



Aberdeen *Group*

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# The Composite Applications Benchmark Report

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*How SOA Standards Are Accelerating Business Change*

December 2006



## Executive Summary

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**A**pplication integration is a major IT headache and takes up about 40% of the typical IT budget, according to recent Aberdeen research. A typical enterprise's business processes are found in multiple IT applications, and the service-oriented architecture (SOA), which can encompass web services as well as the integration, business logic, and legacy technologies behind it, is seen as the technological means to solving the application integration problem.

However, that research has found that most organizations have not dived deep enough into SOA to have one fully implemented. So, they have turned to building **composite applications** as fast as they can to deliver more value to line-of-business units, which always takes higher priority over IT's ability to deliver changes.

Composite applications contain logic and data collected from multiple IT sources and harnessed with Web services standards such as XML, SOAP, and WS-\*. These applications are rapidly becoming the development standard of choice in all IT organizations. However, our research has found that **composite applications can be built and implemented with Web services and SOA standards even if the organization has yet to fully develop an SOA**. This allows IT to respond to the pressure of **delivering more value to the business** while **helping ease the pains of technological integration**.

### Key Business Value Findings

Here are three key findings from our research for this report:

- Best in Class firms realize the inadequacy of their present development tools and are actively investing in new composite development technology.
- An IT organization that wants to accelerate the delivery of more composite applications must invest in more targeted training or use outside IT services.
- Companies looking to build more composite applications should look first to the web. Browser-based and portal applications are the most common first deliverables.

### Implications & Analysis

The research results also yielded these insights:

Composite applications are delivering on IT business drivers of faster implementation, business process transformation agility, and lower integration complexity and risk. But composite application-building is not trivial. As one IT director told us, "Be prepared for integration to be *more* complex for IT, even if it simplifies it for the business."

IT shops with Java and Windows .Net can achieve the best ROI and lowest life-cycle application maintenance costs with cross-platform composite development tools.

- A common failure is charging ahead in spite of inadequate planning and training.



## Recommendations for Action

Here are our chief recommendations for all organizations interested in developing and delivering composite applications:

- **Proper planning is a critical first step.** While modest composite applications can be built in skunkworks projects, serious composites involving legacy applications and databases require careful consideration. About 15% of survey respondents left a lesson learned comment about how they underestimated or short-changed rigorous, staged project and technology planning.
- **Start small and grow with experience and confidence.** Only a small percentage of survey respondents are confident that they can rapidly grasp the considerable integration challenges across multiple projects.
- **Invest in targeted training.** Plan training around composite infrastructure layers such as user interface, message transport, and legacy application wrapping so specialists can ramp up experience and deliver quick return on value. Match the training activities or outside IT services carefully with the needed staff skills.
- **Bring in professional service partners to assist.** One lesson learned from survey respondents: “Climbing the composite application technology mountain without an IT services guide is risky if not foolhardy,” a medical products executive says. And an insurance company executive chimed in that “service provider experienced personnel are worth their weight in gold, while the inexperienced are millstones”
- **Invest in the development tools needed for the long term.** The design, software development, testing, quality assurance, and deployment technology and methods that worked with earlier application development methodologies are not optimized for building composite applications. **Look to Best in Class companies, 65% of which are buying new composite application-related technology within the next six months.** But one chastened financial services executive offered this sage advice regarding extensive tool functionality: “Don’t negate the automated code-generating capabilities of many modern tools by modifying the generated programs. It creates a maintenance nightmare.”

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## Chapter One: Issue at Hand

### Key Takeaways

- Enterprises are trying to develop and deploy applications that deliver value to the business while dealing with the costs and headaches that come with IT integration.
- Although composite applications are believed to go hand-in-hand with a service-oriented architecture, many IT groups are building them first with web services to respond to the delivery pressures from the business units.
- The chief technological goal of composite applications is to help simplify the IT infrastructure and allow for quicker and easier platform consolidation.

Recent Aberdeen research has shown that application development and integration is a major IT headache, costing around 40% of the typical IT budget in a \$1.3 trillion global IT economy. A typical enterprise's business processes are found in multiple IT applications, and the service-oriented architecture (SOA), which includes web services, is seen as the technological means to solving the application integration problem.

However, that research – of more than 2,000 companies over the past year – has found that most organizations have not waded deep enough into the SOA “pool” to have a full SOA in place. So, they have turned to building composite applications as fast as they can to deliver more value to the line-of-business, which always takes higher priority over IT's ability to deliver changes.

### What Are Composite Applications?

Composite applications contain logic and data collected from multiple IT sources and harnessed with web services standards such as XML, SOAP, and WS-\*. These applications are rapidly becoming the development standard of choice in all IT organizations.

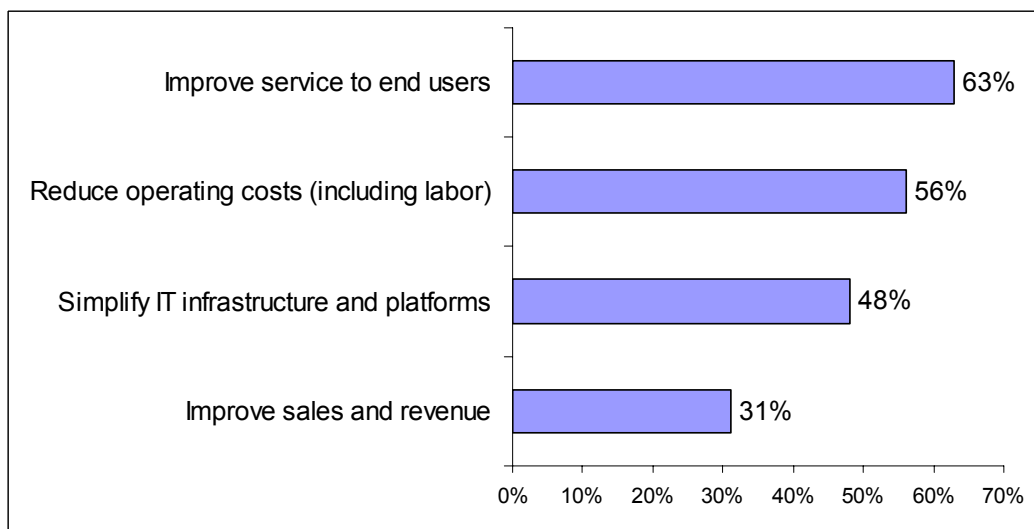
Wikipedia defines a composite application as one “built by combining multiple services” consisting of “functionality drawn from several different sources within” an SOA to functionality, we would add data, since information management is critical to all enterprise applications. But our research yields a more practical conclusion: **Composite applications can be built and implemented even if the organization has yet to fully develop an SOA.**

