *composite* applications that create an SOA service from pieces of several existing applications; and,
- Prior technology such as enterprise application integration (EAI) software got the job done once but has proven very expensive to maintain in terms of programmer labor. SOA technology is not only connecting back to EAI and other existing integration software but is also enabling new software development to integrate business processes in different ways in a fashion that is faster and less labor-intensive to create and simpler and hence lower cost to change and maintain.

Figure 1: Application Integration Stumbling Blocks



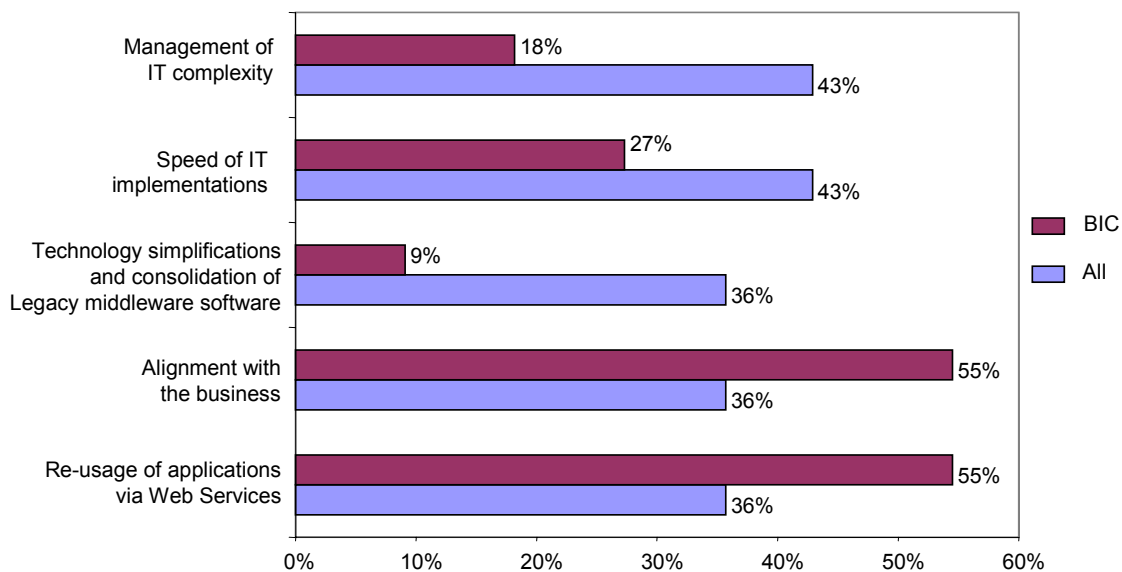
Source: AberdeenGroup, June 2006

ESB technology is supplementing EAI and related integration technologies with communications connectors, business-process orchestration and management, and life-cycle management capabilities that are proving to lower the complexity and costs of initial integration as well as ongoing changes because SOA adopters are — finally — widely achieving “reusability” of integration software investments.

The SOA Middleware Market is Already Disparate

Figure 2 shows the factors driving adoption of ESB and SOA middleware technology. This graph illustrates the disparate nature of the SOA market, even though the vast majority of companies have less than a year’s experience with ESB technology. Overall, the top drivers are managing IT complexity and speeding up the delivery of IT applications and changes. However, the 20% of Best in Class respondents in Aberdeen’s competitive framework are focused on aligning with the business and re-using existing applications as Web services.

Figure 2: ESB Adoption Drivers (Multiple Choice)



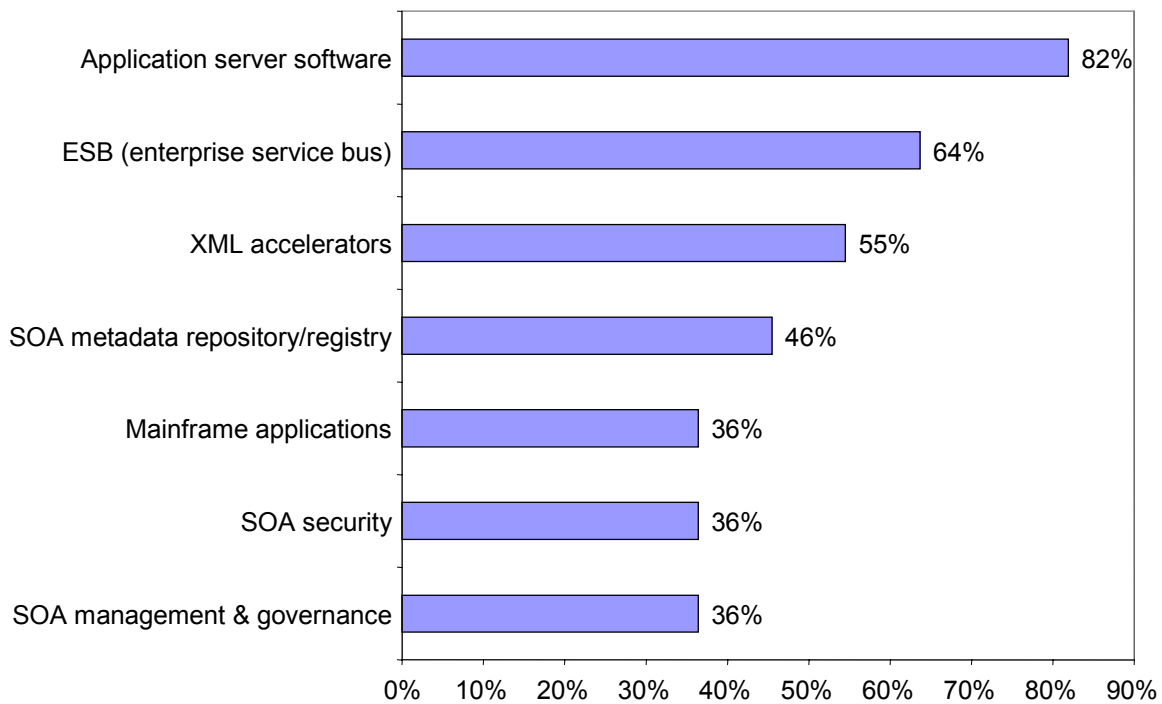
Source: AberdeenGroup, June 2006

ESB Products are Often Installed in an SOA Suite

Figure 3 illustrates the percentage of survey participants who had deployed specific SOA technologies. While about 64% have deployed ESB software, 46% also have metadata repositories/registries and 36% have security, management and governance products deployed. Telephone interviews indicate those who are deploying multiple products at once are conscientiously trading off initially steeper learning curves for lower integration costs later.



