

1. **What will be the critical dynamics in the AD market affecting users and vendors through 2000?**
2. **What AD strategies, technologies and vendors will provide organizations with the most effective solutions for achieving competitive advantage through 2000?**

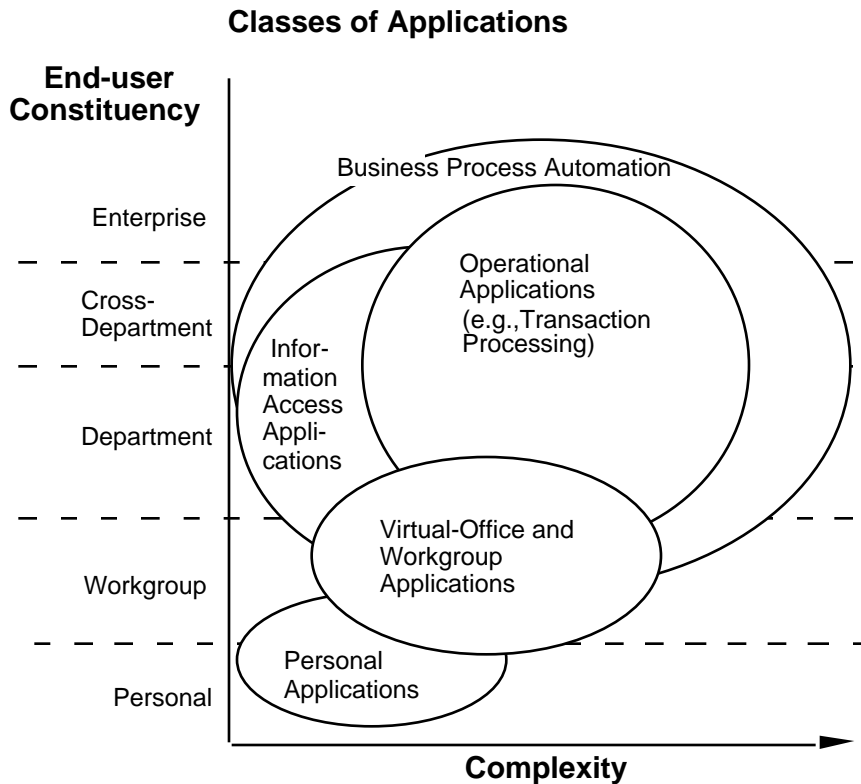
Applications Development & Management Strategies (ADM) Core Topics:

- Management, Applications Architecture and Emerging Issues
- Business Process Re-engineering Methods, Tools and Technology and BP Automation
- Applications Development Technology Investment Strategies
- Methods, Process and Project Management
- Legacy Systems and Re-engineering Technology
- Enterprise Applications Development
- Workgroup Applications Development
- Object and Component Development
- Applications Development Support Technology



What will be the critical dynamics in the AD market affecting users and vendors through 2000?

Reader Notes



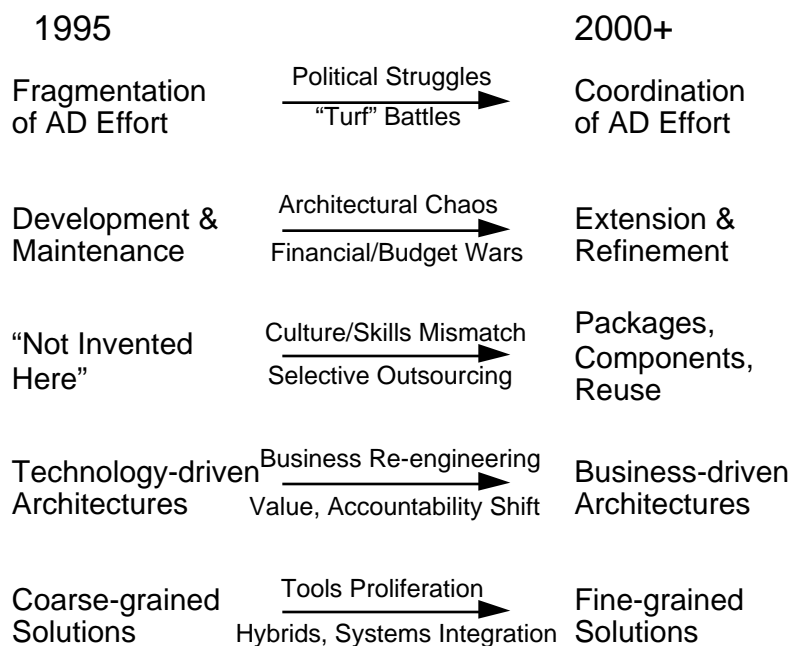
Source: Gartner Group

In last year's ADM scenario we discussed the many different classes of applications emerging. To address all the varied requirements generated by these applications across a broad spectrum, we found that there would emerge no "silver bullet" applications development tool or technology through the foreseeable planning horizon. Further, "nontraditional" applications, such as hybrid office, workflow and BPA systems, were beginning to have significant impact on the development effort, as well. To succeed, these systems would require incorporating entirely new types of still nascent technology into the development effort. These findings remain more true than ever as we present our five-year planning scenario for 1995.

In this 1995 scenario for ADM, we identify several new key trends that will impact applications developers through the next five years.



