



# Developing and Managing Software Applications

In a World of SOA and Web  
Innovation

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## Executive Summary

Businesses demand new and improved services to facilitate business growth and the ability to rapidly develop and deploy new products. At the same time, IT organizations face continued pressure to speed application delivery while reducing costs. As if that's not enough, technology change is happening at a rate faster than ever before, and organizations are continually challenged to assess these new technologies and adapt their software applications to leverage those that will benefit their business.

One of the most significant technology advancements has been the migration of critical business functions to the Web. Organizations are able to increase efficiency by removing impediments that separate their customers, partners and employees from their products or services. The potential advantages are clear: on-demand access to information enables customers to serve themselves without sales or customer service staff, and enterprises save millions of dollars as a result.

But the increasing reliance on web-based applications introduces significant challenges as well as unintended consequences. Application scalability becomes a major concern as application transactions become broadly available over the Web and the number of system users increases exponentially overnight. Applications must now integrate information from a host of legacy systems and new Web services, creating unparalleled management complexity. As direct customer interactions shift from business owners to IT, business managers have decreased visibility into the online experiences of their customers while IT teams find themselves directly responsible for a business channel. Ensuring transaction integrity and user satisfaction is the key to counteracting the side effects of directly exposing customers to products and services via the Web. IT must embrace their new role and collaborate with business stakeholders to optimize the customers' experience.

Another significant IT evolution has been the adoption of Web services and Service Oriented Architecture (SOA) in order to create modularity, reusability and integration among software modules. In order for IT organizations to adapt to this world of SOA and web innovation, a holistic approach to IT management is required. Enterprise IT Management (EITM) is CA's strategy for enabling a new level of management control across the enterprise by integrating and automating the management of IT applications, databases, networks, security, storage and systems across departments and disciplines to realize the full potential of each. By automating manual activities and integrating processes, CA helps organizations increase service levels, modernize legacy applications, enable IT governance as well as enforce quality standards and

application development best practices such as Information Technology Infrastructure Library (ITIL) and Capability Maturity Model integration (CMMi).

## CA Transforms IT Management

The focus of CA's EITM strategy is to manage and secure all aspects of the IT environment — from assets and users to services that the business consumes and the application environments that bring them together. By managing an integrated IT environment, organizations are able to unify and simplify their IT strategy so that it can be continually optimized in support of business needs.

CA is committed to helping customers optimize their IT environment by providing solutions that work together to enable customers to be more agile and cost efficient. CA provides a wide range of comprehensive solutions that enable IT organizations to develop, deploy and manage software applications across the enterprise such as:

- Application and service management
- Enterprise change management
- Business process management
- Application development and modernization
- Project and portfolio management

CA enables organizations to deliver and deploy business systems using proven methods and tools, and then monitor those systems with links back to the development environments so that the performance of the applications and services within those systems can be optimized. CA solutions work together to:

- Measure customer transaction success / failure rates and optimize the customer experience
- Maintain superior application performance and availability
- Predict emerging problems and implement solutions before they affect customers
- Optimize business process flows
- Implement services and applications that support those flows
- Monitor the performance of those application transactions end-to-end
- Provide a closed loop process so that required improvements are fed back into the process management and application management cycles
- Speed application delivery and reduce total cost of ownership
- Gain enterprise-wide visibility and control
- Build on existing technology investments

## Application and Services Management

CA's Wily Technology provides the only comprehensive suite of products and services specifically designed to achieve customer success through monitoring and management of end-user experiences and web infrastructure performance. These industry-leading application management solutions offer IT organizations deep insight into the whole web application environment. They also bring the customer experience back into focus for business managers who lack real-time intelligence about customer satisfaction and the health of critical business processes.

Wily's solutions provide a 360-degree view of application and service performance, ensuring both the business and IT share the information necessary for success.