Figure 3: SOA Middleware Presently Deployed



Source: AberdeenGroup, June 2006

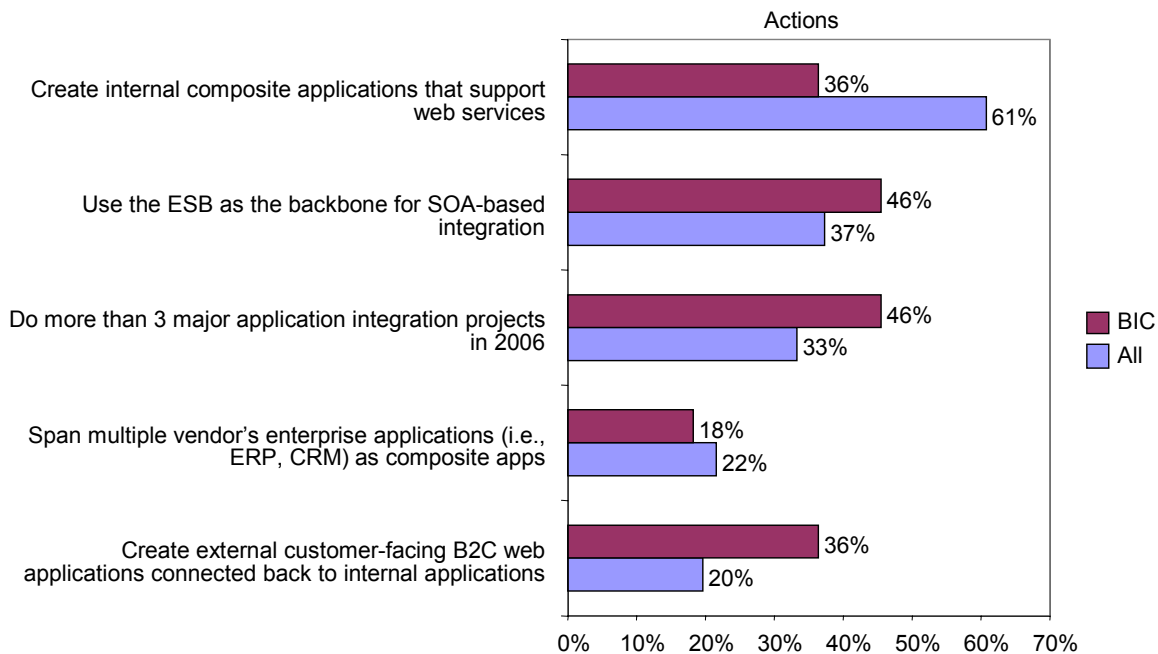
Chapter Two: Key Business Value Findings

Key Takeaways

- More than 90% of respondents are rapidly scaling the SOA adoption curve in 2006.
- ESB technology is complementing, not replacing, EAI technology.
- Enterprise ESB issues related to integration with registry/repository and scaling to high volumes are the greatest challenges ESB practitioners face.

Technicians are rapidly absorbing the technology behind SOA application development and moving into deployment. By the end of 2006, the 90% of organizations that intend to adopt SOA will be at the programming stage.

Figure 4: Strategic Actions Enterprises Are Undertaking for SOA (Multiple Choice)



Source: AberdeenGroup, June 2006

Figure 4 depicts the actions enterprises are undertaking in response to the drivers in Figure 2. The overall population is rushing to create composite applications that better mimic the needs of business processes, which often span applications. Best in Class organizations are using ESBs to create enterprise-wide “SOA highways.”



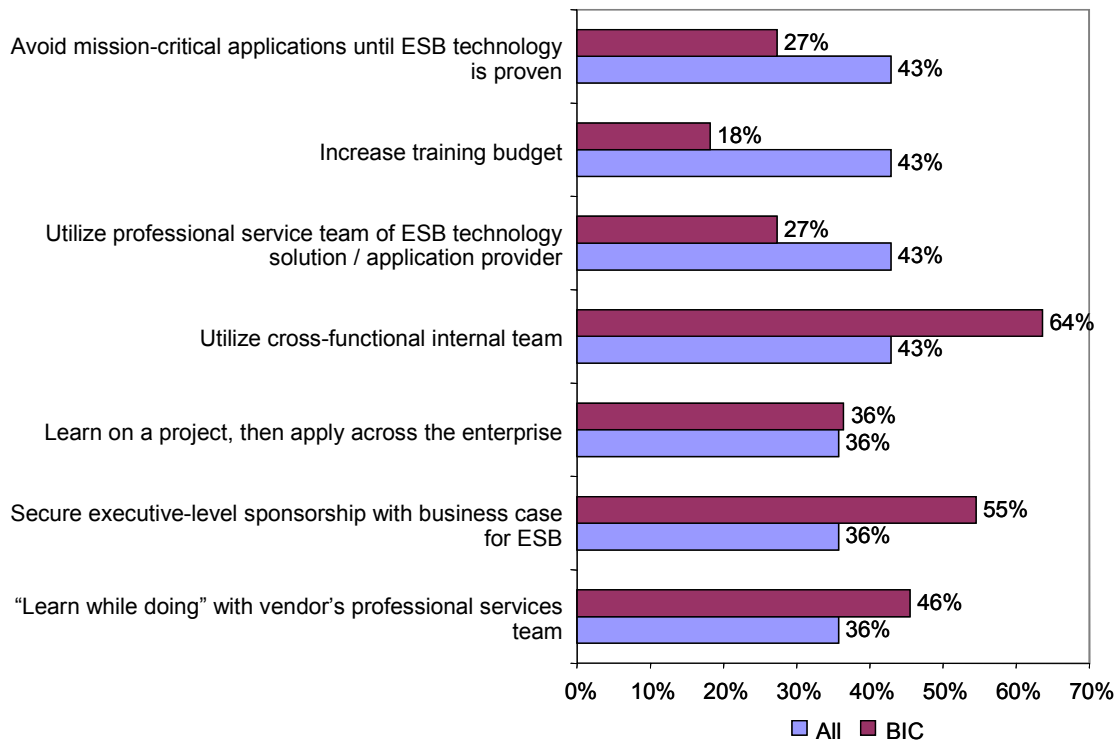
Importantly, the adoption of SOA is robust: 46% of the Best in Class and a third of the overall sample in Figure 3 plan on undertaking at least four major application integration projects in 2006. The implications are:

- That the SOA technology curve is not particularly difficult to surmount;
- The backlog of SOA-enhanced integration projects is long; and
- SOA development across the enterprise is in full swing.

Organizational and Services Strategies

The most common approach to development and deployment is to use a cross-functional team of SOA architects, systems programmers, programmers, and business process analysts (Figure 5), which 64% of Best in Class organizations are using. The BIC are also “learning while doing” by working beside more expert outside services consultants and technicians. The overall sample is also looking to buy outside services and to increase internal training budgets. Finally, the companies most focused on *Enterprise SOA* are proceeding cautiously to production, looking to ensure that mission-critical applications will meet service-level agreements on uptime and response times under load.

