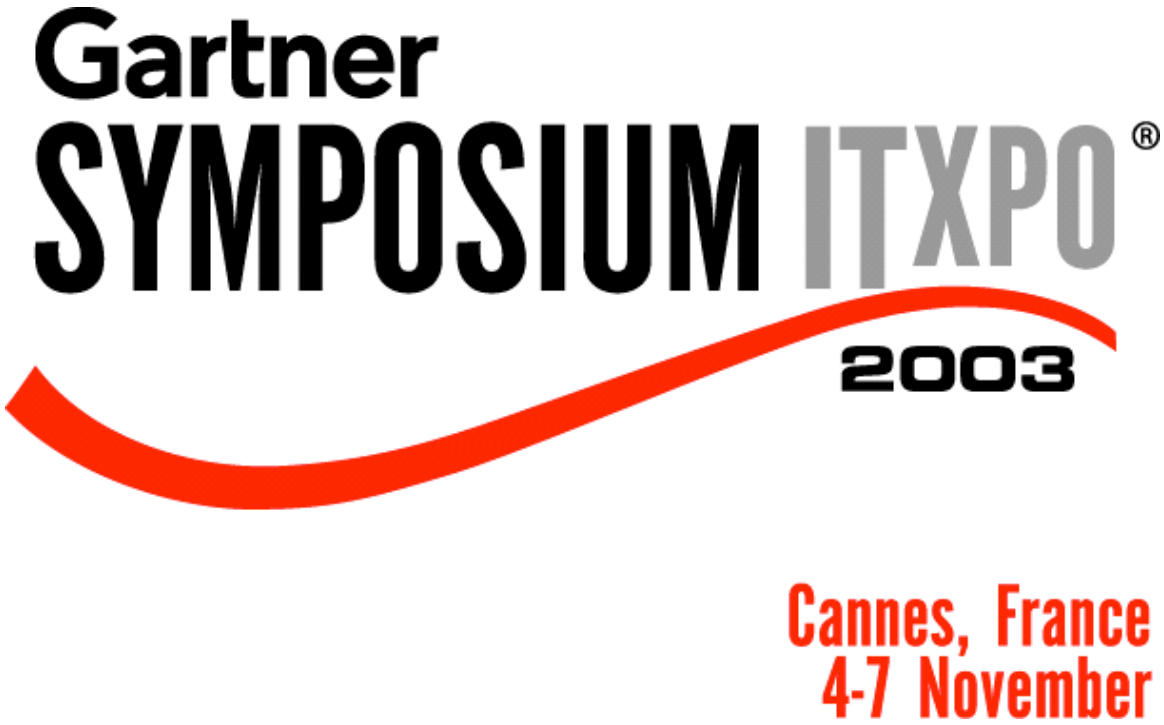
.NET vs. Java: Competition or Coexistence



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Mark Driver

Gartner

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Strategic Planning Assumptions

- **Through 2006, 95 percent of midsize to large businesses will leverage Microsoft and Java technologies as integral elements of e-business strategies (0.8 probability).**
- **Through 2006, most small and midsize businesses will struggle to support both Microsoft and Java platforms (0.8 probability).**

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Key Issues

1. **What are the pros and cons of .NET and J2EE approaches for supporting e-business solutions?**
2. **How can enterprises select the appropriate platforms for their e-business solutions?**
3. **How will the .NET and J2EE battle evolve and change during the next five years?**

Today, the bulk of independent software vendors (ISVs), systems integrators and in-house developers have consolidated their development efforts around Microsoft or Java platforms. This trend has been largely driven by a sense of uncertainty and apprehension among enterprises about developing new-generation e-business solutions on highly vendor-specific, proprietary technologies. Only Microsoft — as IT's proverbial "500-pound gorilla" — has been capable of maintaining market share with its own proprietary technology (Visual Basic, MTS, COM). Many other vendors have aligned — in part or exclusively — with Java in hopes of leveraging the current momentum around more vendor-independent Java technology markets.

As Java matures into mainstream appeal, Microsoft has countered with new .NET technology in its effort to move beyond its PC-centric foundations and leapfrog Java. In this presentation, we will address the pros and cons of each platform. Next, we will review decision criteria for successfully selecting between and managing both platforms. Finally, we will look ahead to the next five years and address how the battle between the two platforms will evolve and change.

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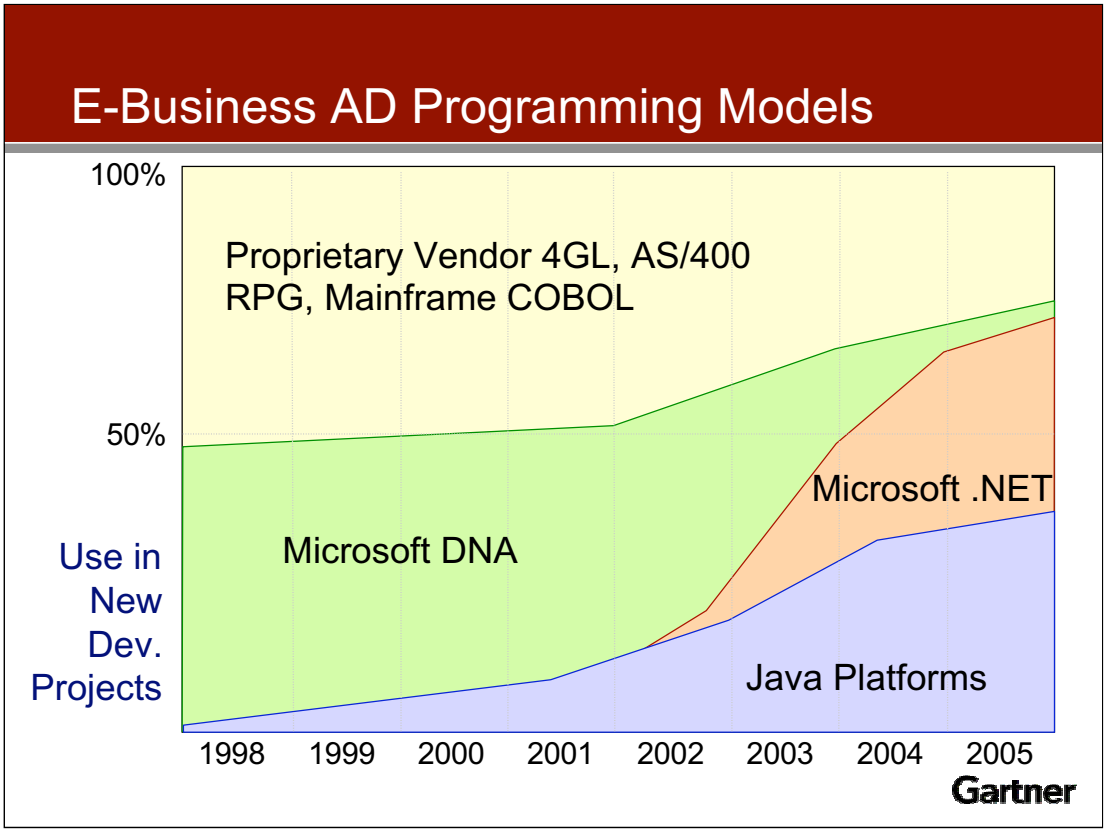
Key Issue: What are the pros and cons of .NET and J2EE approaches for supporting e-business solutions?