Applications Development Trends in Transition



Source: Gartner Group

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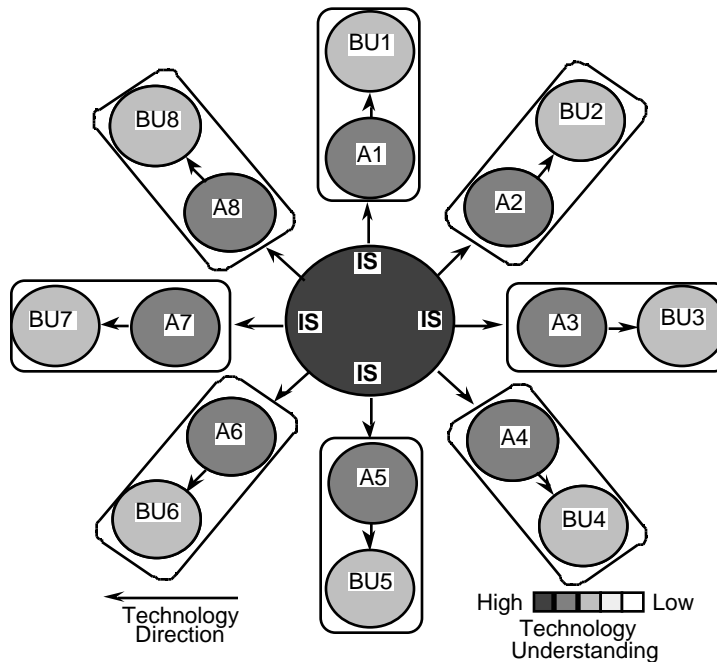
Running as an undercurrent to these key trends, we see a number of recurring themes:

- 1) Convergence — of technologies, organizations, methods and decision points — will have an enormous impact on future buying and implementation decisions.
- 2) The lines between central IS and decentralized BUs are breaking down to the point where it will sometimes be difficult to distinguish clearly between the two.
- 3) Cultural, political and organizational maturity issues are becoming the primary gating factors to progress.
- 4) The gap is widening between Type A/B+ organizations, who will be effectively taking on the role of internal systems integrators, and Type B-/C organizations, who lack the skills and organizational maturity required.
- 5) Tools/technology-focused solutions are being replaced by business-focused IT solutions.



By 2000, 70 percent of all new applications will be developed by business unit developers outside of IS, often in close collaboration with IS professionals providing specialty skills when required (0.8 probability).

Coordinated Hybrid AD Organization



Source: Gartner Group

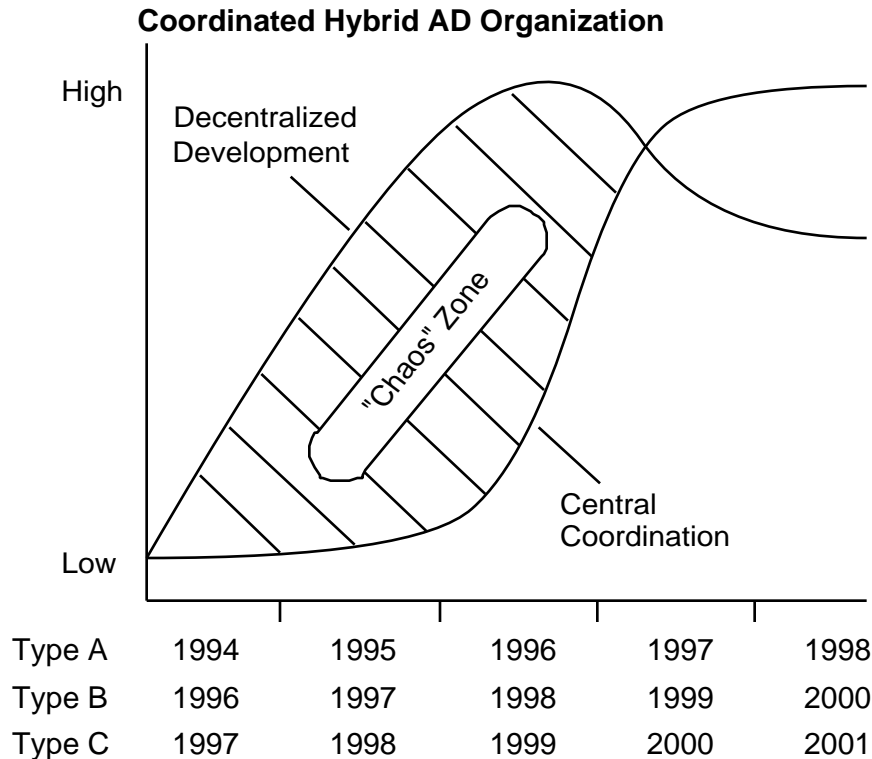
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Applications development has exploded well beyond the scope of most IS organizations' ability to control it. Low-cost tools and new development technologies hold promises of rapid solutions deployment for BUs long frustrated by IS' inability to deliver quickly on their requirements. As a result, these tools are filtering into decentralized BU organizations at a dramatic pace. While such tools may provide immediate term, localized benefits at the BU level, in aggregate, they threaten to dismantle any architecture and/or infrastructure that the central AD organization attempts to install across the enterprise. The potential for architectural chaos and technology churning, at great expense to the enterprise, is enormous.