Figure 5: Organizational and Services Strategies



Source: AberdeenGroup, June 2006

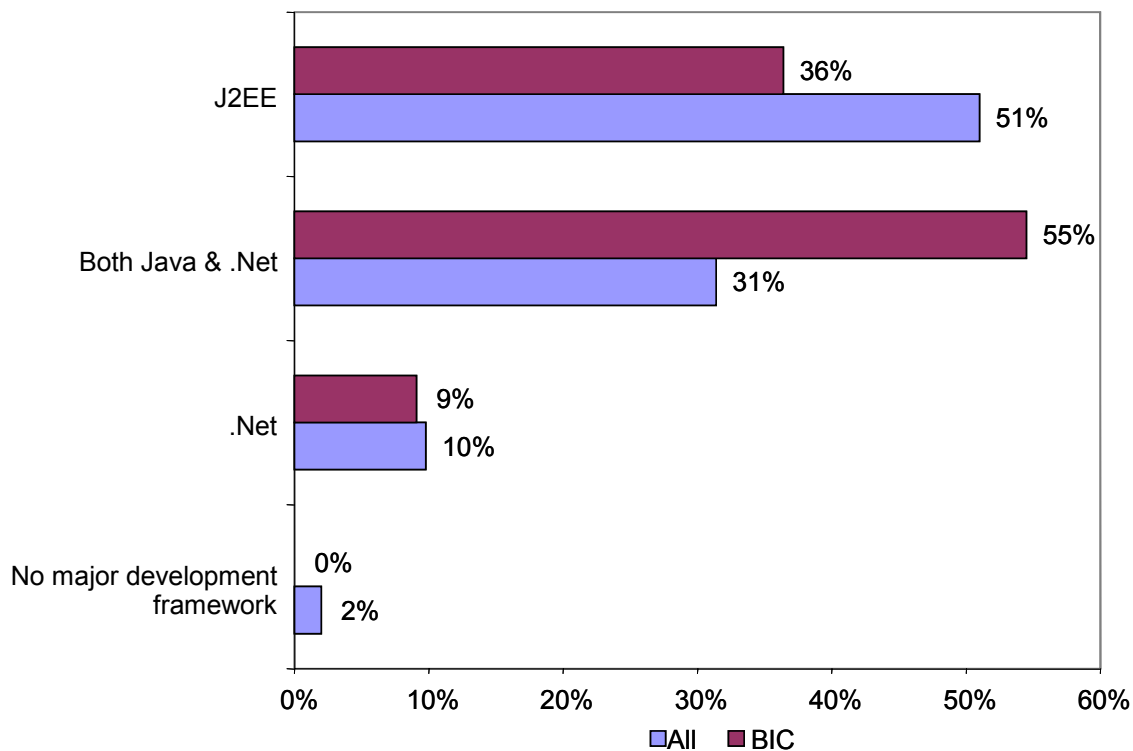
Coping With Multiple Frameworks and Platforms

More than half of the overall survey pool and 36% of the BIC group are using Java as their target SOA development framework (Figure 6), compared with only 10% dedicated to Microsoft's .Net framework. Importantly, 55% of the BIC and 31% of the overall survey group are planning deployments across *both* frameworks. However, it requires careful selection of programming tools to develop for both frameworks with a common development environment.

Java-only sites are planning deployments to more servers than .Net sites by about 2 to 1. Reflecting the importance of SOA to large enterprises, almost two-fifths plan SOA applications involving their mainframes. Overall, our survey identified deployment plans for at least 3,700 to 5,500 Edge servers and 2,700 to 4,600 data center servers. Clearly, SOA plays a significant integration role on the "edge," — the customer- and operations-facing distributed computing activities of an enterprise — such as warehouse management with RFID, retail stores, insurance agencies, and manufacturing shop floors.

More than 40% will employ best-of-breed strategies with both ESB and SOA products, believing the strong adoption of industry standards within SOA technology will make best-of-breed integration risk low. One-third will standardize on a single ESB product and deploy it widely.

Figure 6: SOA Target Frameworks



Source: AberdeenGroup, June 2006



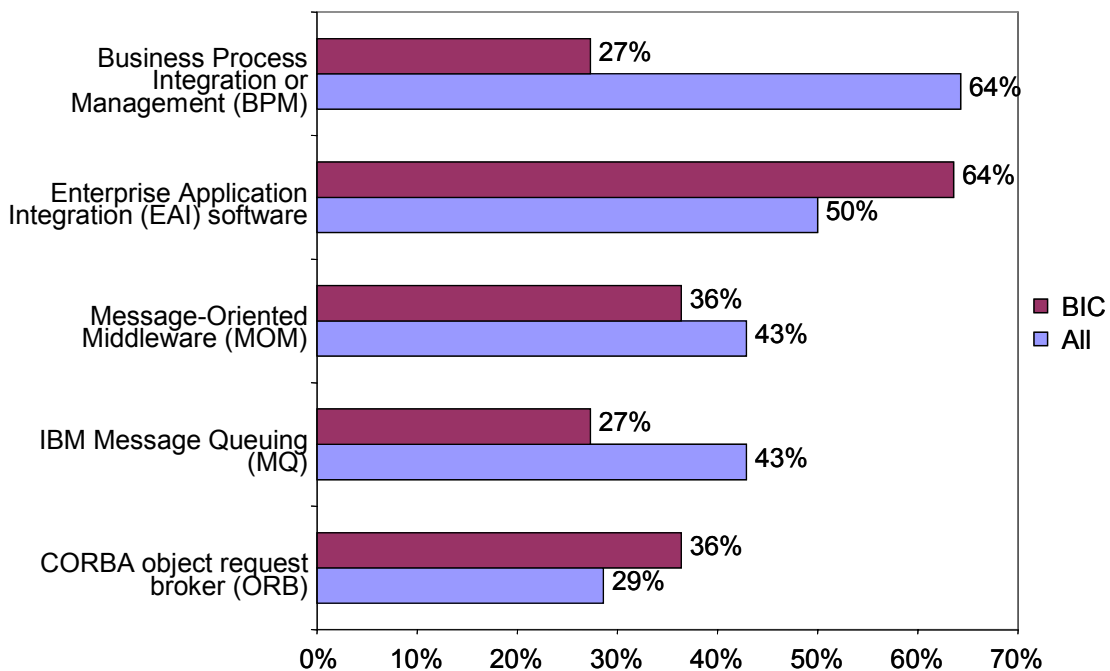
ESB Complements and Competition

ESB technology is being ignored by nearly half the survey pool, pushing those companies toward an *SOA Lite* direction (Figure 7). Of the half that chose an ESB, 64% of the overall survey group considered a business process integration or business process management (BPM) software product. Many of today's ESBs have strong business process orchestration capabilities built in, offering buyers an alternative technology to standalone BPM software packages.

About 64% of BIC organizations and half the overall survey chose ESBs over EAI products, while less than half looked at message-oriented middleware, IBM's message queuing (MQ) products, or the standards-based CORBA object request broker (ORB).

However, the picture is not all about competition. Quite the opposite, as illustrated in Figure 8. BEA Systems and webMethods, two EAI companies, sandwich IBM for the top three choices as primary SOA vendors. webMethods, for example, does not offer an ESB per se, but its products perform the functions of an ESB. "Functional equivalency" by trusted EAI suppliers is protecting the EAI investments at many companies, especially large enterprises.

