Hype Cycle for Application Development, 2003

Application development involves perfecting tools to speed up the process and improve application effectiveness. Trends expected include growth of the real-time enterprise and services-oriented development of applications.

Management Summary

Application development (AD) is destined for radical changes through 2008. The dominant trends will include the evolution of the real-time enterprise (RTE), with its "need for speed," and growth in service-oriented development of applications (SODA). Together with the continuing search for ways to cut costs, the RTE and SODA will encourage service-oriented architecture (SOA). Significant work is also being done to leverage legacy systems, and organizational turmoil will accompany shifts in skills and delivery models. Business process analysis (BPA) and business rule engines (BREs) will separately enable cost reductions in 2003, but together will yield even greater return on investment (ROI) in the years that follow.
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Hype Cycle for Application Development, 2003

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1.0 The Hype Cycle

Visibility

Composite Applications
Advanced Web Services
Metadata Management
Integrated SODA Frameworks
Aspect-Oriented Software Development
.NET Platform

Maturity

Technology
Trigger

Peak of Inflated Expectations

Trough of Disillusionment

Slope of Enlightenment

Plateau of Productivity

Acronym Key

ARAD  architected, rapid application development
SCCM  software change and configuration management
SODA  service-oriented development of applications

Key: Time to Plateau

○ Less than two years
○ Two to five years
○ Five to 10 years
△ More than 10 years

As of May 2003

Figure 1. Hype Cycle for Application Development, 2003

2.0 On the Rise

2.1 Aspect-Oriented Software Development

Definition: Technology for the separation of concerns in software development. The techniques of aspect-oriented software development (AOSD) make it possible to modularize cross-cutting aspects of a system.

Time to Plateau/Adoption Speed: Five to 10 years.

Justification for Hype Cycle Position/Adoption Speed: AOSD is a logical extension of objects that reduces the complexity of dealing with cross-cutting concerns that arise from the modular programming found in SODA and other SOA approaches.
Business Impact Areas: Modularized construction creates complex implementation problems for underlying services. AOSD is an approach to managing this complexity.

Analysis by James Duggan

2.2 Integrated SODA Frameworks

Definition: Integrated suites of best-of-breed tools able to perform automated architected, model-driven (AMD) SODA.

Time to Plateau/Adoption Speed: Five to 10 years.

Justification for Hype Cycle Position/Adoption Speed: Vendors with leading traditional integrated AMD products are releasing newer versions or tools for the Java 2 Platform, Enterprise Edition (J2EE) and the .NET platform. Links between BPA tools with SODA code generators or rule engines are emerging.

Business Impact Areas: Integrated tools simplify the construction of services from business requirements.


Analysis by Michael Blechar

2.3 Swarm Intelligence

Definition: Sometimes called emergent computation, this produces complex behavior from the interaction of many simple behaviors (as in societies of ants and bees). Its uses include simulation and planning.

Time to Plateau/Adoption Speed: More than 10 years.

Justification for Hype Cycle Position/Adoption Speed: Mostly still in the domain of research labs, with some limited commercial experimentation for simulation.

Business Impact Areas: Simulation and modeling.

Selected Vendors: Santa Fe Institute.

Analysis by Jackie Fenn and Alexander Linden

2.4 Metadata Management

Definition: Understanding, managing, controlling and reusing metadata is a key part of enabling SODA and SOAs and providing commonality across business and technical views of the application portfolio.

Time to Plateau/Adoption Speed: Two to five years.

Justification for Hype Cycle Position/Adoption Speed: Metadata management technology leaders have been slow to support SODA and SOA, metadata standards are evolving and vendors are beginning to address metadata semantics across their tool suites.

Business Impact Areas: Reuse initiatives and their economies require knowledge and management of the asset base.

Analysis by Michael Blechar
3.0 At the Peak

3.1 Advanced Web Services

Definition: Services in SOA or arbitrary software modules that use core Web services standards, such as Simple Object Access Protocol (SOAP), or advanced Web services standards, such as Business Process Execution Language for Web Services, for service definition and invocation and to support advanced SOA quality of service.

Time to Plateau/Adoption Speed: Two to five years.

Justification for Hype Cycle Position/Adoption Speed: Advanced Web services delivery depends on the availability of implemented standards. Most of the relevant standards have not yet been certified, and their implementations are not yet fully delivered by vendors. The projected impact of this new set of standards is not based on real production experience.

Business Impact Areas: Web services architecture, enhanced with enterprise-class quality of service, will enable businesses to complete more advanced and business-critical transactions over standards-based networks.


Analysis by Yefim Natis

3.2 Composite Applications

Definition: Logical combinations of business or technical "pseudo services" and services that can be represented as microflow.