Why? To respond to the pressure of **delivering more value to the business while helping ease the pains of technological integration.**

The research conducted for this report has borne out our definition. The top business driver, or pressure, pushing composite applications to the front of the development priority line is *improving service to end users* (Figure 1). And the chief technology outcomes organizations are seeking? Simpler integration with the technology infrastructure and a key to easier and faster platform consolidation (Figure 2).

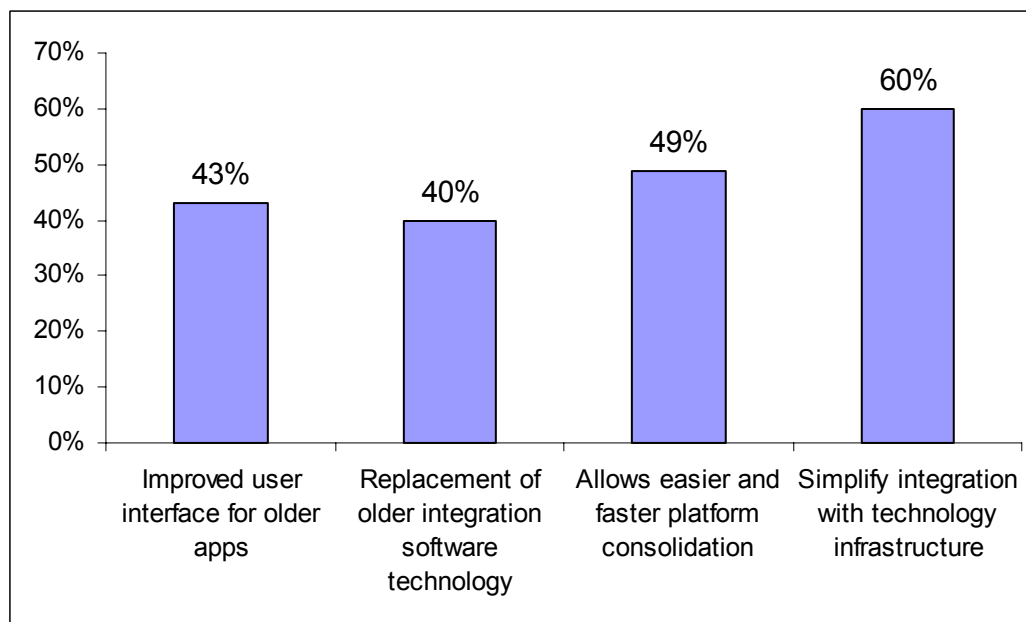


**Figure 1: Business Drivers for Building Composite Applications as Top Priority**



Source: Aberdeen Group, November 2006

**Figure 2: Desired Technology Outcomes from Composite Applications**



Source: Aberdeen Group, November 2006

Our hypothesis for this report was that the IT norm for creating composite applications is creating “an application built by combining functionality and data drawn from several different sources, using web services within a SOA.” In other words, SOA standards such as XML, SOAP, and WS-\* are allowing much more cost- and time-effective application integration than older approaches do, with better user interfaces, so that the ultimate goal

of a full-blown SOA in which all applications are parts of services, is, rather, a secondary goal.

Our survey for this report proved the hypothesis correct. Only 31% of respondents identified ***building out their services architecture plans*** as a key technology outcome their companies sought from building composite applications.

So, our first question to the Global 5000 for this report is: How do composite applications, created with web services, fit into an overall services-oriented architecture, and when will these composites be integrated into the long-term SOA for the organization?

Our next questions focus on how enterprises are choosing their approaches, and what factors, drivers, and challenges distinguish successful organizations from the not so successful. In the next two chapters, we'll offer the answers and elaborate on them. We will also

Competitive Framework Key
<p>The Aberdeen Competitive Framework defines enterprises as falling into one of the three following levels of practices and performance:</p> <p><i>Best in Class (20%) —practices that are the best currently being employed and significantly superior to the industry norm</i></p> <p><i>Industry Average (50%) —practices that represent the average or norm</i></p> <p><i>Laggards (30%) —practices that are significantly behind the average of the industry</i></p>

detail how leading, that is, Best in Class, companies are facing the issue of building composite applications, and how their approaches lead them to perform better than Industry Average and Laggard companies within Aberdeen's Competitive Framework.