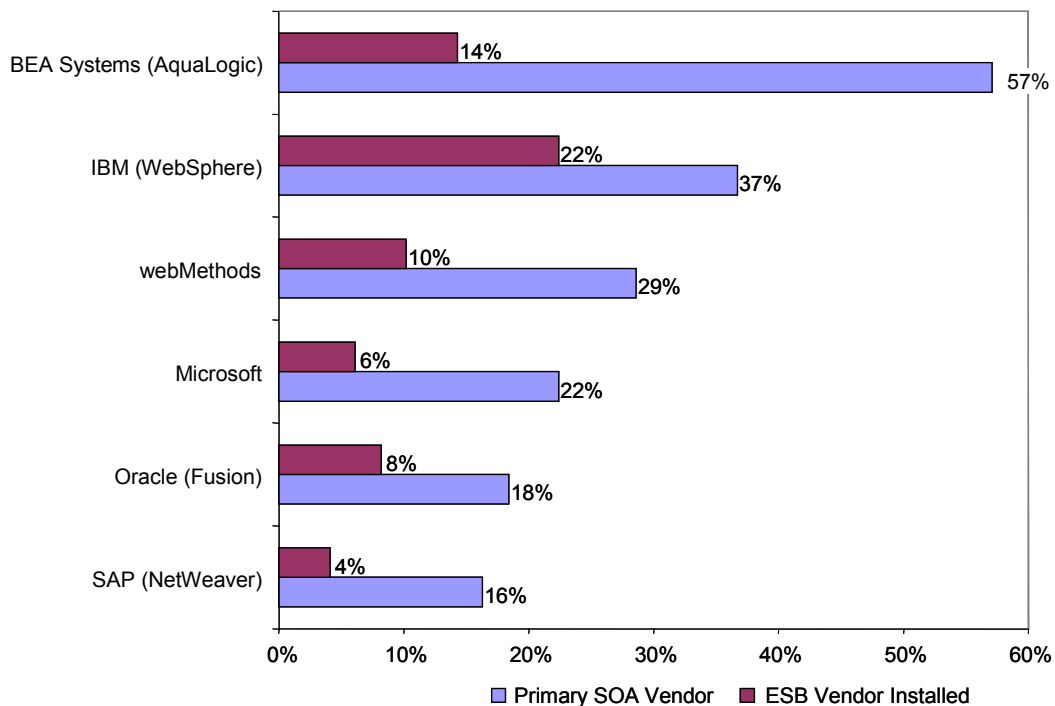
Figure 7: Other Technologies Considered in ESB Selection



Source: AberdeenGroup, June 2006



Figure 8: Primary ESB and Primary SOA Vendor (Multiple Choice)



Source: AberdeenGroup, June 2006

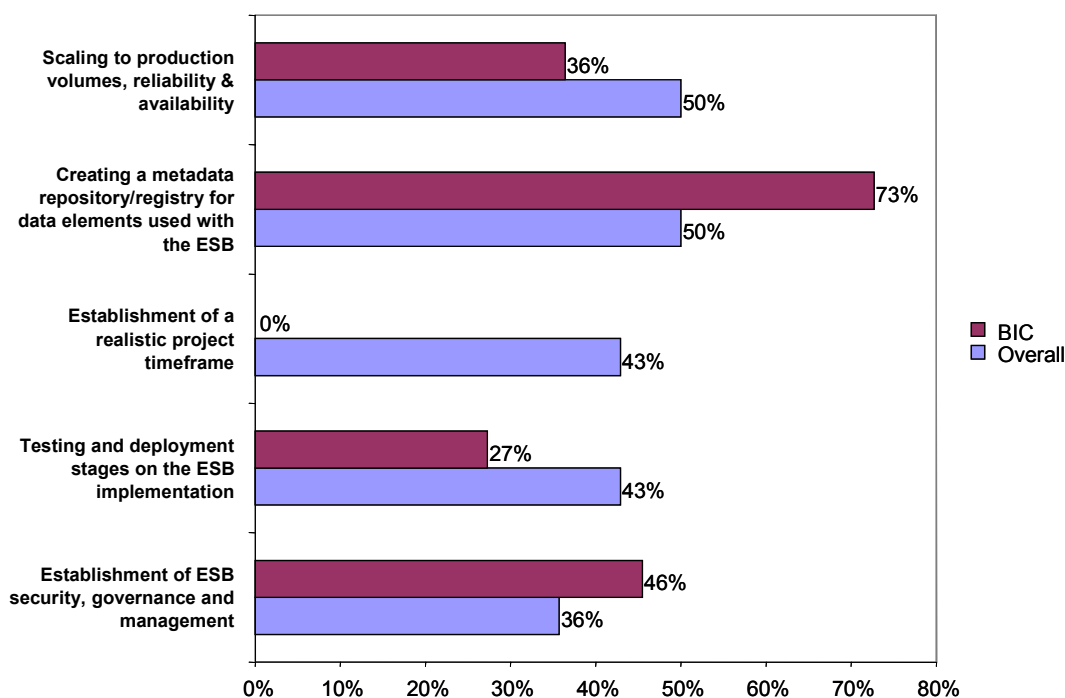
Getting to ESB Deployment Has Challenges

The vast majority of companies implementing ESBs take in more than \$500 million in revenue annually. Figure 9 illustrates the major challenges respondents encountered in implementing ESBs. *Creating a metadata repository or (UDDI) registry* stymied half the survey pool — and 73% of the BIC. Next, a common mistake is *underestimating the time and effort required to populate the repository/registry* with the service rules needed by the ESB for regulating services. Finally, about half the overall population and 36% of the BIC had difficulty scaling to production volumes and with service-level issues such as availability and reliability. Underestimating the hardware resources required to scale out a medium to large SOA implementation is a common challenge, and somewhat understandable given most practitioners' lack of experience.

Other challenges were encountered by less than half of the survey group, but are worth discussing. None of the BIC, but 43% of the overall survey, report *difficulty in establishing a realistic project schedule*. This comes from inexperience and is not a long-term problem. Testing and deployment is also problematic for a significant minority due to inexperience, the complexity of the service-registry-ESB interaction, and a dearth of testing tools. Lastly, 46% of the BIC and 36% of all respondents challenges in establishing security, governance, and management of an ESB. Security and management can be solved with SOA point products, while governance involves organizational issues related to ESB control, especially in the large number of distributed computing applications planned, and should be addressed at the design stage.



Figure 9: ESB Technology Stumbling Blocks (Multiple Choice)



Source: AberdeenGroup, June 2006

Conclusions on the Business Value of ESB

Large companies are clearly voting with their wallets to buy and deploy ESBs, and they are the most likely to have more than a year's experience in programming with SOA technology.

By focusing on creating composites of multiple software applications, practitioners are dealing with a major issue outlined in our recent benchmark study, [Achieving More Value with Enterprise Applications](#): Today's business processes span multiple software application silos.

The aggressive plans of a significant minority to tackle four or more major SOA applications indicates that practitioners are confident in their ability to execute, have a clear plan of attack, and are moving aggressively to deploy SOA-enabled applications to drive value in their organizations.

The qualitative data we gathered on SOA performance metrics during this study indicate organizations are reducing application maintenance costs as a percentage of the IT budget and increasing the percentage allocated to line-of-business innovation — 5% would be an initial planning goal. Notably, those two metrics weigh heavily in Aberdeen's determination of which organizations are Best in Class. Thus, we now have qualitative data that suggest SOA is delivering measurable business value to the IT department, and we have no doubt that SOA applications are delivering value to the line-of-business units.

Chapter Three: Implications & Analysis

Key Takeaways

- The market is bifurcating into those who are using open standards but not SOA middleware products, and those mostly large companies who are seeking heavy-duty SOA middleware for mission-critical applications.
- SOA middleware is not a replacement for EAI or other technologies, but rather a supplement.
- “Ease of integration flexibility with current and planned applications” is the most frequently-mentioned buying criteria.