**Inside to Outside.** Because of their complexity and composite nature, web applications must be managed from the inside. That is, the management technology must be able to monitor the performance of individual components within the web infrastructure and their interactions with one another at the deepest possible levels. Why? Because transaction integrity is dependent upon the flawless interaction of hundreds of components and back-end systems. Only by knowing the performance at the deepest level can you be certain the higher levels—the business process, the shopping cart and entire transaction flows are working properly.

**Outside to Inside.** The ability of end users to successfully initiate and complete transactions is the ultimate measure of success for web applications. It is essential that businesses understand the customer experience so they don't get blind-sided by end-user complaints or worse, reduced revenues resulting from poor application performance. Organizations need to be instantly alerted of threats to customer satisfaction, service-level compliance and expected revenue.

**End to End.** To manage composite applications, IT teams must have the ability to monitor and trace real transactions from the browser (end user) to the back-end systems where data is located. But to be truly effective, this end-to-end visibility must be internal—from the application's point of view—so that problems can be accurately and quickly identified. Siloed systems management tools will fail to share this data as transactions traverse the information supply chain.

**Top to Bottom.** Whether your application platform is heterogeneous or provided by a single vendor, it's essential that the management solution provide real-time visibility across the entire stack—server, operating system, JVM, portal server, integration middleware, application server, application code, and database—in a single tool, regardless of the operating system.

**IT to Business.** Organizations that deploy business-critical web applications must ensure effective communication between IT groups and business units—especially when it comes to the performance of these applications. The management solution needs to provide a shared mechanism for measuring application availability, performance trends and customer success.

CA's Wily Technology solutions provide real-time views and proactive alerts that enable organizations to immediately respond to the online experience of each application end user, detect transaction problems as they happen and ensure transaction integrity. Every transaction is monitored in real time — analyzing the performance and quality of web-enabled business processes. When problems with real or synthetic transactions occur, detailed analysis is provided on the scope, severity and business impact of the transaction defects. Cost, resource utilization and configuration information are automatically gathered — providing essential evidence to rapidly solve problems and align IT actions with business priorities.

IT teams are able to monitor complex web applications in production environments continuously to detect and resolve problems before they affect customers. Unique and proven management capabilities allow organizations to restore business operations and deliver superior quality of service. Patented, low-overhead technology is used to manage mission-critical applications end-to-end — from browser to application components to back-end systems — around the clock without degrading performance.

## Enterprise Change Management

Integrated processes, automation and best practices enable change to be managed within and across both operations and software development domains. This supports discrete requirements, and by coordinating interrelated activities increases efficiencies and lowers risk. CA's integration enables a true Enterprise Change Management (ECM) solution, managing all change types, including strategic and day-to-day activities. ECM provides a single point of entry for all changes, and helps you control and optimize change — from prioritization to deployment, accelerating delivery while validating that the change met the original objective.

CA's ECM solution leverages integrated processes and workflows to provide the following important benefits:

- Facilitate the rapid deployment of change, while preventing problems due to poor communication, manual handoffs and a failure to understand how a change in one area will impact another.
- Enable organizations to plan, categorize, prioritize and manage both tactical and strategic change, helping businesses analyze the cost associated with making changes to the portfolio and compare its strategic value to the business.
- Provide the organization with a single point of entry for all change requests, with consistent and repeatable processes in place to lower costs and improve efficiencies.
- Support auditing and compliance-based initiatives (such as Sarbanes Oxley) by maintaining a complete record of changes from initial request to deployment.
- Mitigate risk, and prevent unauthorized changes by automating approval procedures and processes.
- Help organizations increase service levels and enforce quality-based standards, application development methodologies and best practices such as ITIL, CobiT and CMMi.

Without this capability it would be impossible to unify and automate change within and across organizational boundaries, and to manage both strategic and tactical change. With an integrated Enterprise Change Management capability that leverages workflow and integrates processes, your organization can rapidly plan, prioritize and deploy changes while minimizing risk.