Time to Plateau/Adoption Speed: Less than two years.

Justification for Hype Cycle Position/Adoption Speed: Aggressive efforts from vendors and users to realize the value of established functionality (customized, package and public domain). Drivers include business and technical needs.

Business Impact Areas: In a drive to do more with less, businesses are looking to reuse proven functionality in new ways. Composite applications enable new methods for combining new and established functionality.

Selected Vendors: BEA Systems, CommerceQuest, Vitria Technology and WRQ.

Analysis by Jim Sinur

3.3 .NET Platform

Definition: A set of Microsoft software technologies for enabling software integration through the use of Web services.

Time to Plateau/Adoption Speed: Two to five years.

Justification for Hype Cycle Position/Adoption Speed: .NET is closing the technical gap with J2EE. On the other hand, .NET forces developers to learn new tools, best practices, development languages and architectural models.
Hype Cycle for Application Development, 2003

Business Impact Areas: Higher levels of reuse and productivity from service-based development.

Analysis by James Duggan

3.4 Project Portfolio Management

Definition: Supports organizational and procedural change and metrics collection through project and resource management applications.

Time to Plateau/Adoption Speed: Two to five years.

Justification for Hype Cycle Position/Adoption Speed: Lack of practices, tools and information to facilitate near-real-time control can frustrate project portfolio management.

Business Impact Areas: Significant ROI for project-intensive organizations through improved planning, resource use, project change management and project communications.

Analysis by Matt Light

4.0 Sliding Into the Trough

4.1 Business Process Management

Definition: Business process management (BPM) is an industry-coined term that defines a set of related technologies that help manage business processes and flows, especially across traditional organizational and systems boundaries.

Time to Plateau/Adoption Speed: Less than two years.

Justification for Hype Cycle Position/Adoption Speed: BPM is an overcrowded market that is likely to see consolidation in late 2003 and 2004; however, it will be propelled by strong benefits and multiple buying centers.

Business Impact Areas: Significant short-to-midterm cost savings and a base for business flexibility in the midterm to the long run, especially when combined with BPA, BRE and business activity monitoring (BAM).

Selected Vendors: FileNet, Metastorm, Pegasystems and Staffware.

Analysis by Jim Sinur

4.2 Secure Web Services

Definition: Web services implementations that resist hacking or damage through computer attack

Time to Plateau/Adoption Speed: Less than two years.

Justification for Hype Cycle Position/Adoption Speed: Enterprises are beginning to realize that the trade-offs for nonstandard security in Web services reduce their potential to support dynamism.

Business Impact Areas: Increased use of Web services for business-to-business (B2B) connections and interactions.

Selected Vendors: WestGlobal.

Analysis by Whit Andrews
4.3 AMD SODA

*Definition:* AMD project approaches to SODA are appropriate for applications, services or components that require robust analysis to understand business rules and automate application design for maximum reuse and performance.

*Time to Plateau/Adoption Speed:* Less than two years.

*Justification for Hype Cycle Position/Adoption Speed:* BPA and Unified Modeling Language (UML) methodologies that are capable of capturing detailed service-oriented business models for integrated tools to automate or facilitate Enterprise JavaBeans (EJB) and C# components are still evolving.

*Business Impact Areas:* Design tools, coupled with code generators, are used to ensure compliance with business and technical models and architectures, while providing productivity and quality improvements.


*Analysis by Michael Blechar*

4.4 Legacy Modernization

*Definition:* The ability to transform an established application to a more-modern architecture or language. Issues include language understanding, business rule extraction, code slicing, and procedural-to-object wrapping or restructuring.

*Time to Plateau/Adoption Speed:* Two to five years.

*Justification for Hype Cycle Position/Adoption Speed:* Legacy modernization tooling has been developed during the past decade, but this requires a commitment to process. Promises of evolution to new architectures have exceeded delivery, except for simple-to-medium-complex applications.

*Business Impact Areas:* Leveraging established assets in new form eases technology transitions and improves economies of development.

*Selected Vendors:* IBM, CAST, Micro Focus and Relativity Technologies.

*Analysis by Dale Vecchio*

4.5 Basic Web Services

*Definition:* These are services in SOA or arbitrary software modules that use core Web services standards for defining and invoking services such as SOAP or Web Services Description Language.

*Time to Plateau/Adoption Speed:* Two to five years.

*Justification for Hype Cycle Position/Adoption Speed:* Basic Web services standards are well-defined and implemented by all leading software infrastructure vendors. The reality of Web services standards has proved to be less powerful and more difficult than promised by the media. However, tool vendors are beginning to deliver advanced productivity tools for Web services design and the Web services best practices are emerging to lead the technology out of the Trough of Disillusionment.