As shown in Table 1, survey respondents fell into one of three segments — Laggard, Industry Average, or Best in Class based on Aberdeen’s model for IT organizations that weights the cost of application maintenance as a percentage of IT budget and the percent of the IT budget that spent on delivering innovations to the LOB.

The three segments are further analyzed based on their characteristics in four key categories:

- (1) **Process** (application maturity and experience, success with application integration, discipline in measuring business value);
- (2) **Organization** (corporate focus/philosophy, level of collaboration among stakeholders, IT organization’s focus and the level of centralization);
- (3) **Technical maturity** (competency in performing application integration, ability to complete integration in-house); and
- (4) **Technology** (application modernity, functional adequacy, discipline in maintenance).

Table 1: SOA Adoption Competitive Framework

	Laggards	Industry Average	Best in Class
Process	Recent adopter of modern applications. Little experience in integration. ROI seldom measured.	Looks at SOA as cost-cutter, not process-improver. ROI planned before project.	Considerable experience and integration process is successful. Management by KPMs and SLAs.
Organization	Business focus on inventory management, revenue growth, and process standardization. Highly centralized.	Focus on order fulfillment, CRM, real-time visibility. Beginning to implement SOA for composite applications.	IT is decentralized and especially LOB-focused. Service-oriented. SOA viewed as new process enabler.



	Laggards	Industry Average	Best in Class
Technical Maturity	No plans for SOA. Low competency leads to high costs, delays, delivery inconsistency. Needs outside help.	Modest competency. SOA plans but no ESB plans. High maintenance costs. May need outside help. Under 12 months SOA programming.	More than 12 months SOA programming experience. Work done internally or side-by-side with outside experts. SOA architect in place.
Technology	Applications antiquated and inadequate. Customizations are poorly documented. No ESB or SOA infrastructure plans.	Project-oriented point purchases, SOA Lite or SOA ERP. Low-volume, low-complexity SOA like Web services. No ESB or other SOA middle-ware.	Well-documented and managed. Full SOA suite deployed. Anticipating scaling and availability issues.

Source: AberdeenGroup, June 2006

Process and Organization

- In the process category, Best in Class firms that have low maintenance costs as a percentage of IT budget also show high innovation rates and considerable discipline in IT process management. Many are already quite experienced with SOA technology, and SOA business value benefits for lower IT application development and maintenance costs and faster IT delivery are showing up in performance metrics. Laggards are twice as likely to be focused on IT integration costs as the BIC, while Laggards are one-fifth as likely to be mature enough to be focused on IT operating costs as the BIC.
- Organizationally, the BIC IT shop is organized and staffed with specialists and generalists who are brought together into multi-disciplinary teams for SOA projects. Outside services are engaged where necessary, but internal staff work along-side the contractors in order to “learn-by-doing” skills transfer. BIC are disciplined and focused on continually responding to LOB changes and optimizations. Laggards focus on unsophisticated business metrics such as revenue growth. They tend to be highly centralized but least able to cope with change. For example, they seldom measure business value before or after implementing a project.

Technical Maturity and Technology Usage

- BIC have superior IT processes and talent, enabling them to show no significant challenge in managing the application integration process or the technologies involved.
- Average and Laggard organizations are most likely to adopt *SOA Lite* and *SOA ERP*. Average organizations have a propensity to be a version or more behind the ISV’s latest release. Since SOA and other new technologies are most likely in the latest releases, Average and Laggard organizations will be unable to leverage the flexibility of SOA technology – a widening gap between SOA-enabled haves and have-nots is a point of technology differentiation.



- The majority of Average and Laggard enterprises have no plans to adopt ESBs or other components of an SOA suite in 2006. They may see the wisdom of adopting SOA middleware after deploying more applications or when confronted by the integration limitations of Web services without the support of SOA middleware.
- BIC enterprises are most likely to be challenged by complex SOA implementation issues such as scaling to production volumes and achieving high-availability across a distributed SOA infrastructure. Clearly, many BIC organizations have taken the technology further and pushed it. Average and Laggards will have to anticipate the lessons learned.
- BIC are more likely to use IBM WebSphere and/or EAI products from BEA Systems or webMethods. Average organizations are more likely to choose *SOA ERP* from the likes of Oracle or SAP, or a best-of-breed ESB.
- Over 80% of BIC will buy an ESB based on ROI across multiple projects; BIC are buying SOA infrastructure with a goal of cross-company deployment while Average and Laggards are still focused on individual project-based ROI.

ESB Purchase Factors

ESBs are being purchased primarily by large enterprises and BIC IT organizations. Table 2 shows the factors important to an ESB buying decision as chosen by the majority of respondents, and where we are overweighting *Very Important* over *Important*.

The number one weighted factor is the ease of integration flexibility with current and planned applications. Respondents told us that since large enterprises have considerable investments in EAI technology, they cannot afford to rip-and-replace EAI with SOA; SOA must co-exist with EAI technology.

The number two factor is completeness of the ESB “suite.” This factor indicates buyers do not want lightweight ESB technology, but are looking for integrated capabilities for BPM, service management and governance, and service life-cycle features such as change management. The high rating of this factor reflects that mostly large-enterprise buyers are selecting enterprise-class ESB products, rather than less capable products that might suffice for a single application project but could not be later scaled up to enterprise-class levels. This is sophisticated buyer behavior fairly early in the adoption cycle.

The remaining factors are all clustered closely together and may safely be viewed as a group. Many of these can be tied to the first and second place factors: ease of integration/EAI and a robust ESB suite.

What ESB buyers are *not* interested in is open source ESB technology.

**Table 2: Factors in ESB Purchase Decision**

Weighted importance of specific drivers for the ESB technology decision			
	<i>Very Important</i>	<i>Somewhat Important</i>	<i>Not Important</i>
Ease of integration flexibility with current and planned applications	43%	25%	0%
ESB business process control, change, management, governance, and life-cycle features	29%	35%	6%
Completeness of vendor's SOA product offering	20%	43%	4%
Completeness of vendor's ESB product offering (e.g., suite)	20%	43%	4%
ESB security features	25%	37%	6%
ESB features protect our organization's legacy middleware investments	29%	31%	8%
ESB scalability, robustness, reliability, clustering, and fail-over features	25%	35%	4%
ESB process modeling and BPEL capabilities	20%	39%	8%
Extensive range of ESB communications connectors and transport options	22%	35%	12%
ESB business process orchestration capabilities	22%	35%	8%
ESB compliance with industry standards	12%	47%	6%
Proven ability of ESB to sustain high volumes in production	20%	35%	12%
ESB mediation capabilities	18%	37%	8%
ESB development environment	20%	33%	10%
ESB is tightly integrated with vendor's other SOA technology	22%	29%	10%
ESB is tightly integrated with vendor's ERP applications	14%	35%	12%

Source: AberdeenGroup, June 2006

Challenges and Solutions Differ by Company Size

Companies are overcoming challenges with responses that differ by company size as measured by revenue (Figure 10) with responses (Figure 11).