Central AD organizations, having lost the ability to control these disparate efforts, must find new ways and new organizations to bring together these potentially competing objectives.



By 2000, all effective IT organizations will provide central coordination of decentralized AD activities, either through internally managed infrastructure and specialty centers or through selective outsourcing (0.6 probability).



Source: Gartner Group

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Decentralization of the development effort will continue to outpace the organization's ability to support these efforts through central coordination. Central coordination will lag, but will be critical in achieving the overall objectives of the enterprise. During the period of chaos, where sufficient central coordination is unavailable, some form of outsourcing will be the only answer for many organizations. Type A organizations will be likely to use "selective" outsourcing, e.g., specialty centers, to bring critical skills and transition technology strategically into the organization. Type C organizations are more prone to outsource for cost efficiencies and may choose to outsource major portions or even all of the AD effort. Type B organizations may find themselves on a perilous fence — with too much invested to outsource the entire AD effort, but too little knowledge and/or maturity to know what or how to outsource selectively.



Through 2000, 85 percent of existing applications will migrate to a form of C/S through the use of frontware, partial rewrites, salvaging or complete replacement (0.8 probability).

Reader Notes

Legacy Transition to Client/Server

| | GUI | Data | Business Logic | Rewrite |
|--------------|---------------|------|----------------|---------|
| Legacy No. 1 | → | | | |
| Legacy No. 2 | | ↔ | | |
| Legacy No. 3 | | | ↔ | |
| Legacy No. 4 | | | | _____ |
| Legacy No. 5 | Retire | | | |

Source: Gartner Group

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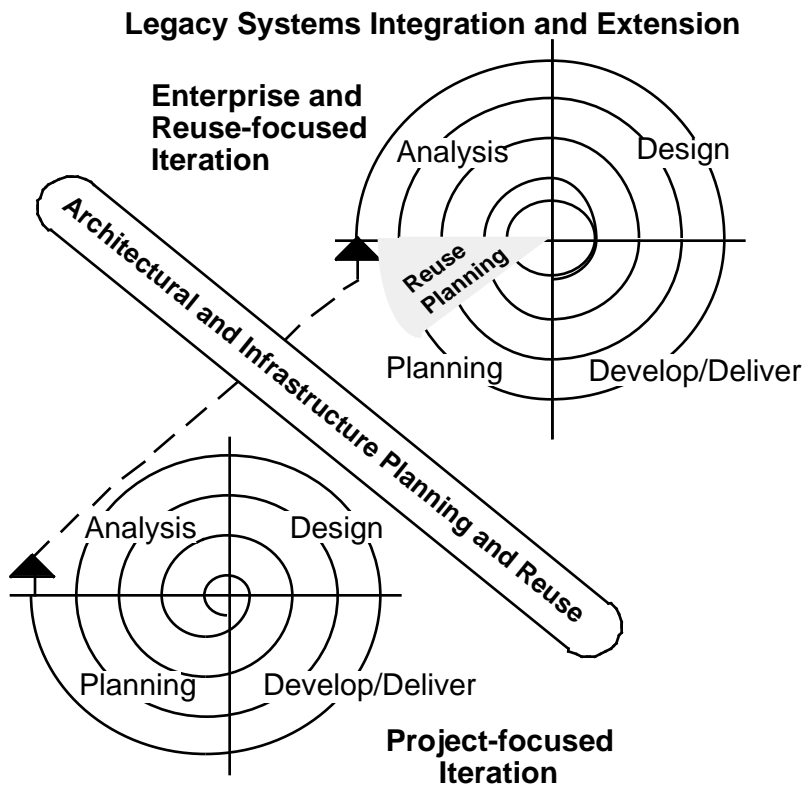
Even with new tools, techniques and methods gaining acceptance, applications development and maintenance efforts are still largely separate activities in most AD organizations.

As huge percentages of legacy portfolios are migrated to new platforms and environments, and as organizations struggle to find new and effective means of achieving reuse, this separation will evaporate. Development organizations, tools and technologies must evolve to integrate the migration and extension of legacy functionality into new AD efforts, using the same tools, methods, skills, people and environments.



By 2000, at least 40 percent of all organizations' legacy assets will be reused through ADEs that enable selective engineering (0.8 probability).

Reader Notes



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Reuse is about more than code. To be effective, reuse strategies must encompass methods, architectures, skills, tools, people, infrastructure and more.