## Chapter Two: Key Business Value Findings

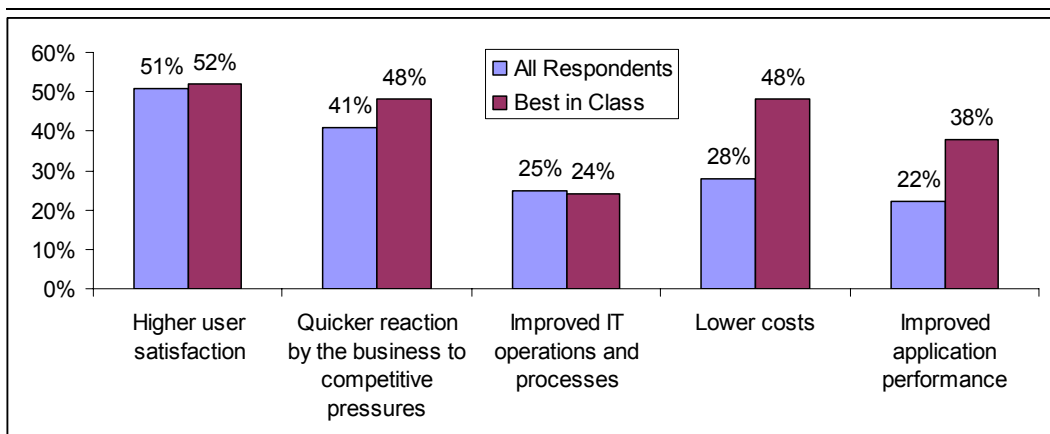
### Key Takeaways

- Best in Class firms realize the inadequacy of their present development tools and are actively investing in new composite development technology.
- An IT organization that wants to accelerate the delivery of more composite applications needs to invest in more targeted training or use outside IT services.
- Companies looking to build more composite applications should look to the web first. Browser-based and portal applications dominate work that has been done so far.

Aberdeen estimates that the average Global 1000 enterprise has produced 1.5 billion lines of program code over the past 30 years at a 2006 replacement cost of \$75 billion. The business focus for *any* organization should be on optimizing the processes that make it unique, such as customer satisfaction, service delivery, low-cost supply, and fast delivery. Most enterprises are doing this by decomposing business processes into services under the guise of SOA technology, which is proving to lower life-cycle costs while improving agility.

Aberdeen's executive-level readers tell us that, working with an SOA mindset, teams of business users and IT technicians can readily identify the business process inefficiencies that will deliver a fast or large payback. According to the survey results for this report, IT practitioners are finding they can keep up with line-of-business agility and change requirements better by moving to an SOA-based approach using composite applications. In Figure 3, note that higher user satisfaction and quicker business reaction rate considerably higher than improving IT or merely lowering costs.

**Figure 3: Benefits from Developing and Deploying Composite Applications**



Source: Aberdeen Group, November 2006

Best in Class organizations scored higher than the average in most of these five categories, which demonstrates that while they recognize the impact composite applications can have on the business, they're also much more adept at lowering costs while simultane-

ously achieving other goals. Also note that Best in Class organizations have governance processes in place to focus on line-of-business user satisfaction.

Table 1 shows the distinctions between the Best in Class, Industry Average, and Laggard organizations in this survey.

**Table 1: Competitive Framework for Building Composite Applications**

	Best in Class	Industry Average	Laggards
<b>Process</b>	Overwhelming emphasis on application's importance to the business in prioritizing composite application development; strong emphasis on planned ROI	Strong emphasis on application's importance to the business in prioritizing composite application development; weaker but still strong emphasis on planned ROI	Strong emphasis on application's importance to the business in prioritizing composite application development; half place strong emphasis on planned ROI
<b>Organization</b>	Most designate either supply chain/B2B or customer service/e-commerce apps as first priority for building composite applications	Don't have top priority for development, though strong minorities favor customer service/e-commerce and supply chain/B2B applications	Don't have top priority for development, though strong minorities favor customer service/e-commerce and supply chain/B2B applications
<b>Knowledge</b>	Most are trained, experienced, and confident in project-level budget and schedule estimates based on experience gained on multiple composite projects	Most have multiple-project experience but lack confidence or sufficient training, or miss budgets and schedules	Little to no experience and confidence to build serious composite applications and/or routinely meet budgets and schedules
<b>Technology</b>	<b>MIDDLEWARE:</b> Most use Enterprise Service Bus; many, but not most, use SOA security, governance, and management products <b>APPS DELIVERED:</b> Nearly all have delivered portal and browser-based applications	<b>MIDDLEWARE:</b> Most use Enterprise Service Bus; many, but not most, use SOA security, and repository/registry <b>APPS DELIVERED:</b> Most have delivered portal and browser-based applications	<b>MIDDLEWARE:</b> Most use Enterprise Service Bus, but close to one-third are not planning to have any SOA middleware <b>APPS DELIVERED:</b> Most have delivered portal and browser-based applications

Source: Aberdeen Group, November 2006

### Determining the Best in Class

For this report, Aberdeen determined its Best in Class organizations as the best 20% of the survey population with the following quantitative and qualitative characteristics:

- **TIME.** They can build a typical composite application in three months or less (Industry Average: 3 to 9 months; Laggards: more than 9 months);



- **NUMBER OF APPLICATIONS.** They have delivered more than 11 composite applications (Industry Average: 3 to 10; Laggards: Two or fewer);
- **ROI.** They have achieved greater than 25% ROI by building composite applications (Industry Average: 11-25; Laggards: 10% or less).
- **EXPERIENCE.** Their IT organizations have more training, experience, and confidence in project-level budget and schedule estimates based on multiple composite projects.

### The Value of Experience and Using the Right Tools

Nearly three-quarters of respondents from Best in Class organizations (71%) have the best possible experience level in building composite applications, compared with just 21% of the entire survey pool (Table 2). This is not surprising given that most organizations are still learning about composite applications. In fact, most of those who selected this answer cited these three key growing pains in becoming more adept at composite applications:

- **Only key staffers are able to lead composite projects.** This highlights a need for more training to enable more of the programming staff to complete projects.
- **Composite technology and investments could be improved,** which points to the relative immaturity of tools IT programmers use today to aid in building and developing composite applications, or the lack of investment in composite technology. However, Best in Class organizations are a step ahead here: Nearly two-thirds (65%) of the Best in Class plan to buy new composite application-building technology in the next six months, versus only 25% of other responding companies.
- **Difficulty in testing and deployment stages of development,** which implies *process* immaturity. It also points to the unavoidable complexity that can lurk behind glitzy web screens, causing unforeseen testing and performance issues.