- The CIO can support changing business requirements without disrupting existing business services, ensuring that the investment is aligned with the priorities of the business.
- Compliance auditors have a single source for all change activities, and gain better visibility into auditable records of all system and application changes.
- The VP of application development can now show reduced costs and increased ROI as a result of automating an end-to-end change management process.
- The service desk manager improves customer satisfaction by preventing unauthorized changes, thus reducing the number of incidents and problems.
- Software developers can focus on more purposeful activities, since time consuming manual processes are automated.

## Business Process Management

While the complexities and volatility of today's competitive business environment are forcing organizations to become increasingly more agile, bottom line pressures mandate minimizing business risk. Balancing agility and profitability requires a seamless alignment between IT and business. CA provides Business Process Management (BPM) solutions that enable organizations to accomplish this by providing understanding, automation and optimization of IT and business process policies — leveraging the knowledge and involvement of business users, as well as IT experts in the definition and management of these processes and policies.

CA BPM solutions enable companies to continuously align their IT applications to changing business realities by externalizing processes and policies, monitoring the pulse of business operations in real time and integrating disparate silos of applications and information. This enables organizations to:

- Deliver higher quality, agile systems at a lower cost
- Gain competitive advantage by decreasing time-to-market and optimizing process performance
- Ensure common vocabulary across the organization
- Model processes to reflect human and system interactions and integrations
- Reuse business rules for components and services
- Reconcile processes and business rules
- Easily integrate with value chains / partners
- Align IT strategies with business objectives

### BPM, SOA and Modeling

Web services and SOA employ technologies and repeatable methods to design and build applications as an assembly of accessible business level services. This can be thought of as adding a services tier or layer between the IT infrastructure and the business processes it supports. We can see from other industries that as the industry matures, additional levels of abstraction from the base product are often created. Consider the history of food production and manufacturing, for example. Food production historically was a two tier sales model — those who grew crops and those who produced meats sold directly to consumers. Today, we have networks of providers in the “service tier” where foods are purchased from the original producers and turned into TV dinners, sold in supermarkets along with other products and services. This “service” tier was created to deliver increased value to the end customer and was enabled by technological advances in food processing and distribution. This is a trend we see most industries following as they become more customer-focused and

aligned over time. Much of the same transition is taking place in the IT industry today. Within IT, the initial focus has been on efficiency — standardizing and consolidating assets, and applying automation and repeatability. As the infrastructure component becomes more efficient, we are now seeing the drive toward business alignment and convenience for the end user of IT. This is addressed by the new service tier within IT.

To maximize the return on investment of application development, business units and IT organizations must move their vision beyond single applications and look toward the higher level business processes. Instead of focusing on developing single applications, organizations need to consider the entire set of services that, taken together as a process sequence, represents a higher level business process flow.

CA provides solutions and services to help organizations “evolve” toward service orientation in a phased approach, with tools that enable the development and management of services, as well as the ability to incorporate them into process flows. Model-driven application development can help organizations better understand their business processes and help close the gap between lines of business and IT. Implementing SOA, using a model-driven approach, can usher in a new way of thinking about building and maintaining ROI within business applications. Integrating services with automated workflows provides a higher level view of BPM across multiple applications. The combination of SOA, BPM and model-driven development evolves application delivery to a new level.

## Application Development and Modernization

Applications that support business processes must be delivered on time and must meet the needs of the business. These applications must be easily adaptable and maintainable as requests for system changes will occur. In addition, compliance and regulatory requirements, such as Sarbanes-Oxley, demand that IT provides a complete audit trail of these changes. IT development organizations are challenged to meet these requirements without comprising the quality and performance of these systems, while at the same time reducing the costs of developing software and meeting implementation deadlines.