Strategic Planning Assumption: By 2003, 80 percent of new IT application development (AD) projects will be based on Microsoft's .NET and enterprise Java architectures (0.8 probability).



Microsoft and Java technologies will command 80 percent or more of new e-business AD initiatives during the next five years. However, neither the Microsoft platform nor the Java platform will dominate during this period. We believe both will garner roughly equal market shares. Microsoft will dominate but will not be exclusively limited to small and midsize businesses, while Java will dominate larger-scale enterprise and global computing solutions in Global 2000 markets. The growth of both platforms will come directly at the expense of other legacy and proprietary vendor technologies (such as mainframe COBOL, RPG, PowerBuilder).

Today, there is much energy around emerging Java middleware, tools and application markets; however, we believe Microsoft's emerging .NET strategy will better enable it to compete and coexist with Java during the next five years.

Action Item: Look to vendors that are closely aligned and can clearly articulate a long-term strategic relationship with either the Microsoft or Java platform technologies. In addition, look to vendors that are able to deliver integration technologies to bridge these platforms. Application integration and platform interoperability will continue to be critical elements of a comprehensive e-business strategy.

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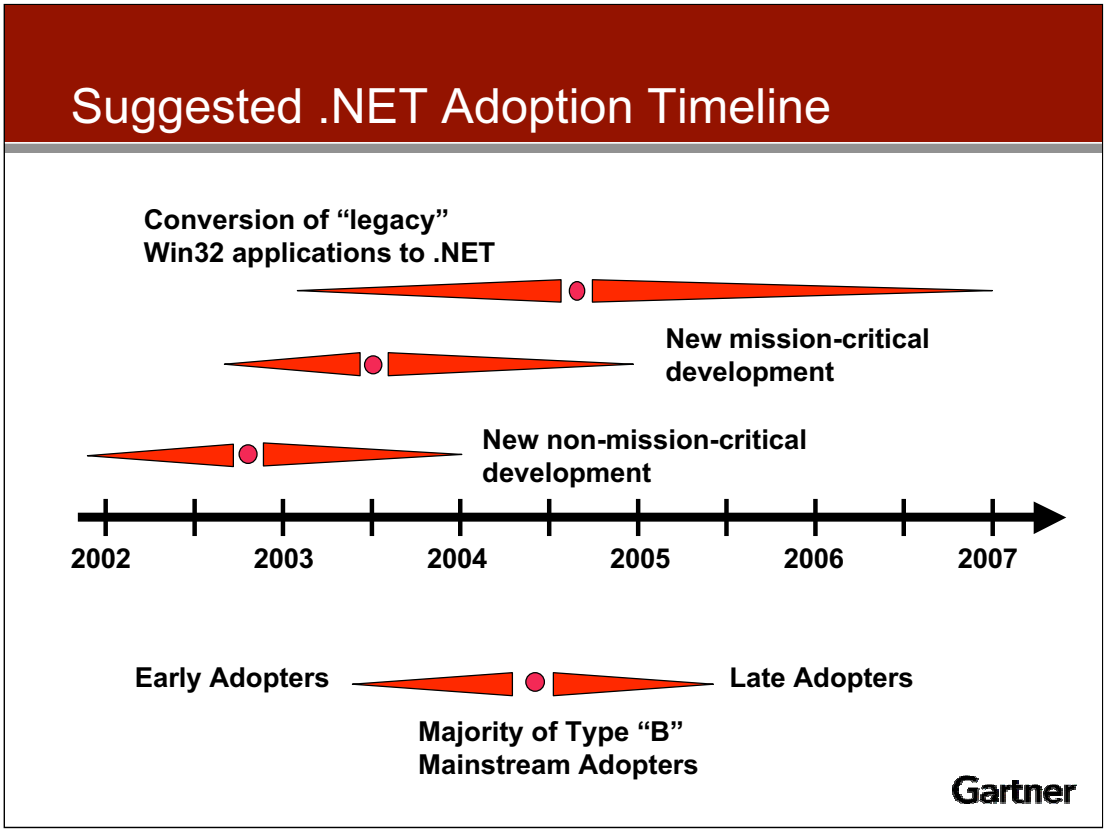

Key Issue: What are the pros and cons of .NET and J2EE approaches for supporting e-business solutions?

For the vast majority of Microsoft-centric developers, the choice of .NET migration is one of "when" but not "if". The migration to .NET is in many ways as significant as the switch from 16-bit DOS to 32-bit Windows several years ago.

Although the .NET framework introduces a number of compelling new features for developers, AD organizations must balance the promise of the new technology with a reasonable adoption strategy that takes into account the relative immaturity of the platform and also, most importantly, the skills migration and learning curve of developers as they make this transition.

Two key milestones that most organizations should keep in mind are:
New mission-critical development of strategic applications can begin today. At this time, new development on older "legacy" Win32 platforms should be phased out.

Secondly, most mainstream AD organizations should begin serious migration efforts of established Win32/COM application to the .NET framework by mid-2004 for applications expected to live beyond 2007.