**Table 2: Organization Confidence in Building Composite Applications**

Statement	% Who Answered
Some experience but lack experience and confidence to routinely meet budgets and schedules	22%
<b>Trained, experienced, and confident in project-level budget and schedule estimates based on multiple composite projects</b>	<b>21%</b>
Multiple project experience but miss budgets and schedules	16%
Could use more training	16%
Lack experience and confidence to build serious composite applications	15%
Multiple project experience but lack confidence	10%

Source: Aberdeen Group, November 2006



## The Tools to Get the Job Done

Before starting to build enterprise applications, wise enterprises are rebuilding their development methodologies — and often their development organizations. At 15 million lines of code per average enterprise application, thousands of applications per enterprise, and programmer productivity around 10 lines of debugged code per man-day with the third-generation tools (e.g., C++) most organizations are using, simple arithmetic says we will not, in our lifetimes, rewrite the existing applications with today's approaches. Even offshoring the work will cost billions and result in huge test and deployment costs. It's not feasible unless the development technology changes.

While early progress can be made with a variety of SOA developer tools and infrastructure middleware, the long-term development environment will involve these five planned investments in technology and people skills: *Web browser information delivery*, *business process modeling*, *legacy application modernization*, *data migration and information as a service*, and *SOA middleware: tying composite applications into an enterprise SOA infrastructure*.

Not investing in these five technologies will reduce the opportunity-payback curve significantly over the next decade. Here are some key survey results for two of those technologies.

### **Web Browser Information Delivery**

Looking back a decade, the industry has come a long way from hand-coded HTML. The browser is now the common denominator for delivering application functionality, and most companies represented in the Aberdeen survey are already building and delivering composite browser-based and portal applications, much more so than non browser-based applications (Figure 4).

Portal technology enhances the “have it your way” user experience. For web application developer productivity as well as user experience satisfaction, modern browser-based application tools are essential.

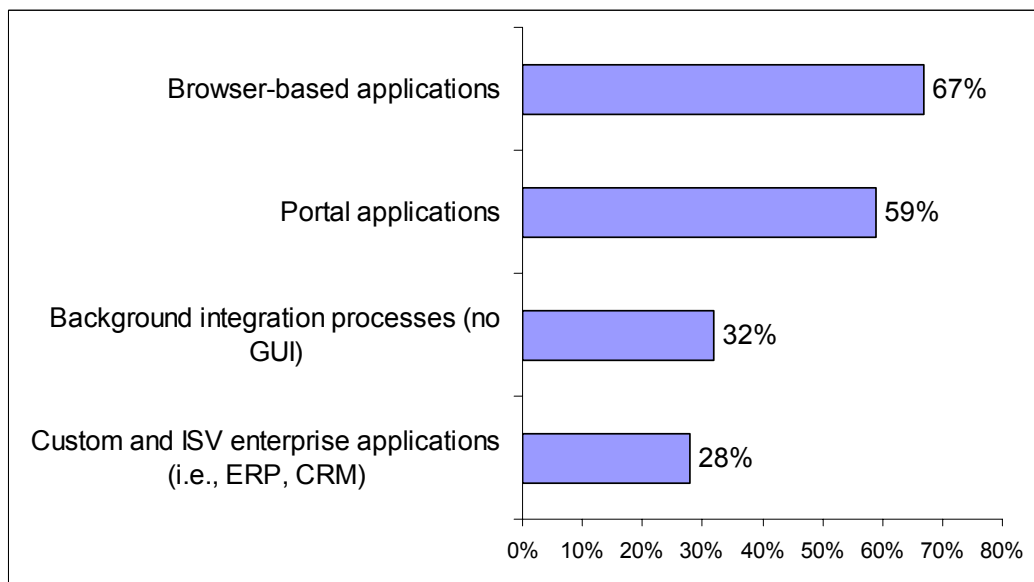
### **Business Process Modeling**

One of the biggest reasons for high enterprise integration costs over time is the fact that the logic and rules for business processes are locked inside the source program code itself. Changes require an analyst to document the process change, a programmer to change the program, and a QA team to test that the changes did what the analyst wanted and didn't induce errors. With BPM, users and analysts can model the rules, data flow, human and system interactions that make up a business process, often without a change-order to IT. Life-cycle costs and cycle times are dramatically reduced because changing the process means changing the model with a graphical tool.

Moving frequently changed business rules and parameters out to line-of-business control under a BPM is an important step in unlocking long-term value while enhancing IT agility.



**Figure 4: Percentage of Companies That Have Delivered Specific Composite Applications**



Source: Aberdeen Group, November 2006

### ***Legacy Application Modernization***

Our recent study on [Legacy Application Modernization](#) shows the majority of IT practitioners are extending and surrounding enterprise applications with SOA middleware, preferring to leave those applications largely intact while incorporating the SOA glue that allows those applications to become part of a composite application or service. However, many companies are using the SOA “technology changeover” to modernize the application itself using automated technology to extract the logic and data for migration to a new software technology base.