*Business Impact Areas:* Enables seamless interconnectivity between clients and servers over the public Internet; serves as the basis for SOA for business applications.

Analysis by Yefim Natis

5.0 Climbing the Slope

5.1 Performance Testing

Definition: Testing to determine the degradation point or breaking point of an application. Performance testing is conducted prior to deployment, as well as post-deployment.

Time to Plateau/Adoption Speed: Two to five years.

Justification for Hype Cycle Position/Adoption Speed: Enterprises have yet to realize the impact of performance testing. As more business is application-driven, consistent performance will be mandatory.

Business Impact Areas: Helps prevent the loss of business resulting from poorly performing applications.

Selected Vendors: Compuware, Empirix, Mercury Interactive, Rational Software and Segue Software.

Analysis by Theresa Lanowitz

5.2 BREs

Definition: BRE is a Gartner term that defines the rule execution space where the rules are sufficiently accessible to less-technical integrators and developers to support near-real-time business rule changes.

Time to Plateau/Adoption Speed: Less than two years.

Justification for Hype Cycle Position/Adoption Speed: Rule technology was in the Trough of Disillusionment for more than 10 years, because it significantly overpromised and underdelivered, except for specialty applications. It is now re-emerging with real benefits for a broader range of applications.

Business Impact Areas: Enables reactive policy and rule agility at the business and technical infrastructure levels in an organization.


Analysis by Jim Sinur

5.3 Mobile Development

Definition: The creation and deployment of applications on devices other than a tethered system. Used for a variety of devices.

Time to Plateau/Adoption Speed: Two to five years.

Justification for Hype Cycle Position/Adoption Speed: Development organizations must augment their established applications to include a mobile component when necessary.

Business Impact Areas: Mobile development requires business justification and a clear ROI. Without mobile applications, the business will not be truly agile.

Selected Vendors: AppForge, Borland, Covigo, MetroWerks and Microsoft.

Analysis by Theresa Lanowitz
5.4 UML Enhancements

*Definition:* De facto standard for representing object-oriented designs. Standard continues to develop to support broader range of concepts with more consistency.

_Time to Plateau/Adoption Speed:_ Five to 10 years.

*Justification for Hype Cycle Position/Adoption Speed:* Version 2 of the standard splits support, and a period of instability will delay the broad adoption of extensions.

*Business Impact Areas:* Improved specification languages close the gap between business requirements and executables.

*Selected Vendors:* Borland, Embarcadero Technologies, IBM and Telelogic.

*Analysis by James Duggan*

5.5 ARAD SODA

*Definition:* Architectural and design patterns are modified by an enterprise’s best technical architects to adhere to the organization’s architectural standards. Then, all of the code involving the architecture is generated in compliant applications.

_Time to Plateau/Adoption Speed:_ Less than two years.

*Justification for Hype Cycle Position/Adoption Speed:* Architectural standards continue to evolve, and technologies able to use these architectures to generate J2EE and .NET code are emerging.

*Business Impact Areas:* Design tools coupled with code generators ensure compliance with business and technical models and architectures, while providing productivity and quality improvements.


*Analysis by Michael Blechar*

5.6 BPA

*Definition:* BPA is a Gartner term that defines the business modeling space where business professionals and IT designers can collaborate on business process designs and architectural frameworks.

_Time to Plateau/Adoption Speed:_ Less than two years.

*Justification for Hype Cycle Position/Adoption Speed:* BPA is a business process re-engineering discipline focused more on incremental change than wholesale and radical change.

*Business Impact Areas:* Used mostly for planning purposes to guide optimal designs and targets. As systems flows show greater reach and variability, this sector will grow in use.


*Analysis by Jim Sinur*

5.7 Enterprise Software Change and Configuration Management

*Definition:* Integrated business process for software change and configuration management (SCCM) evolving to encompass the full range of change processes and governance.
Time to Plateau/Adoption Speed: Two to five years.

Justification for Hype Cycle Position/Adoption Speed: Smaller vendors are completing offerings, but user readiness will slow implementations of integrated business processes.

Business Impact Areas: Explicit processes reduce cost and risk, as well as enhance agility in response to business needs.

Selected Vendors: Computer Associates, Merant and Serena Software.

Analysis by James Duggan

6.0 Entering the Plateau

6.1 Automated Testing

Definition: Automated testing uses tools to capture and record tasks previously performed manually. Testing targeted to quality assurance, especially functional and regression testing.

Time to Plateau/Adoption Speed: Two to five years.