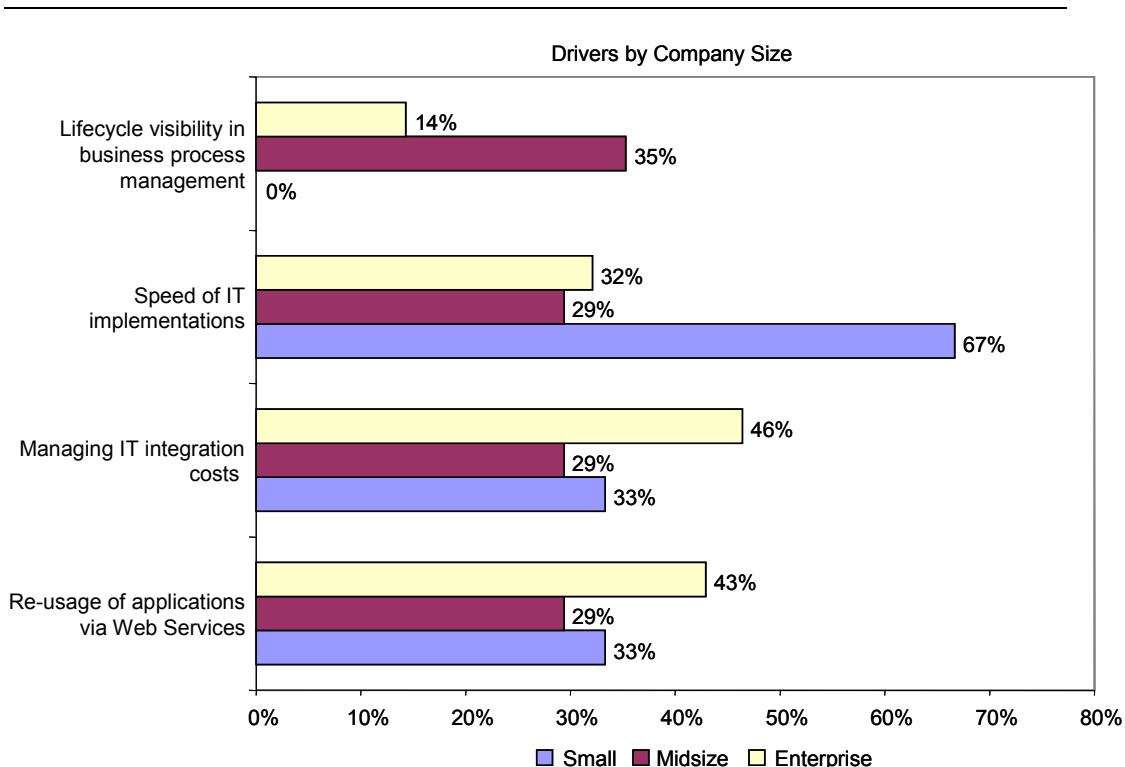
Small Companies with less than \$50 Million in Revenue

About one-third of small companies are starting their SOA journey at the planning and design stage in 2006 and almost 30% will not have reached the programming stage this year. For whatever reason, three-quarters of small companies have no plans to buy and ESB or related SOA middleware. Small companies are fixated on the speed of IT implementations. When buying an ESB, small companies look first for completeness of the SOA suite, and next for tight integration of the ESB into the overall SOA suite. More than larger companies, those under \$50 million, will look to the ESB as the backbone for ESB integration. They will invariably use Microsoft Windows as a framework, and a few will have Java too. Small companies are highly likely to use outside services for SOA implementations, especially via local VARs. When they choose, small companies will single-source SOA and ESB technology from a single vendor.

Medium Companies with \$50M to \$1B in Revenues

A quarter of mid-size companies will get started in SOA planning and design this year, and less than a fifth have more than a year's experience. Figure 9 shows a variety of challenges, with creating composite applications with Web services being the most frequent response to the challenges. We expect *SOA Lite* to be a common model among mid-size companies, as will *SOA ERP* due to the time, talent, and budget constraints at many mid-size firms. A quarter of mid-size firms will do B2B applications this year, and

Figure 10: Challenges and Responses by Company Size



Source: AberdeenGroup, June 2006

30% will do B2C. About 40% say they will do more than 3 projects this year — and recall that a quarter are just getting started in SOA. Composite applications are the most frequently chosen action. The primary competitor technology to ESB was EAI. Unix, Linux, and Windows are the platforms chosen, with some mainframes. Medium-size companies are unlikely to outsource ESB implementations, but half will work along side outside SOA experts on initial implementations. A majority plan to standardize on SOA software from a single vendor.

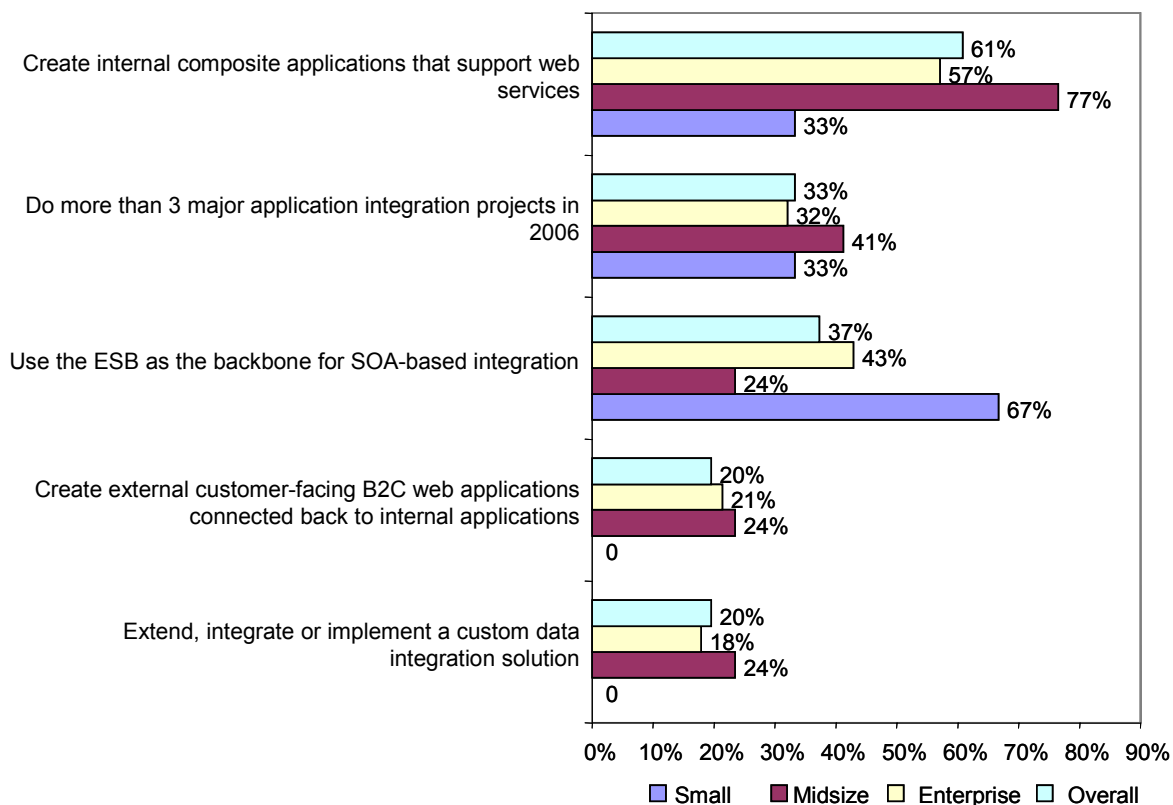
Large Companies with Revenues Exceeding \$1B