### ***Data Migration and Information as a Service***

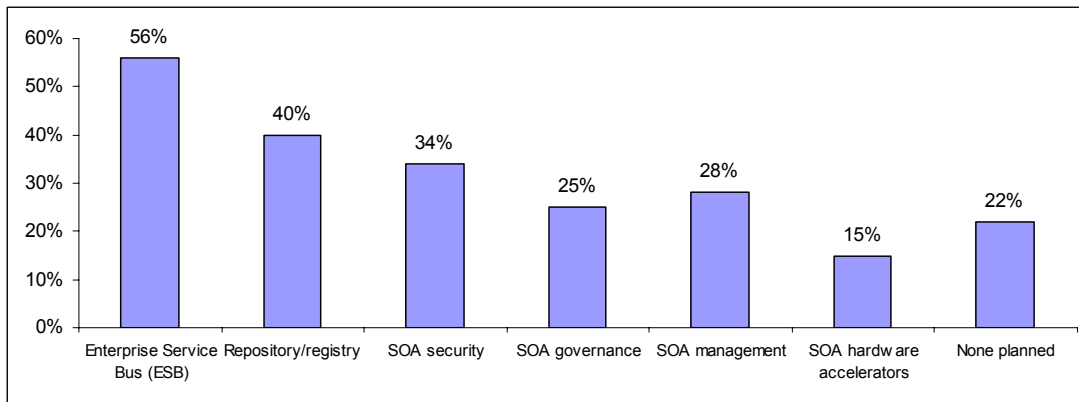
Aberdeen research consistently shows data migration as a challenge that IT practitioners underestimate. The SOA application makeover creates the opportunity to move off older databases and consolidate databases around SOA services. Simply put, enterprise data also needs to be extracted from applications and databases and presented to SOA services as the reliable data of record. Master data management and other computer science concepts are reducing duplicative data and making it more widely available for analysis and computing. In short, data migration technology has many advantages over the traditional, in-house data conversion and migration project-task approach.

### ***SOA Middleware***

Aberdeen’s prior SOA research indicated that the market recognizes SOA infrastructure middleware as a necessary and early investment. Companies represented in this study recognize that too. However, as in our prior research, we found there are three distinct approaches to SOA. One group embraces Web services but not SOA middleware. A second group (Figure 5) is building out an SOA infrastructure with middleware products,

while the third group is using ERP vendors' SOA middleware. We discuss these three approaches further in Chapter 3.

**Figure 5: SOA Middleware Products That Companies Have or Are Planning**



Source: Aberdeen Group, November 2006

Best in Class enterprises identified in previous studies are installing certain suites of SOA capabilities that are mandatory in the long run but can be skipped on a single project: registry/repository, enterprise service bus, security, management, and governance. Given that the objective is to reduce the 40% of IT budget spent on integration, we are confident that the early investments in entire suites of SOA management and operational capabilities will be recovered quickly, and at the lowest life-cycle costs.

A majority of organizations interested in integrating their composite applications immediately into SOA middleware suites are using Java-based development toolsets such as the Eclipse interactive development environment (IDE), third-party Java tools, and cross-platform development tools that generate Java and Windows code.

Orchestrating the pieces of composite applications into manageable services that pass IT governance muster requires enterprise-class middleware that supports SOA standards and becomes the organization's long-term infrastructure.



## Chapter Three: Implications & Analysis

**Key Takeaways**

- Composite applications are delivering on IT business drivers of faster implementations, business process transformation agility, and lower integration complexity and risk.
- IT shops with Java and Windows .Net can achieve the best ROI and lowest life-cycle application maintenance costs with cross-platform composite development tools.
- A common failure is charging ahead with inadequate planning and training.

In Chapter One, we addressed the business reasons that make composite applications an IT priority. We also asked respondents to identify the IT *business* drivers and found a strong correlation between the two groups (Table 3). This signals a high level of business-IT alignment on the key issues affecting the business that would lead to the development of composite applications.

**Table 3: Top Business and IT Drivers for Composite Applications**

Business Reasons	% Selected	IT Business Drivers	% Selected
Improve service to end users	63%	Need for faster implementations (i.e., time to delivery)	52%
Reduce operating costs (including labor)	56%	Business process transformation	52%
Simplify IT infrastructure/platforms	48%	Lower integration complexity and risk	43%
Improve sales and revenue	31%	Simplify IT software infrastructure and/or applications	34%

Source: Aberdeen Group, November 2006

The predominant strategies, or actions, along with the internal capabilities (process competencies) and technological enablers, are detailed in Table 4 as part of Aberdeen’s PACE framework (See PACE Key). Just as encouraging as the alignment on drivers is organizations’ emphasis on strategic actions; **80%** prioritize development on applications’ importance to

**PACE Key — For more detailed description, see Appendix A**

*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:*

**Pressures** — external forces that impact an organization’s market position, competitiveness, or business operations

**Actions** — the strategic approaches an organization takes in response to industry pressures

**Capabilities** — the business process competencies required to execute corporate strategy

**Enablers** — the key functionality of technology solutions required to support the organization’s enabling business practices

the business. This came in far ahead of the second most popular strategic action, prioritizing based on planned ROI (59%).

**Table 4: PACE (Pressures, Actions, Capabilities, Enablers)**

Prioritized Pressures	Prioritized Actions	Prioritized Capabilities	Prioritized Enablers
<b>Improve service to end users</b>	Prioritize applications to be developed by their importance to the business ( <i>cited by 80% of survey respondents</i> )	Adequate training and experience to meet project milestones; use of outside IT services to help programming teams	Enterprise Service Bus and SOA middleware Third-party development tools that generate Java code
<b>Reduce operating costs (including labor)</b>	Prioritize applications to be developed by their planned ROI; measure programmer productivity	Adequate training and experience to meet project budget milestones; out-source some composite development	Repository/registry middleware Third-party application development tools that generate Java and Windows code from a single program source
<b>Simplify IT infrastructure/platforms</b>	Prioritize applications to be developed through a risk/reward evaluation; consider development tool and platform consolidation	Adequate training and experience to meet project milestones; use of IT services to help design teams or assist in data migrations, conversions, or SOA installations	SOA security middleware Eclipse IDE and third-party Eclipse plug-ins
<b>Improve sales and revenue</b>	Prioritize applications to be developed according to <i>most</i> amount of effort required; consider how web services can improve customer satisfaction levels	Adequate training and experience to meet project milestones; use of IT services to help in needed areas, such as design, programming, training, or project management	SOA governance middleware Third-party development tools that generate Windows code
<b>Competitive pressures</b> ( <i>cited by 24% of respondents</i> )	Prioritize applications to be developed according to <i>least</i> amount of effort required	Adequate training, experience, and confidence to meet tight project deadlines; use of IT services to help in areas to facilitate development and installation	SOA management middleware Traditional 3GL development tools

Source: Aberdeen Group, November 2006

This supports a key finding from our recent *Legacy Application Modernization Benchmark Report*, in which we found that **Best in Class organizations had strong enterprise-wide buy-in for SOA**. The upshot here is that composite application development, since it's linked with SOA, requires an organization-wide commitment, especially because of the extent of its impact.