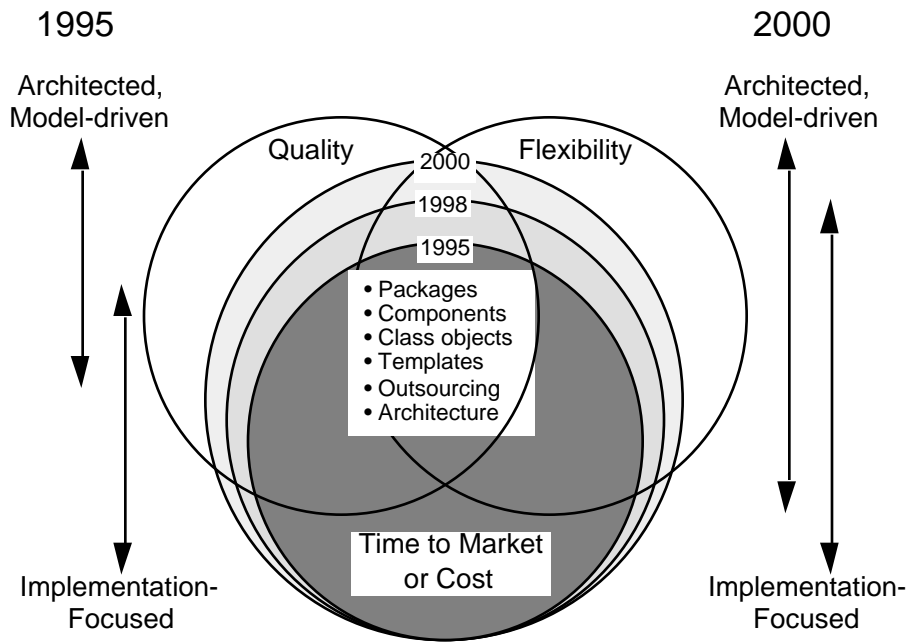
Selective engineering is defined as the integration of legacy-oriented methods and tools with new development techniques and environments, e.g., 3GL workbenches, CASE, C/S and object technologies. Selective engineering requires a transition/integration plan that considers people and their skills, the method(s) followed and the tools and technologies available to support applications development and maintenance.

Strategies and methods will need to be put in place that allow both rapid development of BU-focused projects, as well as the extension and scaling of those projects into larger, more complex, enterprise initiatives that leverage reuse principles.



By 1997, the most successful AD organizations will provide incentives to their developers, not based on how much functionality they develop, but on how much functionality they deliver, through either development or reuse.

Competing Objectives in AD



Source: Gartner Group

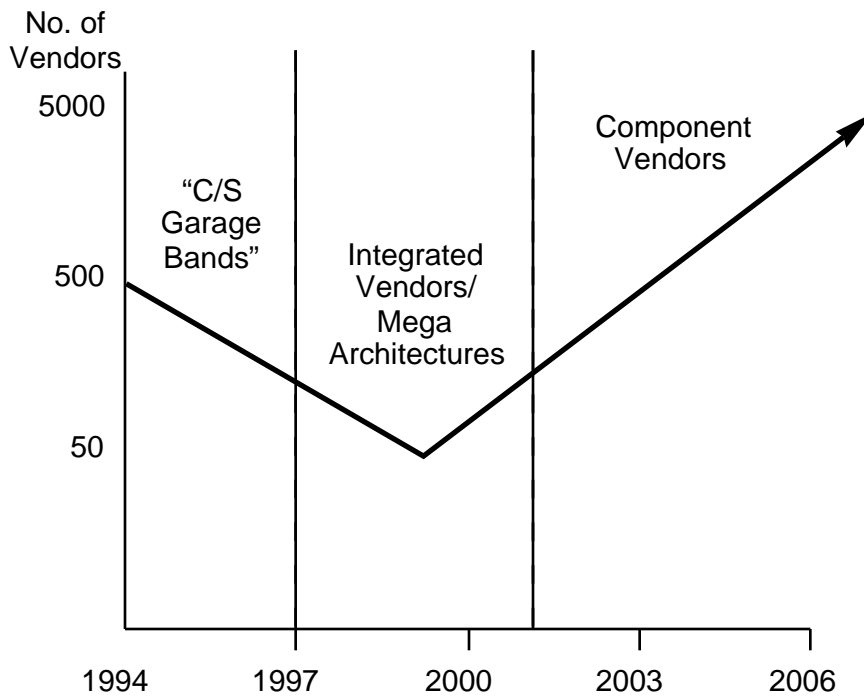
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Time to market will be an increasingly important factor in virtually all new applications under development, independent of whether the applications are developed with an architected, model-driven approach or an implementation-focused one. To achieve time-to-market objectives, AD organizations must overcome historical “not invented here” attitudes and look to buy, reuse and/or outsource significant functional components. Organizations must carefully identify which core functional components will bring competitive advantage. These should be developed internally, while others can be bought. Reusable functionality will come in the form of application packages, off-the-shelf component and object libraries and internally developed components and objects. Also, organizational maturity will become an increasingly critical factor in time to market, as it dictates the enterprise’s ability to assimilate and leverage the new technologies and strategies required to achieve reuse on a broad scale.



Through 2000, packaged software vendors will remain split on the issue of proprietary vs. commercially available tools, with the momentum swinging decidedly toward those delivering functionality as objects, components or templates using widely available frameworks and/or development tools (0.8 probability).