Justification for Hype Cycle Position/Adoption Speed: Although many enterprises insist that they test, the reality is that less than 25 percent of applications released to production have been thoroughly tested.

Business Impact Areas: Poor quality applications can lead to business failures. Catastrophic failures affect revenue and an enterprise's overall competitiveness.

Selected Vendors: Compuware, Empirix, Mercury, Rational and Segue.

Analysis by Theresa Lanowitz

6.2 J2EE

Definition: This is a Sun-sponsored architecture specification that prescribes application architecture for Java-based business applications. J2EE is implemented by multiple vendors as a J2EE application server combined with J2EE message-oriented middleware. Programming models of J2EE include Java Server Pages, Java Servlets, Session EIB and entity EJB.

Time to Plateau/Adoption Speed: Less than two years.

Justification for Hype Cycle Position/Adoption Speed: The technology risks associated with J2EE are diminishing. More importantly, skill sets among mainstream developers reach critical mass within the next two years. Challenges remain in mechanics of production deployment.

Business Impact Areas: Tools are needed to make Java feasible for conservative IS organizations.

Analysis by Mark Driver

6.3 Rapid Application Development/Agile Development

Definition: Design-driven methodology for rapid iterative development. The goal is architected, rapid, application development (RAD).

Time to Plateau/Adoption Speed: Less than two years.

Justification for Hype Cycle Position/Adoption Speed: The concepts are well-understood and proven. Combinations are being perfected, and best practices are being published.
Business Impact Areas: Improved methodologies enable teams to meet cost and time targets. Business needs can be met more accurately and quickly.

Selected Vendors: Borland, IBM and Microsoft.

Analysis by James Duggan

7.0 Conclusion

Although relatively few technologies are in the trigger phase, a logjam of usable, but imperfect, AD technologies are creating chaos for development managers. The most important changes in AD will be driven by business demands, rather than the availability of faster technology, greater bandwidth or new programming languages. In the past, enterprises took what AD organizations delivered, albeit with some complaints about software quality, low productivity, delays, high costs and project cancellations. AD organizations have survived because enterprises needed whatever the developers delivered, and were willing to accept what they got. This is no longer true. Enterprises can no longer afford to wait years for developers to build applications. However, traditional AD organizations aren't built to do things differently. During the next five years, there is no prospect of a "killer app" or some other tool that will allow the current situation to continue.
Appendix A: Hype Cycle Definitions

Technology Trigger: A breakthrough, public demonstration, product launch or other event generates significant press and industry interest.

Peak of Inflated Expectations: During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the technology is pushed to its limits. The only enterprises making money are conference organizers and magazine publishers.

Trough of Disillusionment: Because the technology does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.

Slope of Enlightenment: Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the technology’s applicability, risks and benefits. Commercial, off-the-shelf methodologies and tools ease the development process.

Plateau of Productivity: The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. The final height of the plateau varies according to whether the technology is broadly applicable or benefits only a niche market. Approximately 30 percent of the technology’s target audience has or is adopting the technology as it enters the Plateau.

Time to Plateau/Adoption Speed: The time required for the technology to reach the Plateau of Productivity.
Appendix B: Acronym Key

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AD</td>
<td>application development</td>
</tr>
<tr>
<td>AMD</td>
<td>architected, model-driven</td>
</tr>
<tr>
<td>AOSD</td>
<td>aspect-oriented software development</td>
</tr>
<tr>
<td>B2B</td>
<td>business-to-business</td>
</tr>
<tr>
<td>BAM</td>
<td>business activity monitoring</td>
</tr>
<tr>
<td>BPA</td>
<td>business process analysis</td>
</tr>
<tr>
<td>BPM</td>
<td>business process management</td>
</tr>
<tr>
<td>BRE</td>
<td>business rule engine</td>
</tr>
<tr>
<td>EJB</td>
<td>Enterprise JavaBeans</td>
</tr>
<tr>
<td>J2EE</td>
<td>Java 2 Platform, Enterprise Edition</td>
</tr>
<tr>
<td>ROI</td>
<td>return on investment</td>
</tr>
<tr>
<td>RTE</td>
<td>real-time enterprise</td>
</tr>
<tr>
<td>SCCM</td>
<td>software change and configuration management</td>
</tr>
<tr>
<td>SOA</td>
<td>service-oriented architecture</td>
</tr>
<tr>
<td>SOAP</td>
<td>Simple Object Access Protocol</td>
</tr>
<tr>
<td>SODA</td>
<td>service-oriented development of applications</td>
</tr>
<tr>
<td>UML</td>
<td>Unified Modeling Language</td>
</tr>
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</table>