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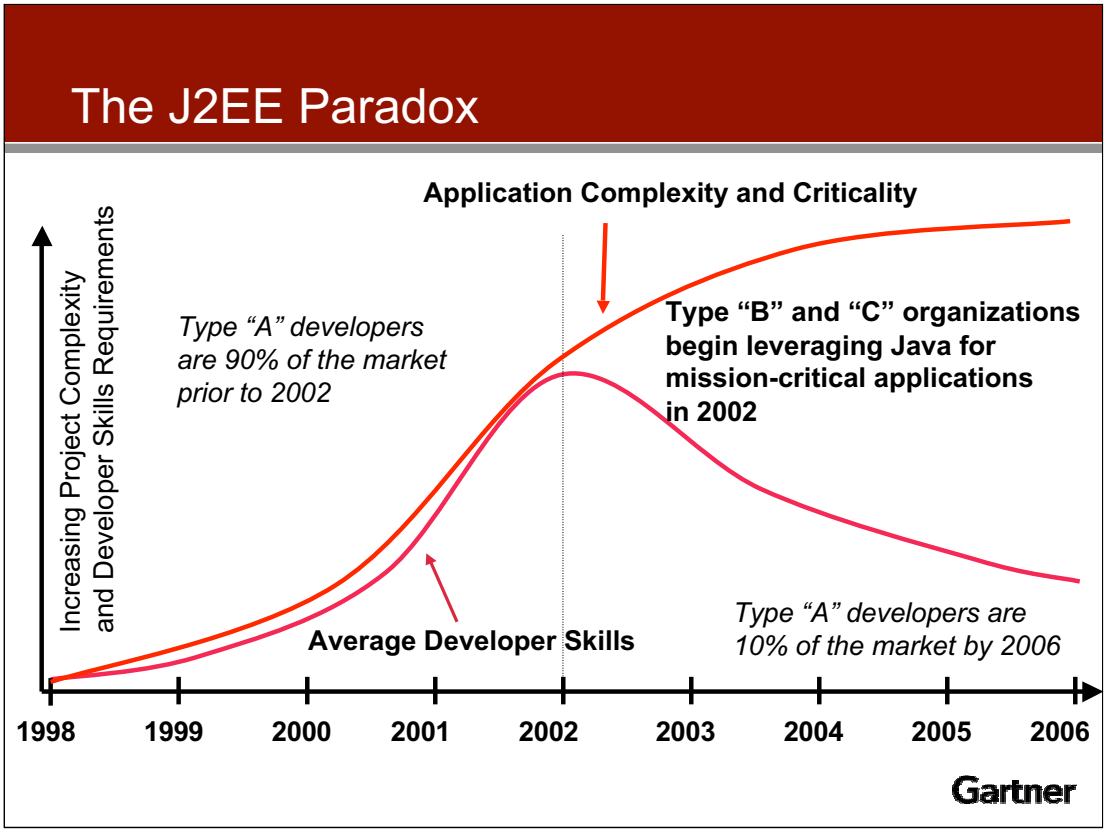
Tactical Guideline: Type B and Type C organizations must balance the adoption of J2EE with the risk of internal development. A strategy that mixes framework-based tools (that abstract and simplify J2EE AD efforts) as well as packaged applications and outsourced development should be leveraged to minimize risk through 2007.



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The paradox concerning J2EE AD efforts is growing. On one hand, developers will continue to leverage J2EE for increasingly complex and mission-critical IT solutions. The use of J2EE will span projects ranging from internal lines of business to high-profile Internet commerce infrastructures. At this time, more-conservative Type B (mainstream) and Type C (slow adopter) organizations will also turn to J2EE for the first time. As these organizations adopt J2EE, the average skill set of the Java developers will decrease as a result of constrained developer resources and limited IT budgets. This will, in turn, create a widening gap between the ability of developers to deliver complex solutions vs. the demand for large-scale and mission-critical J2EE-based solutions.

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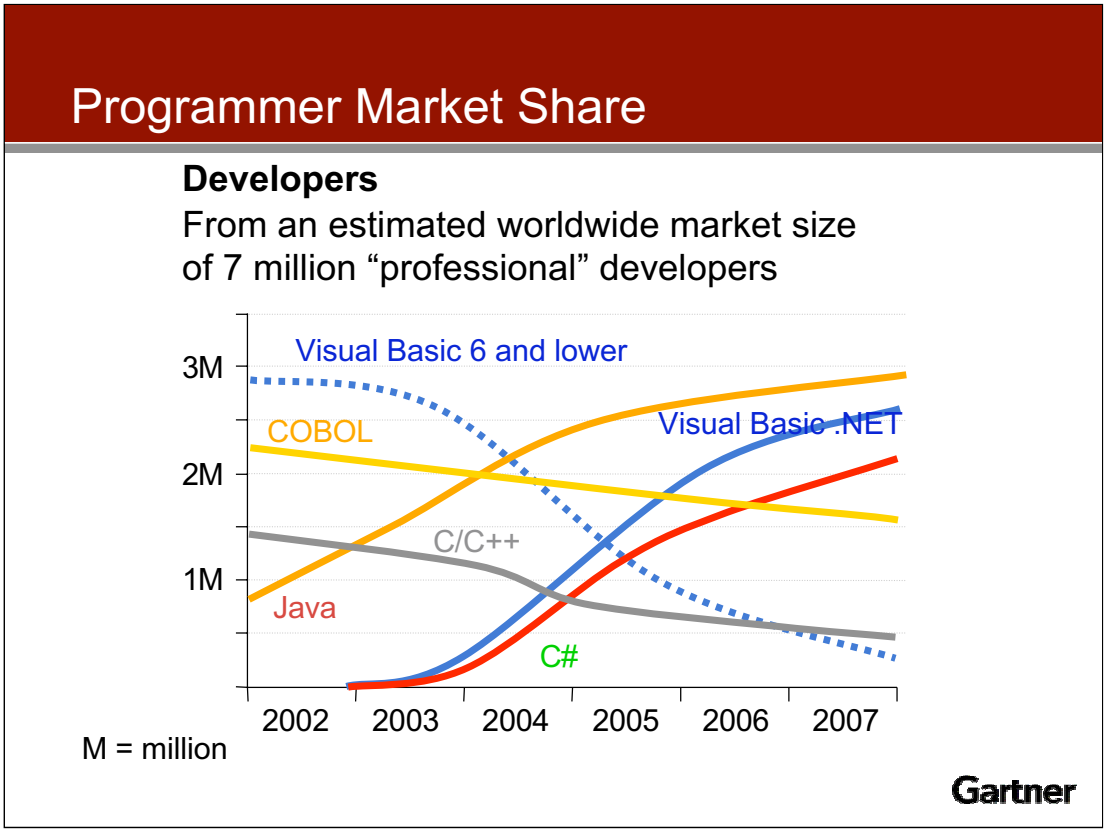
Strategic Planning Assumptions: Through 2005, 80 percent of new AD initiatives will be built with a combination of C++, Visual Basic, or Java language skills and technologies (0.8 probability).



Key Issue: What are the pros and cons of .NET and J2EE approaches for supporting e-business solutions?