Packaged Software Vendors



Source: Gartner Group

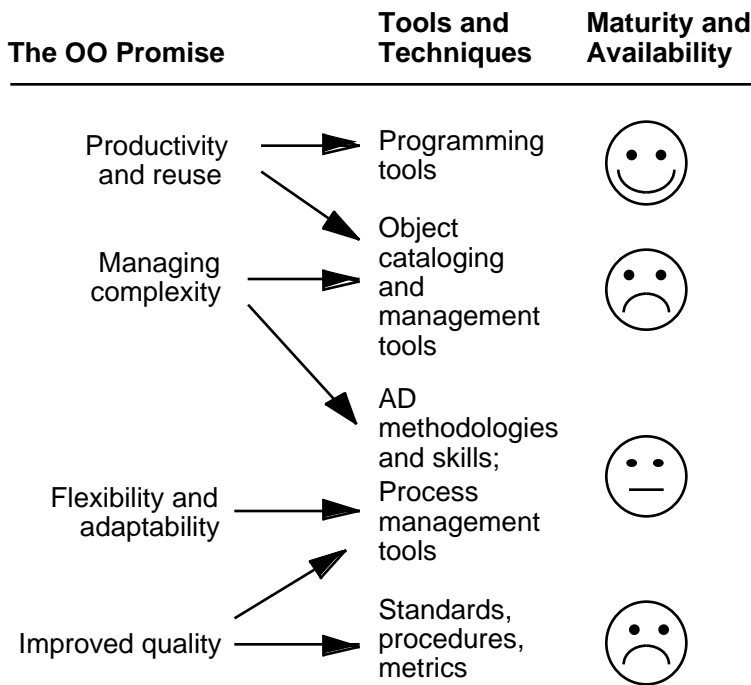
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To address emerging time-to-market requirements, the business will demand that if functionality can be bought faster/better/cheaper than it can be developed internally, then it should be "bought in." The delivery of OO technology and a few frameworks for business applications will create an explosion in the number of vendors delivering business application packages. Packaged software vendors must decide during the next five years if they want to sell frameworks, objects or assembly services for different industries. Those vendors that are not leveraged to prosper in the expanding world of partnerships will find it difficult to maintain their current levels of success. Business users evaluating such functionality must carefully weigh the benefits vs. the risks of inheriting potentially rigid, noncompliant architectures. Further, architectures and infrastructures must be developed for flexibility to maximize the likelihood of success in assimilating third-party-developed functionality.



By 2000, at least five in 10 new applications will use object technology for user interfaces and complex client and server functionality (0.7 probability).

Object-Orientation: Promise vs. Reality



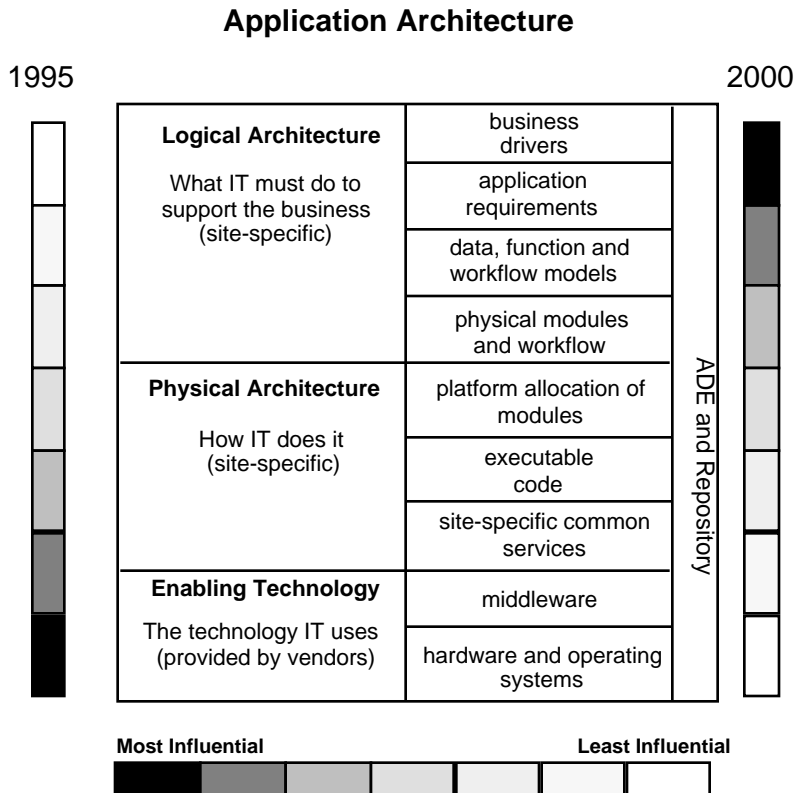
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“Class objects” (in object-oriented paradigms) can significantly lower the technical barriers to software reuse. Component objects do less in this regard, but will be useful in leveraging and managing off-the-shelf functionality. In either case, object reuse cannot be achieved unless objects can be described, stored, browsed, searched and retrieved effectively. However, powerful object/component repositories, coupled with supporting integrated toolsets, will not be available before 1998 (0.8 probability). Such object-management technology lags far behind object-development technology and will remain one of the major technical barriers to this type of reuse. Other barriers to software reuse will include cultural, organizational and political hurdles that may ultimately prove far more daunting for many organizations than any technical challenges.



While many organizations are beginning to put applications architectures in place, these remain largely focused on, and constrained by, the lower levels of technology infrastructure.