Over 40% of large companies have more than a year's experience in SOA planning, design, and programming. They are by far the most mature group. About 5/6 have already installed ESB technology, and another 10% will do so this year. Large companies are



most likely to have installed B2C, B2B, supply chain, and portal applications using SOA technology. They are interested in controlling IT costs, speeding up IT implementation, and re-using applications. Three-fifths looked at EAI along side an ESB, and a third also looked at CORBA object brokers, IBM MQ and BPM software as technology substitutes for ESBs. Ease of integration flexibility with current and planned applications is the top technical buying criteria, with overall technical attractiveness and projected ROI/ROA being the top two other buying criteria. Large companies plan to use Unix over Linux by about 3:1, with almost half using SOA as an entrée to mainframes. A third plan more than three SOA applications this year, with over half mentioning composite application development. About 40% will use outside services for initial implementations while the same will work alongside outside contractors to gain experience.

Figure 11: Challenges and Responses by Company Size



Source: AberdeenGroup, June 2006

Business Value Findings by Industry Group

Table 3 shows the business drivers of four major industrial categories. Table 4 depicts the responses to the challenges by industrial category. See Appendix A for the breakdown into the four categories.

**Table 3: Top Three Business Drivers by Industry Group (Multiple Choice)**

	Overall	Discrete/ Process	Consumer	Services	Public
Re-usage of applications via Web Services	37%	33%	27%	47%	33%
Managing IT integration costs	37%	40%	46%	35%	67%
Speed of IT implementations	31%	27%	36%	47%	0%
Alignment with the business	29%	53%	27%	12%	67%
Management of IT complexity	28%	27%	0%	29%	33%
Development of new business capabilities or new products and services	26%	20%	46%	18%	33%

Source: AberdeenGroup, June 2006

Discrete and Process Manufacturing sectors are most focused on aligning IT with the business, followed by managing IT costs. Almost half of discrete and process manufacturers will do more than three SOA application integration projects in 2006, the largest contingent of the four sectors. Discrete/process enterprises are more likely to create complex composite applications across multiple ISV application software products, making this sector ideal for an *SOA ERP* tool kit.

Consumer Goods companies are driven by IT cost management and speed of IT implementations. This sector is most likely to drive applications for new products or business services, and least likely to be challenged by IT complexity.

Services sector is equally driven by speed of IT implementations and re-use of applications via Web services, especially via composite applications. Alignment with the business is well below the overall concern. Unlike consumer companies, the typical services company is not interested in an *SOA ERP* strategy. Consumer goods manufacturers are most likely to embark on a B2C application, as web merchandising is a mature marketing approach.

Public Sector is most likely to be cost-focused and challenged by alignment of IT with the changing business requirements. The public sector is most likely overall to embrace *SOA ERP* to integrate multiple applications and least likely to create composites of internal applications. Unfortunately for backers of e-government, our small public sector sample has no interest in B2C applications.



Table 4: Top Three Responses to Challenges by Industry Group (Multiple Choice)

	Overall	Discrete/ Process	Consumer	Services	Public
Create internal composite applications that support web services	61%	47%	73%	71%	33%
Use the ESB as the backbone for SOA-based integration	37%	33%	36%	41%	33%
Do more than 3 major application integration projects in 2006	33%	47%	36%	29%	33%
Span multiple vendor's enterprise applications (i.e., ERP, CRM) as composite apps	22%	33%	9%	12%	67%
Create external customer-facing B2C web applications connected back to internal applications	20%	13%	9%	35%	0%

Source: AberdeenGroup, June 2006

Chapter Four: Recommendations for Action

Key Takeaways

- Deliberately choose the SOA path your organization should take: SOA Lite, SOA ERP or Enterprise SOA.
- ESB technology is often packaged in an ESB suite, incorporating useful features for process management and orchestration, SOA governance, security, and message adaptation across legacy applications.
- *SOA Lite* is not a long-term, best-practices approach to maximizing business value.
- Third-party SOA services are a means to boost the learning curve.

Which SOA path to choose? The widely used metaphor for SOA transition is “SOA is a journey, not a destination”. Aberdeen asks, “If you don’t know where you are you going, how will you know when you get there?” We have defined three categories of SOA environments as a result of the data derived from this study: *SOA Lite*, *Enterprise SOA*, and *SOA ERP*. We recommend that each organization categorize itself, and then optimize its tools, training, and integration planning around the best features of the chosen category, as depicted in Table 5.

Table 5: SOA Category Benefits and Disadvantages

Category	Benefits	Disadvantages
SOA Lite	Pure standards-based open source. No cost. Wide adoption. Basic skills easily attainable.	Limited support options. Few integration adapters to non-SOA software such as EAI. Not architected for mission-critical availability and very high volumes. Limited management capabilities and overall integration. No real "suite" concept today.
Enterprise SOA	Architected for mission-critical, high-volume applications. Vendor training available. Vendor support available, including 24x7. Integration into SOA suites for ESB and other SOA middleware. Many integration adapters available, lowering legacy integration costs. Best management and governance.	Highest cost of the three categories. Vendor features above industry standards causes vendor lock-in. Usual issues regarding ISV software relationships. Skills development may require training or outside services.
SOA ERP	Tightly integrated with ERP ISVs products. Best approach <i>into</i> the ERP application. Low cost add-on to latest ERP versions. Vendor training, support, and management software available at a cost.	Vendor features above industry standards causes vendor lock-in to the ERP package. Usual issues regarding ISV software relationships. Skills development may require training or outside services. Potentially limited applicability as a general purpose SOA suite.

Source: AberdeenGroup, June 2006



SOA Lite Best Suitability

Aberdeen believes that *SOA Lite* is most suitable for organizations with the characteristics:

- Small or Mid-size Companies with limited legacy application integration complexity;
- Low-to-moderate volumes and expectations for availability, such as an internal portal or Web catalog;
- Completely Microsoft, so .Net becomes a single SOA framework to learn;
- No business drivers for complex B2C or B2B applications.

Enterprise SOA Suitability

Aberdeen expects Large Companies and selected Mid-Size Companies to opt into this category based on the following characteristics:

- Extensive application integration legacy using EAI and/or mainframes;
- Complex integration where business processes routinely span multiple application software packages and in-house applications;
- Complex business processes, especially where the mix of human- and machine-based process management is changing, or the business needs are especially dynamic;
- Cross-company and outside partner integration of mission-critical applications such as supply chain and lean manufacturing;
- Service levels that demand high volumes, low response times, high availability;
- High management focus on SOA management and governance;
- Business transformation opportunities where SOA-based services open up significant business value through business process re-creation.