We expect that C++, Visual Basic, C# and Java will be used to answer the majority of AD language demands through 2007. Most successful innovative initiatives will be based on or be highly leveraged by one of these languages. For instance, Extensible Markup Language (XML) will be leveraged by each language in emerging Web service AD models. Furthermore, emerging Web services technologies, such as Simple Object Access Protocol (SOAP), Web Services Description Language (WSDL) and Universal Description, Discovery and Integration (UDDI), will provide tighter interoperability between systems (and subsystems) that are built with these disparate language technologies. Visual Basic (VB) will continue to dominate Microsoft-centric development efforts as .NET emerges. As enterprises migrate to .NET, we expect a significant decrease in older VB dialects as VB.NET becomes established. However C# is also rapidly gaining momentum among many .NET developers. In particular, we expect 60 percent or more of current Visual C++ developers to migrate to C# as their primary .NET development language during the next three years.

Action Item: Look to innovative technologies based on or leveraged by one of the more prevalent AD languages (such as C++, Visual Basic or Java) to minimize risk and optimize return on investment.

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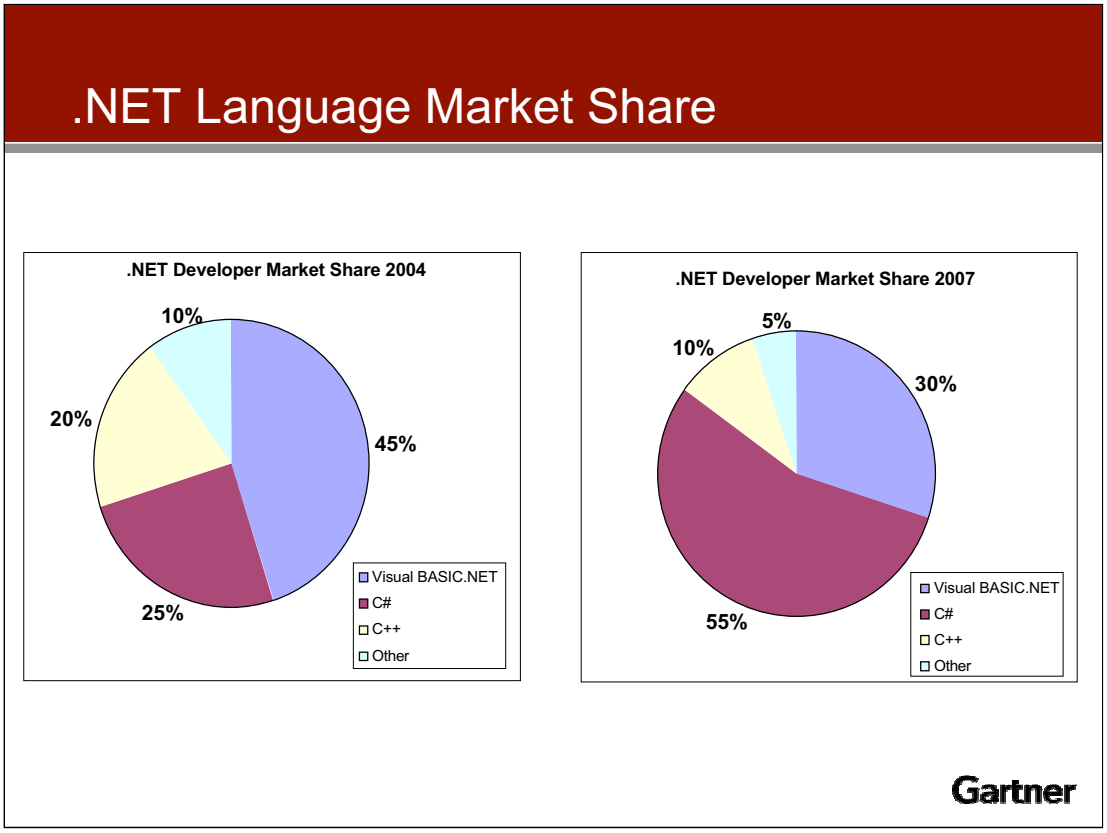
Strategic Planning Assumption: By 2007, C# will be the dominant programming language for most .NET-based development efforts (55 percent), but will share considerable market share with Visual Basic.NET (30 percent; 0.7 probability).



Key Issue: What are the pros and cons of .NET and J2EE approaches for supporting e-business solutions?

The .NET framework is designed to support many programming languages. This is a compelling and important feature of the platform; however, market dynamics will ultimately limit the dominant languages to a small subset of these compilers. Specifically, C# and Visual Basic.NET will dominate .NET development efforts for the next five years and beyond; by 2007, they will command 85 percent or more of the .NET developer base.

From 2003 to 2005, Visual Basic will lead C# based on the established large user base of Visual Basic developers who will migrate to .NET via VB.NET. However, as new developers enter the market, they will naturally migrate to C# as the "native" .NET language, and it will over take the developer base of VB.NET by 2006. The preference of C# will not be driven by technical merits of one language over the other, but rather by significant political and cultural bias against the older VB product line. In particular, C# will have a dominant market share with departmental and larger-scope projects, while VB.NET will dominate the lower-end workgroup-scale projects.