Source: Gartner Group

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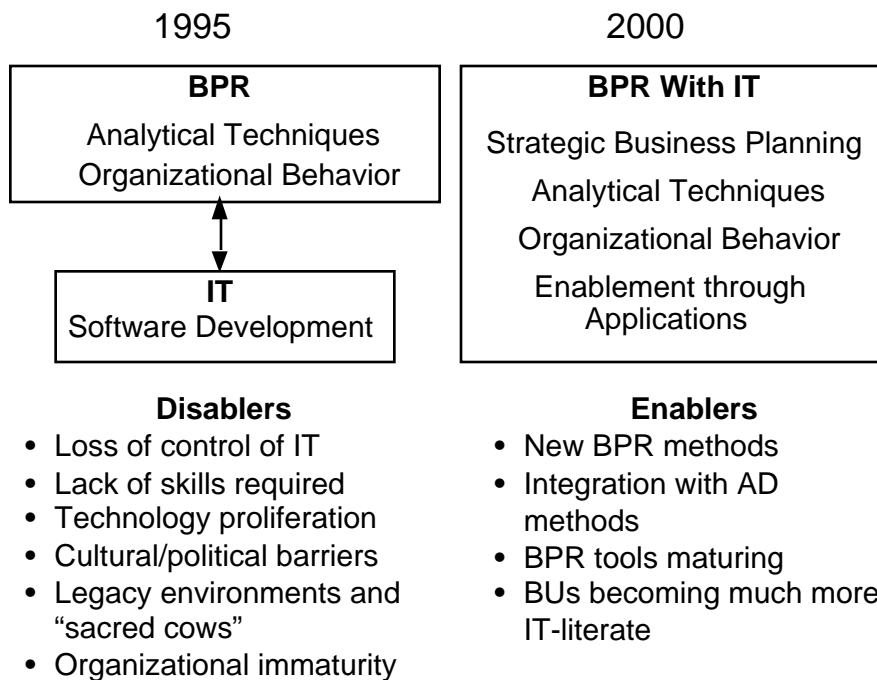
Enabling information technologies (e.g., hardware, operating systems, middleware and applications development tools) are accelerating their frantic pace of change. To provide a framework for adopting and leveraging new technologies, application architectures are emerging in many organizations, but they remain mostly driven from the bottom up by the constraints of existing, available and/or cost-effective technologies. As enabling technologies are replaced at increasingly frequent intervals, the enormous investment in the logical layers of the architecture must remain intact. Organizations must be able to justify new investments in technology and in applications through more direct analysis of the support of critical business requirements. Within the application architecture, business objectives will drive technology, instead of technology gating the capabilities of the business. Businesses that do not adopt this model will fail.



By 1999, market-leading software development methodologies will incorporate BPR methods (0.8 probability).

Reader Notes

BPR Convergence With AD



Source: Gartner Group

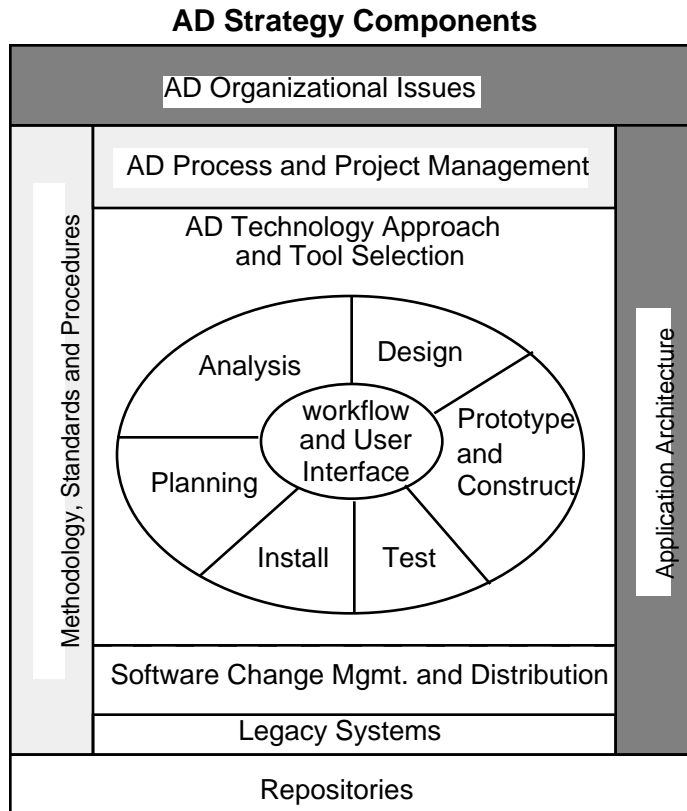
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Software development that does not have clear business justification will fail.

Moving forward, AD will be seen as an enabler to new, more effective business processes. Business justification for AD will be derived directly from objectives defined by BPR and related efforts. AD organizations must begin to acquire the skills required for success, such as operations research, strategic business planning, organizational behavior and financial analysis. Also, new performance metrics will be needed to ensure that all development activities are tied to meeting specific, measurable business goals.



What AD strategies, technologies and vendors will provide organizations with the most effective solutions for achieving competitive advantage through 2000?



Source: Gartner Group

In last year's scenario, we presented the essential components of an effective AD strategy. This year we explore the impact that the next five years will have on these components.