While the IT organization must clearly communicate the changes an SOA or composite application will bring and the value it can deliver, the line-of-business units must be fully aware of how it can work for the benefit of the entire business, especially in how it can facilitate the flow of information between services, or facilitate workflow.

### Challenges and Responses

The top challenges respondents said their companies experience are linked tightly to the immaturity of the market for composite application development tools and the need for more expertise (Table 5). There is little wonder, then, that each of the top five responses to the challenges can be linked to those technological and skills challenges.

**Table 5: Composite Application Development Challenges and Responses**

Challenges	% Selected	Responses to Challenges	% Selected
Required more technical education or support than planned	58%	Learned by experience; challenges were not severe	46%
Composite application development tools	53%	Contracted for outside IT services or outsourced the project	40%
Missed schedules	38%	Expanded training and/or raised qualifications of staff	38%
Over budget	30%	Bought new composite application-building technology	34%
Standards-based code did not work as planned	28%	Slowed our SOA implementation efforts until challenges overcome	28%

Source: Aberdeen Group, November 2006

Our research shows enterprises are not building alone. **More than three-quarters — 76% — are engaging outside services**, with most either outsourcing some composite development work or assisting the programming teams. This dovetails with previous research on SOA and application development, in which Aberdeen found that enterprises are engaging outside services to install and tune the SOA infrastructure, look at the transformation opportunities SOA technology can enable, and transfer skills by working alongside internal IT teams.

Outsourcing development work can also be a shrewd use of cash. In our recent benchmark report, *Outsourcing Application Development and Maintenance*, we found that Best in Class organizations are achieving better than a 50% ROI in outsourced application development and maintenance (However, outsourcing carries a different set of challenges and key performance measures, and requires special management skills that many firms admittedly lack, according to Aberdeen research findings).

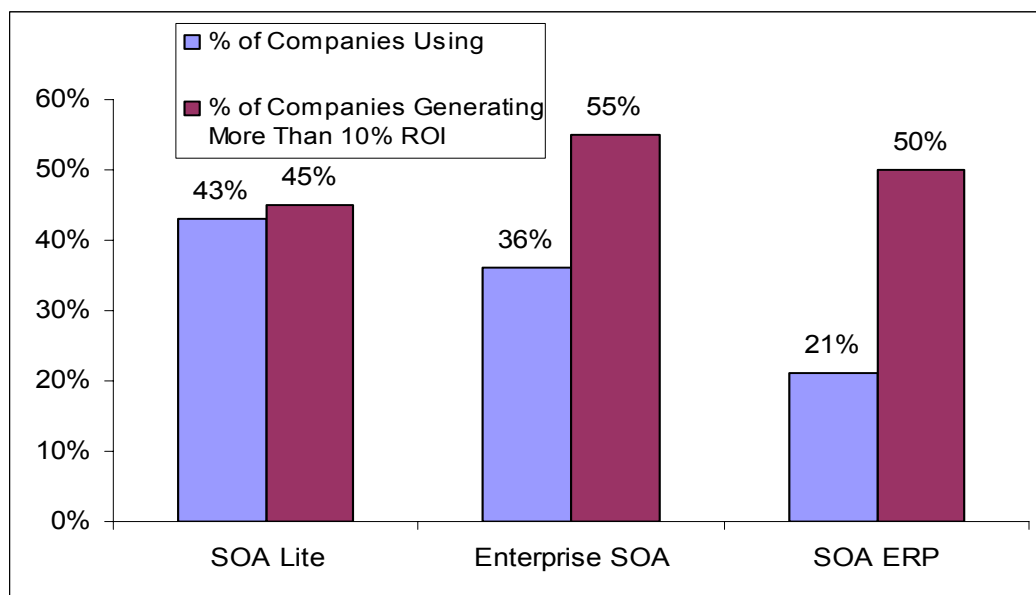
## Approaches to SOA

Earlier this year, an Aberdeen benchmark report, *Enterprise Service Bus: An SOA Middleware Foundation*, found users split into three technology camps in adopting SOAs:

- **SOA Lite**, which is for users that 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**, which is used by companies that are choosing to deploy SOA surrounding their ERP application software; and
- **Enterprise SOA**, which requires and uses mission-critical SOA middleware capabilities.

This benchmark found that most organizations opt for SOA Lite or Enterprise SOA. But half of those taking the SOA ERP route are generating more than 10% ROI from their composite application implementations, while 55% of Enterprise SOA organizations are getting double-digit payback (Figure 6). While SOA Lite remains the most popular approach (with the least effort), less than half the companies in the survey that are using SOA Lite are returning more than 10% on their investments. This finding indicates that there is a higher return for organizations that take the two more involved approaches.

**Figure 6: Approaches to SOA and ROI Generated from Composite Applications**



Source: Aberdeen Group, November 2006

Not surprisingly, 71% of companies using SOA ERP are manufacturers, which are more likely to use ERP software to help run their businesses.