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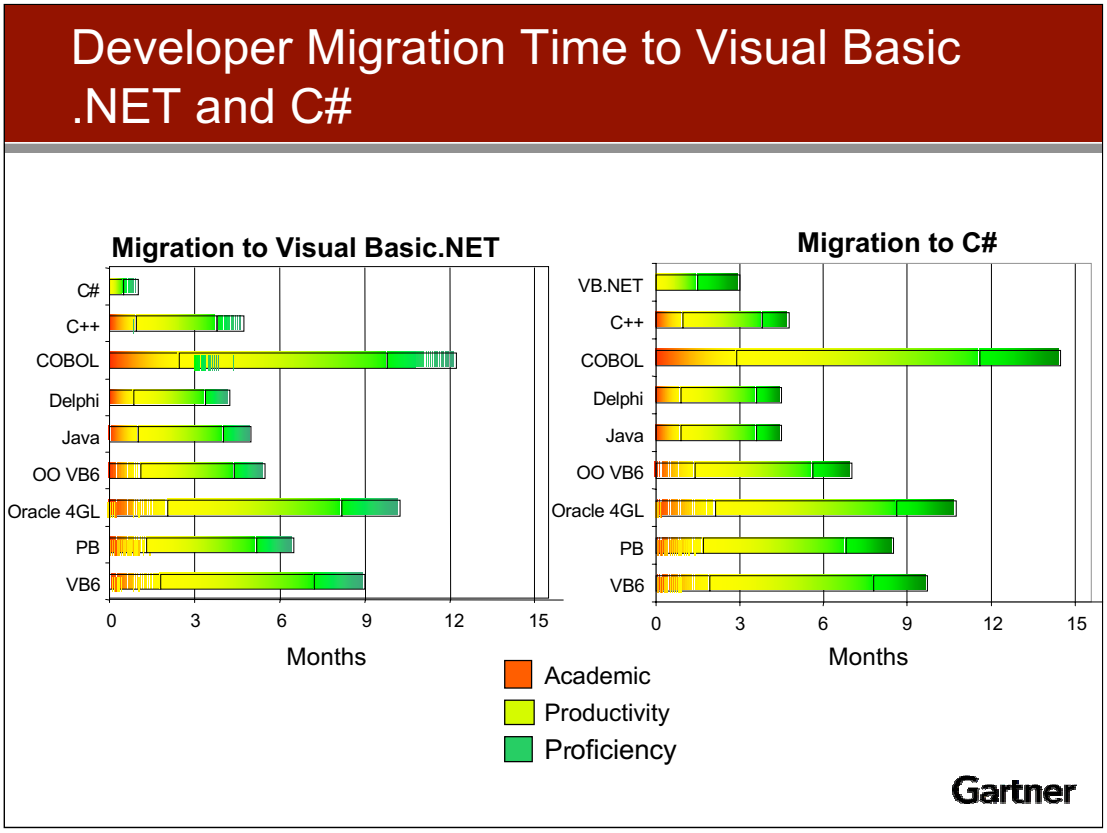
Tactical Guideline: Most developers can expect a learning curve to proficiency to last from three to nine months, but this timeline can be as long as 12 to 15 months for some.



Key Issue: What are the pros and cons of .NET and J2EE approaches for supporting e-business solutions?

Although .NET introduces a number of compelling new features for developers, it does so at the cost of considerable discontinuity. This in turn creates a significant potential learning curve for many developers as they migrate to .NET during the coming months and years.

Many factors must be taken into account when addressing this learning curve. including client/servers and Internet AD best practices, object-oriented analysis and design concepts, the .NET framework classes and services, the specific syntax of the target development language and the toolset (such as Visual Studio.NET). The degree to which developers will be familiar with some of these concepts (as opposed to learning them from scratch) is largely dependent on the language and the skills they possess before the migration efforts. To compound the difficulty of the learning curve, many developers (for example, COBOL) will be forced to learn many of the these concepts in parallel over the course of the adoption process.

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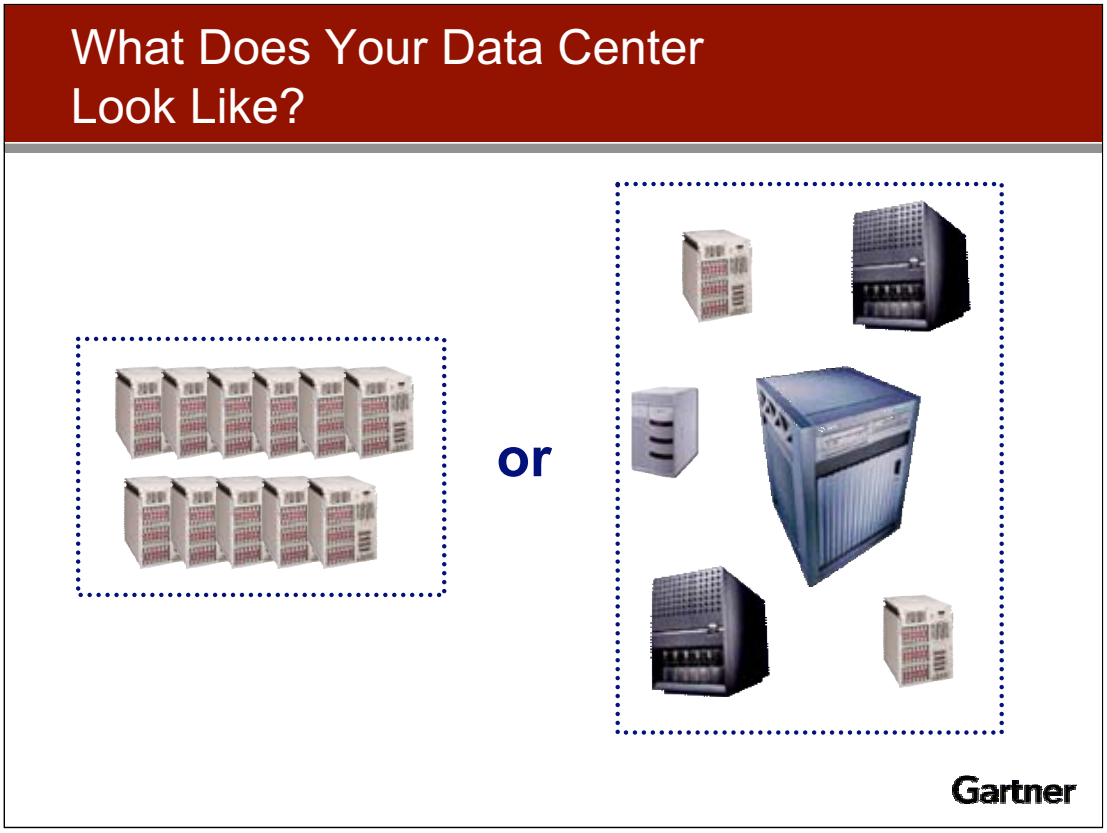

Key Issue: What are the pros and cons of .NET and J2EE approaches for supporting e-business solutions?

The vast majority of large-scale enterprises will continue to leverage Microsoft and Java technologies during the next five years. Small and midsize businesses will generally be better able to choose one technology as the primary focus. These businesses will be better able to consolidate their back-office data centers and client platforms around Windows server platforms. Consequently, Microsoft's .NET architecture will be most attractive to these businesses. Of course, these enterprises could also standardize on Java. However, most of Microsoft's market share will be dominated by, but not solely limited to, small and midsize businesses during the next five years.

Larger-scale national and multinational enterprises are more likely to have significant investments in largely heterogeneous data-center infrastructures (for example, a mixture of mainframe, AS/400, Unix and Win32). Java's cross-platform support and transportable code will drive significant investments by these larger entities toward J2EE. The emergence of Java on mobile and wireless devices will add synergy as these devices are added to typical e-business solutions.