Continuing with, and reinforcing the theme of last year's messages, we see:

- Expanding toolsets
- Converging functionality and market spaces
- Dramatic consolidation, already occurring in many sectors

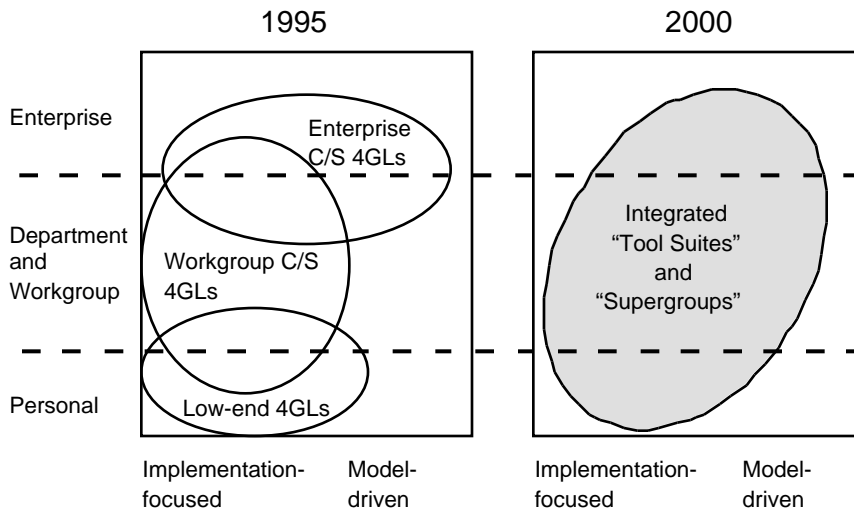
Moving forward, we see specific convergence of:

- Organizational and architectural issues
- Applications development, modeling, repository, SCM, testing and legacy systems issues
- Methodology, process management and project management



By 2000, all leading C/S 4GL vendors will either participate in an alliance or have their own single-vendor solution that provides an integrated enterprise-to-desktop AD tool suite (0.7 probability).

AD Tools: Consolidation and Convergence



Next-Generation “Weasel” Words

- Enterprise
- Object-oriented
- Multitiered
- Partitioning
- Scalable
- Multiuser
- Open
- Integrated
- Portable

Source: Gartner Group

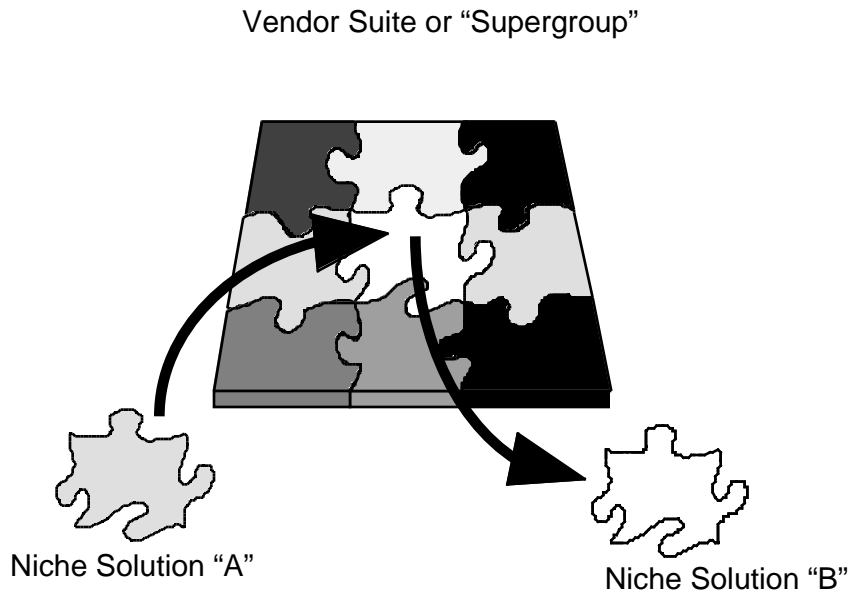
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The AD tools market (CASE, C/S, 4GLs, re-engineering, repository, testing, maintenance, etc.) is undergoing convergence. During the period from 1995 to 2000, the full emergence of both supply and demand will spread the application of C/S AD tools across an increasingly large spectrum of applications. Out of this evolution will emerge the integrated “tool suite.” These tool suites will aim to integrate traditional and emerging C/S AD tool functionalities around a single development framework and common repository. With users now comfortable with C/S applications on a workgroup level, the first wave of true enterprise C/S applications development will take place en masse during the next three years. Through 1993, the primary means for C/S 4GL vendors to achieve competitive differentiation was to bring forth new functionality that enabled simpler and/or more productive development of straightforward C/S applications. Now most vendors are attempting to expand their tools to address wider ranges of application requirements well beyond their current capabilities.



By 2000, single-approach ADE solutions will be largely replaced by finer-grained solutions enabling the use of specialized tools and functionality from multiple sources within a common framework (0.6 probability).

Applications Development Tool “Suites”