## The Landscape by Company Size

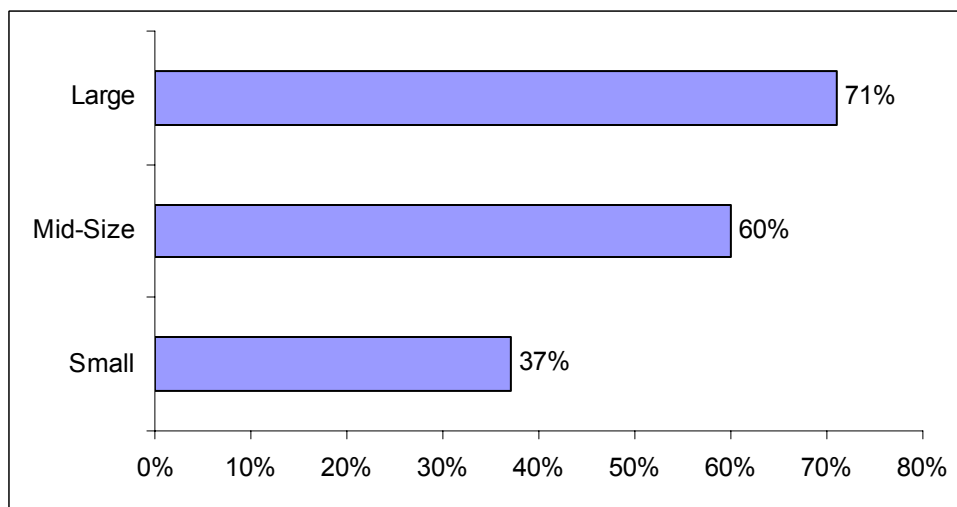
The survey's response pool was close to evenly distributed by company size, but the story lines between the three groups (large company: at least \$1 billion in annual reve-



nue; mid-size: \$50 million to \$1 billion; small: up to \$50 million) reveal some interesting differences. For instance:

- Half of large companies take the Enterprise SOA approach while 53% of small organizations prefer SOA Lite, which is not a surprise given the resource constraints that are endemic among small companies.
- Nearly two-thirds (64%) of large companies cite a **need for faster implementations** as a key IT business driver in building composite applications, compared with 45% of mid-size enterprises and 47% of small organizations.
- While only 32% of companies are building composite applications to **extend the life of their legacy applications and assets**, 48% of mid-market companies cited this, an indication that most are reluctant to invest more than they have to in upgrading their infrastructures.
- Most large and mid-size organizations have implemented or are planning to install **enterprise service bus (ESB)** middleware (Figure 7).

**Figure 7: Organizations Investing in Enterprise Service Bus (ESB) Middleware**



Source: Aberdeen Group, November 2006

## Chapter Four: Recommendations for Action

### Key Takeaways

- To become even better, Best in Class organizations must build the experience level of their IT staff through training and via the expertise of services partners.
- Industry Average firms should focus much of their development on one or two critical business processes to help maximize ROI while boosting development expertise.
- Laggards need to focus most heavily on IT training, and place a stronger emphasis on increasing user satisfaction and business success.

Composite applications are helping companies fill pressing IT needs while they inch toward fulfilling their entire SOA strategies. Certainly, responding to competitive pressures in a global business climate fueled by information requires quick decision-making that can be hampered by a lack of adequate, state-of-the-art technology. Indeed, Best in Class organizations recognize this, which is why they are more likely to target composite application development at supply chain and customer-facing functions.

This report has highlighted the keys to success for composite application development, as well as the factors that hinder success. Our research has borne out these factors that are critical to improved composite application development and delivery:

- **Proper planning is a critical first step.** While modest composite applications can be built in skunkworks projects, serious composites involving legacy applications and databases require careful consideration.
- **Start small and grow with experience and confidence.** Only a small percentage of survey respondents are confident that they can rapidly grasp the considerable integration challenges across multiple projects. And they are challenged with too few trained staff.
- **Invest in targeted training.** Plan training around composite infrastructure layers such as user interface, message transport, and legacy application wrapping so that specialists can ramp up experience and deliver quick return on value. This training strategy implies matching the training activities and/or outside IT services carefully with the needed staff skills.
- **Bring in professional service partners to assist in the effort.** One lesson learned from survey respondents is: “Climbing the composite application technology mountain without an IT services guide is risky if not foolhardy,” as one medical products executive told us.
- **Invest in the development tools needed for the long term.** One key finding is that the design, software development, testing, quality assurance, and deployment technology and methods that worked with earlier application development methodologies are not optimized for composite application development. Look to the



Best in Class companies, 65% of which are buying new composite application-related technology *within the next six months*.

Here are our recommendations for companies in any of the three groups of the Aberdeen Competitive Framework for building composite applications.

### **Best in Class Next Steps**

- 1) *Build the experience level of IT staff.*

Maintain or increase investment in IT developer training and encourage project “post mortems” to document lessons learned that can benefit operations for future development projects. Use these lessons to help develop and modify a “project playbook.” As outlined above, implement a technology role-based training program.

- 2) *Keep the focus on the application’s importance to the business.*

The Best in Class adhere to this more than the Industry Average and Laggard organizations. Since they’re twice as likely to recognize competitive pressures as a driver for composite applications, they need to maintain or increase their knowledge of the issues affecting their companies’ market positions. More experience and training for developers can only enhance their ability to deliver within a tight timeframe. Also, each composite project should add to the build-out of the organization’s SOA strategy.

- 3) *Professional services partners can help.*

Best in Class organizations were the least likely of the three Competitive Framework groups to bring in outside help to enhance internal composite application development skills. But if a services partner can do some of the work while allowing IT staff to learn from them, that lessens the chance that you’ll need to keep bringing them back for subsequent projects, which will boost project ROI. This is especially important in small and mid-sized companies with limited depth of Web services and SOA specialist skills.