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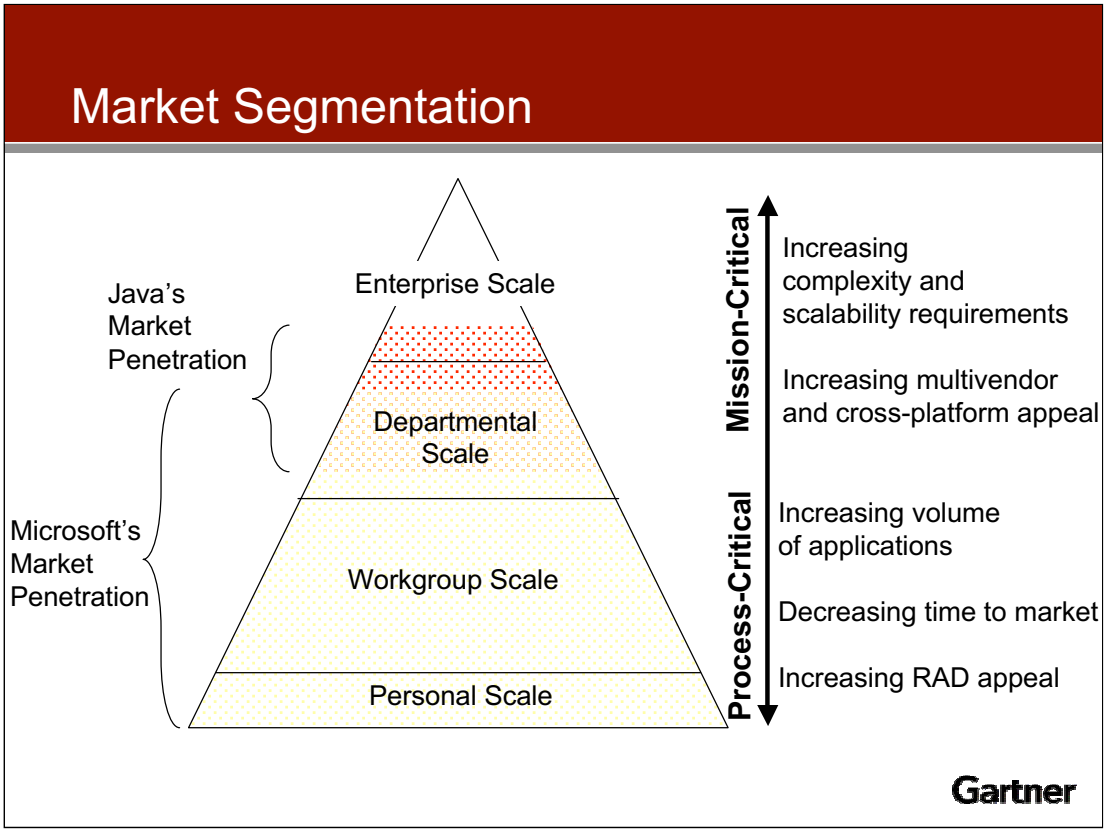
Key Issue: How can enterprises select the appropriate platforms for their e-business solutions?

Markets: Today, Java dominates e-business software markets that depend foremost on cross-platform portability and scalability, while Microsoft dominates those markets where high productivity and low cost of entry are most important.



Microsoft has traditionally dominated personal and workgroup-scale software development and commercial markets. With each subsequent release, it is further legitimized within larger-scale departmental-scale solutions. We expect .NET, in combination with Microsoft's next-generation server operating system, to continue to apply pressure in higher-end software markets during the next five years.

Java has emerged in mainstream projects and solutions residing between the low end of enterprise-scale and departmental-scale solutions. Leveraged primarily for e-business-centric solutions, Java has not yet become a serious threat to traditional client/server and front-office markets. We expect Java to become further entrenched in these markets during the next five years, but also to make serious expansions into higher-scale enterprise-mission-critical solutions, as well as make moderate gains within rapid application development (RAD)-oriented markets traditionally dominated by Microsoft-centric tools and technology.

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Strategic Planning Assumption: Through 2005, Microsoft will fail to establish its shared-source initiative as a viable alternative to an independent, open-standards approach for the .NET framework (0.7 probability).

.NET and Java 'Open' Standards Scorecard

	Java Platform	.NET Framework
Commitment to independent open standards	Rejected in favor of its own benevolent-dictatorship-based system. *Grade: F*	Retains complete proprietary control over higher-level APIs. *Grade: D+*
Commitment to industry community process	Well-supported and evolving Java Community Process (JCP) organization. *Grade: B+*	Tightly controlled shared-source and shared development process. *Grade: D+*
Commitment to Internet standards	Strong commitment to established Internet standards. *Grade: A–*	Strong support for established Internet standards and visionary in emerging Web services. *Grade A+*
Mainstream industry community support	JCP, despite some shortcomings, is widely supported by all Java technology vendors. *Grade: A–*	Highly likely to fall far short of building community support among third-party vendors. *Grade: C–*
Bottom Line Grade:	*B*	C

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Key Issue: How can enterprises select the appropriate platforms for their e-business solutions?

Microsoft has submitted a portion of its .NET framework — approximately 40 percent of the application programming interfaces (APIs) and specifications — to the European Computer Manufacturers Association (ECMA) standards body — the standards organization that controls the ECMAscript (aka JavaScript) Web scripting language. However, Microsoft has only submitted the lower-level API and has retained proprietary control over the higher-level elements of the platform. Nevertheless, this effort has successfully created the "illusion" of open-standards support for the platform, and has been a minor thorn in the side of Sun, which pulled its own standards efforts in favor of a "benevolent dictator's" role in its own pseudo-standards effort, called the Java Community Process (JCP). Despite Sun's control, however, the JCP continues to evolve and has successfully garnered widespread industry adoption among vendors. Although it has problems, the JCP is widely considered by vendors to be "good enough" for now. Alternatively, Microsoft's competing standards efforts and its own recently unveiled shared-source initiative lack the community involvement and the checks and balances necessary to create grass roots or industry momentum. Microsoft will be severely challenged during the next three years to expand this process before it is taken seriously by the larger development community.