Source: Gartner Group

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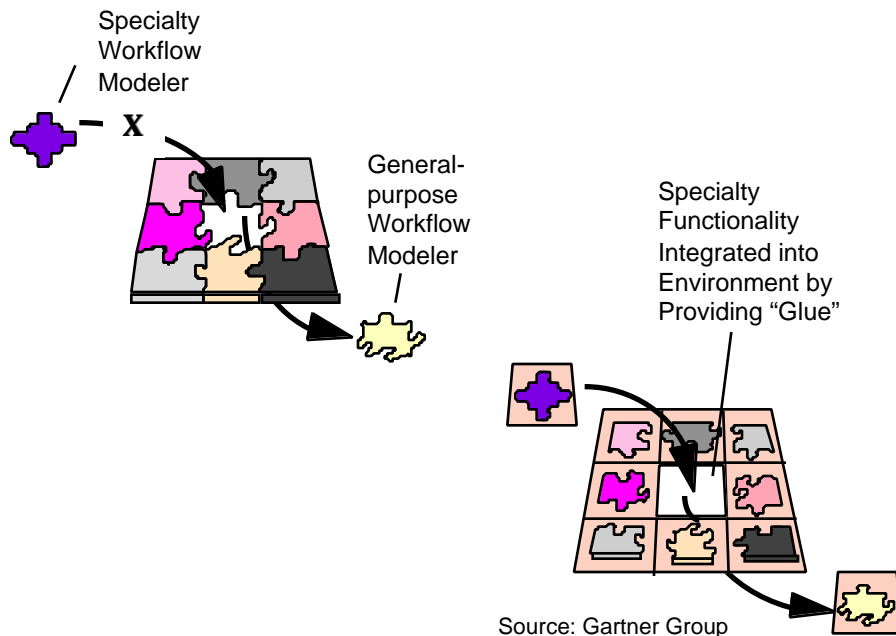
The balance of this decade will see tools migrate away from coarse-grained, single-vendor supplied AD environments, to more finely grained, multivendor solutions. This era will be characterized by: interface-driven “sharing” vs. full integration; strategic alliances and vendor “supergroups” vs. disparate, overlapping, “best of breed” solutions; and de facto standards and proprietary frameworks vs. industry standards. Larger vendors will provide the frameworks, potentially offering much of the functionality within a “suite” or “supergroup,” but these vendors will also compete on their ability to provide granular solutions with published interfaces, enabling the use of boutique/specialty-vendor supplied functionality. Supergroups will compete on: 1) breadth of functionality available, and 2) depth/specialization of functionality available through partners. Tools will be selected based on their ability to do what they do well and to interoperate with other tools within an overall suite, not on their ability to do everything.



While vendors will begin to provide more granular, interoperable AD tools through 2000, successful AD organizations will supplement vendor-supplied interoperability by taking on the role of internal systems/solutions integrators.

Reader Notes

AD “Systems Integration”



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Emerging requirements, especially those targeted at specific business objectives and achieving new levels of competitive advantage, will drive requirements to leverage “specialty” functionality, e.g., workflow, image, multimedia, groupware and BI, within development and deployment environments. While emerging vendor suites will begin to provide more flexible solutions that span a range of applications requirements, AD organizations will still, and more than ever, need to take on the role of internal systems integrator if they are to be able to take advantage of these new technologies. AD organizations must understand where the key integration interfaces will need to be, and then design their technical architectures around those interfaces. Methodologies must remain flexible enough to accommodate critical new elements. Selective outsourcing can also be used as a powerful tool, positioning organizations to bring in new specialty skills with minimum risk and time to market.



Effective applications development and management strategies must address a host of key issues during the next five years.

Applications Development and Management Strategies

| | | |
|---|--|---|
| Management, Applications Architecture and Emerging Issues | | |
| BPR Methods, Tools and Technology and BPA | | |
| Applications Development Technology Investment Strategies | | |
| Methods, Process and Project Management | | |
| Legacy Systems and Re-engineering Technology | Enterprise Applications Development Technology | Workgroup Applications Development Technology |
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| Applications Development Support Technology | | |

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To do their jobs effectively through the end of the decade, organizations responsible for applications development and management strategies must focus on a wealth of key issues in a number of critical areas. In an era of convergence, many of these areas will have great impact on one another. For example:

- BPR methods and tools will have more and more impact on AD methodologies
- Object and component development will have increasing impact across all aspects of both workgroup and enterprise AD
- AD support technology will be tightly woven into AD tool suites
- Legacy systems and maintenance strategies will be integrated with new C/S AD
- Applications architectures will increasingly drive tool and technology selection
- Technology investment strategies will have greater impact on all AD selection decisions.



- By 2000, 70 percent of all new applications will be developed by business unit developers outside of IS, often in close collaboration with IS professionals providing specialty skills when required (0.8 probability).
- By 2000, all effective IT organizations will provide central coordination of decentralized AD activities, either through internally managed infrastructure and specialty centers or through selective outsourcing (0.6 probability).
- Through 2000, 85 percent of existing applications will migrate to a form of C/S through the use of frontware, partial rewrites, salvaging or complete replacement (0.8 probability).
- By 2000, at least 40 percent of all organizations' legacy assets will be reused through ADEs that enable selective engineering (0.8 probability).
- Through 2000, packaged software vendors will remain split on the issue of proprietary vs. commercially available tools, with the momentum swinging decidedly toward those delivering functionality as objects, components or templates using widely available frameworks and/or development tools (0.8 probability).
- By 2000, at least five in 10 new applications will use object technology for user interfaces and complex client and server functionality (0.7 probability).
- By 1999, market-leading software development methodologies will incorporate BPR methods (0.8 probability).
- By 2000, all leading C/S 4GL vendors will either participate in an alliance or have their own single vendor solution that provides an integrated enterprise-to-desktop AD tool suite (0.7 probability).
- By 2000, single-approach ADE solutions will be largely replaced by finer-grained solutions enabling the use of specialized tools and functionality from multiple sources within a common framework (0.6 probability).