SOA ERP

Aberdeen expects mostly Mid-Size Companies and some Large and Small Companies to opt into this category based on the following characteristics:

- The ERP vendor is a trusted supplier to the organization, and the relationship is working;
- Business processes revolve around the ERP application software's features, and there are modest integration challenges with applications surrounding the ERP package;
- A strong desire to get more intelligence out of the ERP application without extensive custom programming due to limited skills or resources;
- Service-level expectations are in line with existing SLAs for the ERP package;



- Willingness to live with the SOA product features and development cycle of the ERP vendor;
- Business transformation outside the limits of the ERP package are modest or not expected;

Laggard Steps to Success

1. *Get on the SOA bandwagon.*

One-third of Laggards have no plans to engage in anything SOA-related. We believe this is a mistake, as even no-cost *SOA Lite* technology opens up opportunities for internal and external Web services applications, and opportunities to re-use code and applications.

2. *Upgrade installed applications to SOA versions*

Many Laggards suffer from antiquated technology and limited resources. Upgrading to the latest ISV application versions will also carry along the technology that supports the *SOA ERP* opportunities discussed above.

Industry Average Steps to Success

1. *Move from SOA Lite to SOA ERP or Enterprise SOA.*

Many Industry Average organizations are dabbling with SOA using an *SOA Lite* approach and technology set. Long-term, either *SOA ERP* or *Enterprise ERP* will bring greater return on investment as these two choices provide better integration, management and governance, and offer better support options.

2. *Pick the low-hanging fruit.*

Our numerous interviews over the past year tell Aberdeen that every organization has several business processes that are begging for an SOA new face. Not just to pretty up the user interface, but to unleash existing applications in a different form, opening up business value. Examples include putting customer self-service on the Web as a B2C application, or opening up a B2B portal for business customers.

Best in Class Next Steps

1. *Build it and they will come.*

BIC organizations are already mature in IT organization, technology selection and technology integration areas. Their opportunity is to build out an SOA infrastructure that integrates the enterprise's applications while providing an outward facing posture to customers, partners, and suppliers.



2. *Drive IT operating costs lower with SOA management and governance*

With a disciplined IT management culture, we expect the BIC to deploy SOA and ESB suites with broad SOA management features built in, and to use these features to gain early control and governance over a rapidly increasing set of services.

3. *Gather design, development, and operational metrics.*

Our survey gathered several data points that collectively indicate uncertainty at the SOA design and deployment project phases. Some, but not all, of the uncertainty is caused by lack of experience. Issues such as delays caused by an incomplete metadata repository/registry must be remedied once and for all. Production workload modeling should be conducted with your hardware supplier. Mission-critical SOA middleware testing plans must be thorough, and used best practices from the SOA software provider and any outside SOA services providers that are used.



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Peter S. Kastner,
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Area of Focus

Peter S. Kastner conducts research in the integration of information technology across and among enterprises and their customers and employees. He focuses on the near-term business value-generation tradeoffs faced by technology and business managers who must deliver repeated, short-term value gains while simultaneously refreshing the enterprise infrastructure to take advantage of evolving technology, standards, practices, and regulations. The practice covers technology integration including application development; software architectures and middleware; core architecture, processing and networking; edge devices, processing, and networking; data and business intelligence and integration; security integration; IT services; and enterprise business process and technology management.

Current Research

Kastner is delivering a research agenda centered on determining the 2006 technology tradeoffs made by business managers, the plans and experiences of enterprises with application-oriented networks, next-generation approaches to ERP integration, mid-market systems-oriented architecture (SOA) decisions, and best practices in SOA technology. Second-half research will benchmark IT outsourcing and legacy hardware and software integration, examine the numerous technologies and approaches to enterprise integration, probe buyer experiences with next-generation datacenter technologies, and research business process management and real-time operational decision-making technologies and buyer experiences with next-generation data warehouses.

Experience

Kastner's career includes a decade in systems integration, operations, and application development as a technician and manager; a decade in computer company product marketing, vertical market development, sales management, and training; and 18 years of market research experience in software and hardware technologies at Aberdeen Group. He has been cited hundreds of times in the press, has appeared on all the major U.S. news and business networks, and is a frequent speaker on issues about the business and consumer applications of technology. He is a founder of the Transaction Processing Council. In 2003, he was named one of the top five most sought after analysts by MediaMap. He sits on the Aberdeen Group board of directors.



Appendix A: Research Methodology

Between May and June 2006, **AberdeenGroup** examined the SOA middleware application, integration competency, experiences, deployments and intentions of enterprises in discrete manufacturing and process manufacturing, consumer product, service, and public sector industries.

Responding IT and LOB technology executives completed an online survey that included questions designed to determine the following:

- The maturity of SOA, ESB, and related SOA middleware use and experiences
- The technology buying criteria and the non-technical buying criteria which led to an ESB and SOA middleware buying decision
- Current and planned use of SOA technology to improve application integration and the ROI of SOA investments
- How enterprises are extracting more value using SOA middleware
- The challenges to using SOA middleware technology.

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

The study aimed to identify emerging best practices for SOA-based integration and provide a framework by which readers could assess their own SOA integration capabilities.

Responding enterprises included the following:

- **Job title/function:** The research sample included respondents with the following job titles:

Senior Management (CEO, CFO, COO)	3%
CIO/IT Leader	11%
(Senior) Vice President	24%
Director	35%
Manager	17%
Staff	7%
Internal Consultant	3%
- **Industry:** The research sample included respondents predominantly from manufacturing industries. Discrete manufacturing represented 22% of the survey, process 8%, and consumer product goods (CPG) 24%. Services industries were 37% and public sector 9%.



- **Geography:**

North America (Includes USA, Canada, Mexico)	52%
Europe	24%
Asia/Pacific	17%
Middle East, Africa	3%
South/Central America and Caribbean	4%

- **Company size:**

Less than \$50 Million	14%
\$50M to \$249M	15%
\$250M to 499M	25%
\$500M to \$999M	14%
\$1 billion to \$5 billion	15%
More than \$5 billion	17%

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Appendix B: Related Aberdeen Research & Tools

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

- [Achieving More Value From Enterprise Applications](#) (May 2006)
- [The Service-Oriented Architecture \(SOA\) in IT Benchmark Report](#) (December 2005)
- [The Service-Oriented Architecture in the Supply Chain Benchmark Report](#) (September 2005)
- [Enterprise Service Bus: the Foundation of Service-Oriented Architecture](#)
- [The Strategic Enterprise IT Budget Realities](#)
- [The 2005 CIO Agenda — CIO Disruptors](#)
- [The IT Spend Benchmark Report](#)
- [SOA Success Starts with IT Success](#)
- [The ESB in the Land of SOA](#)
- [“Supply Chain as a Service”: The Next Big Thing?](#)
- [Creating Composite Business Process Applications for Enterprise Integration](#)
- [Enterprise Applications: Build or Buy?](#)
- Sector-Based Research
 - [For Mid-Size Enterprises, SOA’s Benefits Begin with IT](#)
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 - [SOA is Made to Order for Mid-Size Manufacturers](#)
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- **LEVERAGE** information technology for tangible business value.

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- **ACCELERATE SALES**, by accessing executive decision-makers who need a solution and arming the sales team with fact-based differentiation around business impact
- **EXPAND CUSTOMERS**, by fortifying their value proposition with independent fact-based research and demonstrating installed base proof points

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