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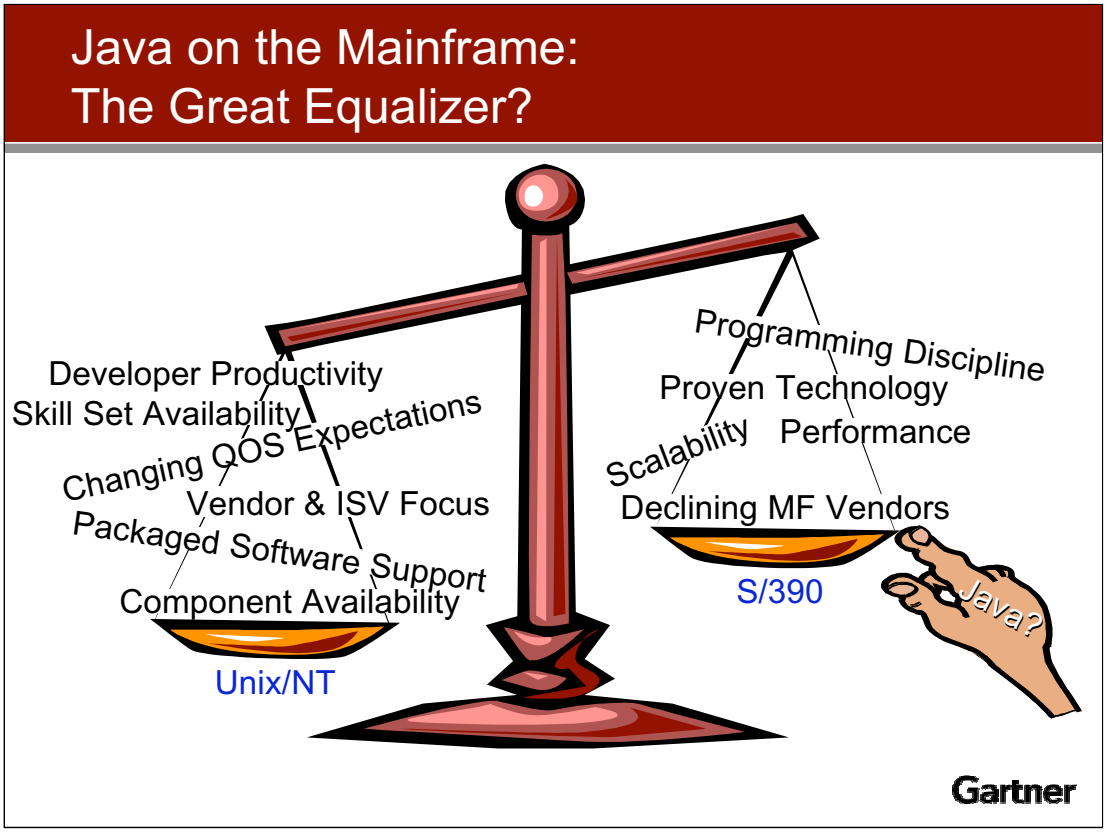
Key Issue: How will the .NET and J2EE battle evolve and change during the next five years?

Strategic Planning Assumption: By 2007, 25 percent of mainframe application portfolios will use Java in some form (0.7 probability).



Application integration, particularly when including legacy systems, represents a combination of technologies. Although a variety of object-oriented (OO), component and messaging capabilities, as well as runtime environments such as batch, online transaction processing (OLTP), Web servers or application servers, are available, the integration of applications implemented in these technologies is difficult. Can Java be the great equalizer? Not just Java the language, but J2EE as a component paradigm for application development? Representing a common approach to writing applications and defining their interactions, Java can be seen as the future integration solution across platforms. We believe IBM will have as much to do with the success and growth of Java as Sun Microsystems will. As e-business applications and their underlying technologies mature, the traditional values of reliability, availability and serviceability will become apparent. These values are a function of many things, including the underlying hardware platform. Whether IBM's laserlike focus on Java is sufficient to revitalize the S/390 (now zSeries) platform remains to be seen. It at least revitalizes the platform for consideration. Many other issues, including ISV enthusiasm, may be insurmountable.

Action Item: All AD organizations with significant mainframe applications should evaluate the emergence of Java as a viable development language on this platform.

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Strategic Planning Assumption: Through 2004, at least 95 percent of .NET applications will be deployed solely to Microsoft operating systems (0.7 probability).

.NET Beyond Windows?

- By 2004, Microsoft will directly provide the .NET framework beyond its own OS family (0.1 probability).
- By 2004, Microsoft will indirectly (through technology partnerships) support the .NET framework beyond its own OS family (0.2 probability).
- By 2004, third-party developers will independently provide a majority (at least 75 percent) of the, but not the entire, .NET framework beyond Windows (0.7 probability).

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Key Issue: How will the .NET and J2EE battle evolve and change during the next five years?

The Microsoft ".NET framework" is the technical foundation and platform on which the company will build its future products and services. This framework is unique among the company's previous technologies (for example, Win32 and COM) insofar as it is designed to function largely independently of the underlying OS; that is, applications and services deployed within the .NET framework are not tied directly to the underlying OS. Although Microsoft has made no official announcements regarding its intention to support the full .NET framework beyond Windows, it has frequently alluded to this option and has embarked on a number of initiatives to lay the foundation for this effort in the future. Here, we examine the realities of cross-platform .NET technology and discuss likely scenarios for .NET *beyond Windows* in the next five years. To suggest that this is a major shift in Microsoft's strategy is an understatement. To date, Microsoft's success has been largely tied to its capability to create and support a tightly integrated platform, from desktop productivity applications to tools to the OS. However, Microsoft's traditional strategy comes at the considerable expense of lock-in around its "one-stop-shop" proposition. For example, if an enterprise leverages Visual Basic, it also implicitly selects a Microsoft Win32 OS. This approach has worked well within its traditional customer base (PC- and "Wintel"-centric customers), but is challenged as the company attempts to expand its products and services toward larger enterprise environments with highly heterogeneous IT infrastructures.

Action Item: Development organizations should expect officially sanctioned implementation of the .NET framework to be supported on the Microsoft family of OSs exclusively through 2004.

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.NET 'SWOT'

Strengths	Weaknesses
Strong support for next-generation Internet, XML and Web-services-centric solutions	Immaturity and lack of integration into established products
Opportunities	**Threats**
Close the gap with Java vendors and outpace them in key areas (such as Web services)	Growing momentum and maturity of Java-based vendors

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Key Issue: How will the .NET and J2EE battle evolve and change during the next five years?

Microsoft .NET represents a strong evolution of the platform that introduces next-generation support for Internet, XML and Web services development. However, it is also a radical update that comes with challenges, including immaturity (new runtime, development, security) and lack of integration into the current Microsoft product line (such as Office).

During the next three to five years, .NET faces the challenge of closing the gap and outpacing Java vendors in the next generation of software as services. However, as .NET matures and evolves, so will Java. Today, Java is five years entrenched in many large-scale IS organizations and it will continue to address the threat of .NET. Microsoft will be challenged to aggressively show overwhelming return on investment (ROI) and total cost of ownership (TCO) advantages with .NET for these organizations to change course at this late date.