### **Industry Average Steps to Success**

- 1) *Build the skills of the IT staff to shorten time to deployment.*

Industry Average companies take, on average, about twice as long as the Best in Class to complete a composite application project. Building experience through organizational orientation toward composite-building specialists, increased training, or small projects can help improve project delivery and allow IT to take on bigger and more critical projects.

- 2) *Target specific business processes rather than take a “random” approach.*

Unlike Best in Class firms represented in the Aberdeen survey, Industry Average and Laggard companies are more likely to develop composite applications for many business processes. To build success, focus on one or two process areas that can provide the biggest boost for end-to-end process improvement within a process area. By building out a business area in quick succession, staff re-



familiarization will be lower and code re-use will be higher, lowering project and overall costs.

3) *Look to IT service providers for help.*

Most Industry Average organizations rely on professional service partners to supplement the IT staff in such critical development functions as design, programming, legacy modernization, and data migration. Lean toward a service provider that can help boost the skill level of your IT staff.

## Laggard Steps to Success

1) *Invest in targeted IT training.*

Only 16% of Laggard companies say they have multiple project experience. This is a red flag for their IT groups as well as the rest of these organizations. Laggards would be best off engaging in small projects that can gradually lift the experience and confidence levels of their development groups. Interesting statistics from the survey: 65% of Laggards said implementing composite applications required more technical education or support than they had planned.

2) *Keep the focus on SOA.*

Alarming, 39% of Laggard organizations said challenges in their composite application work slowed their SOA implementation efforts. But higher percentages said they learned from experience and brought in IT services providers to assist in their efforts. Up-skilling the IT staff can help keep both composite application projects and SOA strategies on track. Taking your eye off the SOA ball can only further delay reaping the benefits SOA can bring.

3) *Place business success and end-user happiness at the top of the priority list.*

Most Best in Class and Industry Average companies cited higher user satisfaction and quicker enterprise reaction to competitive pressures as benefits from composite application development. Laggards need to maintain that focus if they are to boost their competitiveness. Happiness is not just “warm fuzzies.” One interviewee told us that composite application development projects drove considerably higher end-user productivity, especially by re-working screens and transaction workflow for repetitive tasks.

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## Appendix A: Research Methodology

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**F**rom October to December 2006, Aberdeen Group examined the services parts management procedures, experiences, and intentions of nearly 135 enterprises in the a variety of industries, most from the manufacturing and services sectors.

Responding executives, directors, and managers completed an online survey that included questions designed to determine the following:

- Organization experience with developing composite applications;
- The business and IT factors driving composite application development; and
- The key performance indicators (KPIs) that separated leading, or Best in Class, companies from others in composite application development.

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

The study aimed to identify emerging best practices for developing and delivering composite applications and provide a framework by which readers could assess their own composite application development capabilities.

Responding enterprises included the following:

- **Job title/function:** The research sample included respondents with the following job titles or functions: manager (28%); senior management, such as CEO, CFO or COO (14%); director (17%); consultant (14%); vice president (7); CIO (4%); and staff and other (16%).
- **Industry:** The research sample included respondents predominantly from manufacturing industries. High technology and software manufacturers represented 19% of the sample, followed by finance/banking/accounting (9%); public sector organizations (9%); transportation/logistics (8%); computer equipment and peripherals (6%); insurance, real estate and legal services (5%); industrial equipment manufacturing (4%); and retail(4%). Other sectors responding included aerospace/defense, apparel, automotive, chemicals, construction/architecture/engineering, consumer durable goods, consumer packaged goods, distribution, education, food/beverage, health/medical/dental services, medical devices, metal and metal products, mining/oil/gas, pharmaceutical manufacturing, publishing/media, telecommunications services, travel/hospitality/restaurant, utilities, and wholesale.
- **Geography:** Forty-three percent of study respondents were from North America. Remaining respondents were from Europe (28%), Asia Pacific (23%), Middle East/Africa (3%), and South/Central America and the Caribbean (3%).
- **Company size:** About 34% of respondents were from large enterprises (annual revenues above US\$1 billion); 32% were from midsize enterprises (annual revenues be-

tween \$50 million and \$1 billion); and 34% of respondents were from small businesses (annual revenues of \$50 million or less).

Solution providers recognized as sponsors of this report were solicited after the fact and had no substantive influence on the direction of *The Composite Applications Benchmark Report*. Their sponsorship has made it possible for Aberdeen Group to make these findings available to readers at no charge.

**Table 6: PACE Framework**

PACE Key
<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><i>Pressures</i> — 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><i>Actions</i> — 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><i>Capabilities</i> — the business process competencies required to execute corporate strategy (e.g., skilled people, brand, market positioning, viable products/services, ecosystem partners, financing)</p> <p><i>Enablers</i> — 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, November 2006

**Table 7: Relationship between PACE and Competitive Framework**

PACE and Competitive Framework How They Interact
<p>Aberdeen research indicates that companies that identify the most impactful 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.</p>

Source: Aberdeen Group, November 2006

## *Appendix B:* **Related Aberdeen Research & Tools**

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

- [\*The Legacy Application Modernization Benchmark Report\*](#) (September 2006)
- [\*Outsourcing Application Development and Maintenance Benchmark Report\*](#) (October 2006)
- [\*The Business Process Management Benchmark Report\*](#) (August 2006)
- [\*The Business Value of IT Outsourcing Benchmark Report\*](#) (July 2006)
- [\*Enterprise Service Bus and SOA Middleware\*](#) (June 2006)
- [\*Achieving More Value from Enterprise Applications Benchmark Report\*](#) (May 2006)
- [\*The SOA in IT Benchmark Report\*](#) (December 2005)
- [\*Building Better Composite Applications Research Brief \(October 2006\)\*](#)
- [\*Enterprise Applications: Build or Buy?\*](#) (June 2006)

Information on these and any other Aberdeen publications can be found at [www.aberdeen.com](http://www.aberdeen.com).

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