Action Item: .NET adopters should expect considerable expansion and evolutions of the platform during the next three years as it races to close the gap with Java and become established as a viable enterprise platform.

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Java J2EE 'SWOT'

Strengths	Weaknesses
Strong support across many vendors and platforms	Growing complexity and ease-of-use concerns
Opportunities	**Threats**
Cut .NET off while it remains immature and promote cross-platform appeal.	Potential dominance of .NET in midmarkets, pushing into the "enterprise" over time.

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Key Issue: How will the .NET and J2EE battle evolve and change during the next five years?

Java has reached a point of "good enough" maturity to become a mainstream IT platform. It enjoys very strong support among nearly all large-scale commercial software vendors, with the sole exception of Microsoft — its fiercest competitor. Java technology now runs on virtually all major operating-system and hardware platforms. Furthermore, the supply of Java-based software and developer resources is rapidly catching up with demand. However, Java vendors still face a number of challenges, including the growing size and complexity of the platform, compounded by the shifting emphasis to more-conservative mainstream IS organizations.

During the next three years, Java must continue to evolve to shore up its position as the e-business platform of choice for many large-scale commercial software companies and cut off the growing appeal of .NET. This threat will be strongest in Microsoft's traditional stronghold within midmarket accounts, but will also be a growing concern as .NET slowly pushes into more-comprehensive enterprise accounts over time.

Action Item: Java ISVs and adopters must continue to push for innovation in next-generation features, such as Web services and mobile technology, even as it becomes established in the mainstream.

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Decision Criteria Drivers

- How important is multivendor support and cross-platform deployment (for example, how heterogeneous is your data center?)
- How important is productivity vs. flexibility?
- Where are your current developer skills sets?
- With which software and system vendors do you have ongoing and long-term relationships?
- Can you afford to recoup ROI benefits over time, or do you demand a quick return on your investment?
- Are you a small, midsize or large-scale AD organization?

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- Java has the greatest ROI and TCO benefits when multivendor and cross-platform code requirements drive the demand for the technology. Microsoft .NET will be most attractive when a comprehensive and tightly integrated stack of technology and solutions is needed from a single vendor.
- In general, Java sacrifices productivity in favor of long-term flexibility, while .NET sacrifices some flexibility in favor of productivity — specifically, low cost of entry and aggressive up-front ROI benefits.
- Most large-scale organizations inevitably will be forced to support both platforms, but through 2005, will focus more strongly toward Java than .NET. However, .NET will continue to grow and will become entrenched into increasingly larger-scale and mission-critical projects during this time frame.

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Recommendations

- Small and midsize enterprises should focus on one platform as the strategic basis for e-business solutions.
- Large enterprises must support both platforms. Consequently, they should focus on integration technologies.
- Developers should focus on emerging Web services architectures on either platform.
- Enterprises should expect staffing and skill shortages for both platforms.

- Small and midsize enterprises are better able to consolidate their efforts around a single OS platform and single solution. Microsoft has "grown up" as a technology supplier for workgroup and departmental solutions, and it will continue to offer the most-attractive technology to these enterprises as they scale to enterprise- and e-business-class solutions.
- Large enterprises will be compelled to support both platforms. Java will generally be most attractive because of wide vendor support and its cross-platform characteristics. However, Microsoft technologies will also be leveraged. Consequently, application integration strategies must be developed to manage interoperability between the technologies.
- Starting in 2001, emerging Web services models began to dominate new e-business development initiatives for both platforms, introducing significant new technologies and best practices.
- Driven by continued explosive growth of e-business projects, emerging Web services technologies, and mobile and wireless device adoption, new skill requirements will exacerbate the current resource shortages for the foreseeable future.

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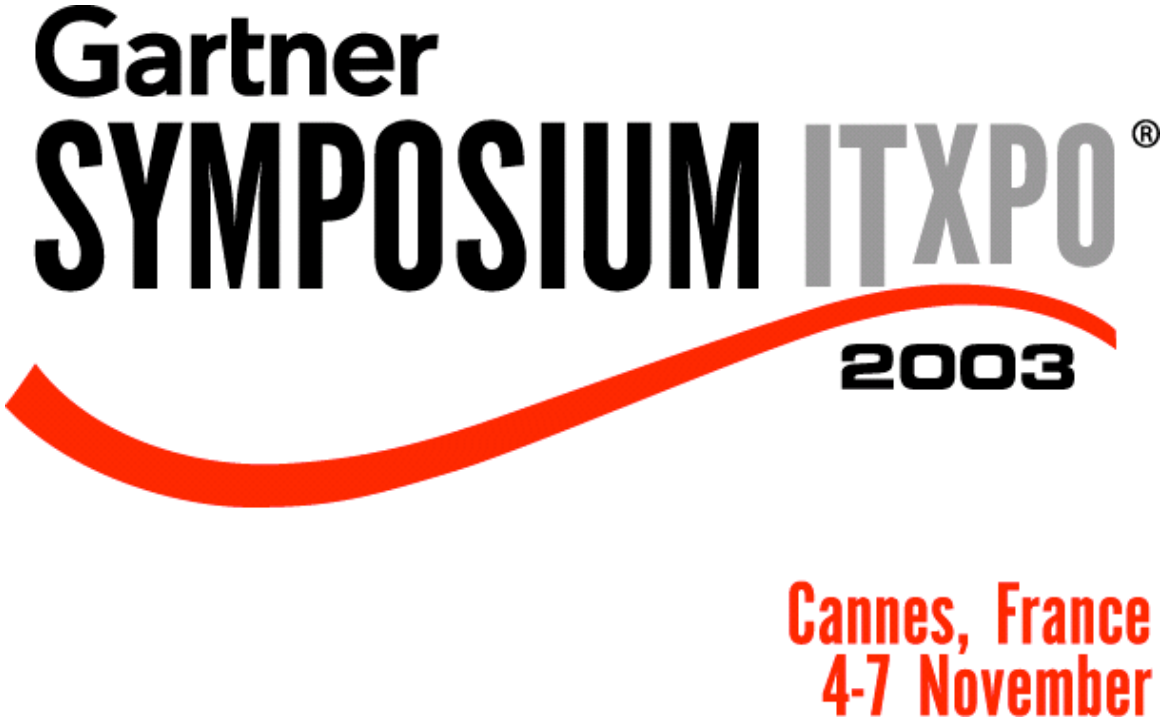

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