In order to survive in this demanding and fast-paced IT world, many enterprise organizations are moving away from a build from scratch mentality toward an assembly and reuse approach to application delivery, and looking to the power of SOA to drive business results. Model-driven development helps organizations meet these business and IT requirements – business processes are documented and

stored in a model. From this model, business processes can be generated on various technology platforms. Changes are recorded and can be used for audit purposes afterwards.

### Model-Driven Development

Model-driven development uses modeling to visualize and manage the architecting and development of business applications. The purpose is to extract the complexity of the business into a set of predefined diagrams that enable organizations to separate business processes from technology implementation. Many organizations have realized that modeling is one of the most critical first steps to SOA success. Business models include diagrams that illustrate the major components of a system such as data requirements, business rules, user interfaces and process flows. With an integrated model-driven environment, the modeling objects which comprise these diagrams are stored in a central repository, where they can be shared with an entire team throughout the development process. Robust security protects the integrity of the model objects, enabling parallel team development and reuse. When changes to the system are needed, instead of sifting through and modifying a bunch of system code, changes are made directly in the model. And because it’s an integrated modeling environment, this means when an object is changed, it is reflected throughout the entire model. This significantly speeds development and maintenance of applications and services, and enables organizations to react much quicker to business change.

### Platform Independent Development

Model-driven development enables developers to build and design applications independent of the deployment environment. From a single model, systems can be deployed to the platform, database, middleware and language of choice. This provides organizations with a flexible development and modernization approach that enables migration to multiple platforms now and in the future. Many organizations do not know what platforms they are going to target five years from now. CA enables organizations to develop or modernize to J2EE, .NET, UNIX, Linux or the Mainframe. Model-driven development, combined with automated code generation, enables organizations to transition to different platforms from a single model without rewriting any code. This significantly reduces the cost and risk of platform migration.

## Technology Insulation

Over the last two decades, application development technologies have changed from 3270 green screen and batch architectures, to distributed client/server computing, to web and wireless infrastructures, J2EE, .NET and now Web services and Service Oriented Architectures. The rate of this technology change has accelerated considerably over the last decade with no signs of slowing down. An organization's ability to adopt new technology and leverage it to achieve competitive advantage is a key to survival in today's fast-paced markets. Model-driven development, combined with 100% code generation, enables organizations to develop systems that leverage the most current technologies without having to understand all of their underlying details. Organizations can regenerate their models to incorporate new technologies without having to spend the time and money to completely rewrite their systems.

## Legacy Application Modernization

As enterprises evolve, so do their applications. A key discipline for IT organizations is ongoing assessment of their application portfolio. Options for evolving an application portfolio include leaving the application as it is, integrating it, migrating the application to new technology or eliminating the application altogether. Balancing the choices is not easy, and many factors need to be considered to determine what is best for your organization. Applications that provide value to the business but are costly to run, too complex to maintain or can't be integrated with other systems are good candidates for legacy modernization.

A legacy application may be defined as any production enabled software application, regardless of the platform it runs on, language it is written in or length of time it has been in production. Legacy applications contain the business rules and data that comprise the intellectual property required to run the business. Legacy modernization is about retaining and extending the value of legacy applications, reusing the intellectual property buried in these systems and combining that with the opportunities that present and future technologies offer.

CA provides a highly automated solution that converts legacy code to modern platforms and architectures such as J2EE, .NET, Web services and SOA. Using automated extraction and documentation technology, combined with a model-driven development approach, CA enables organization to significantly reduce the time, cost and risk of modernizing legacy applications. Many enterprise organizations rely on their mainframe as a very strategic part of their IT infrastructure. CA is committed to helping customers extend the value of their mainframe systems, taking full advantage of the optimum performance and

reliability their businesses depend on. CA enables organizations to modernize their mainframe so that it may co-exist with new technologies and platforms.

Business processes are an organization's mechanism for creating and delivering value to its stakeholders. The ability to extract business processes from legacy systems, document them within a model-driven environment and then forward engineer them into modernized applications assists organizations in meeting process compliancy requirements associated with legislated standards such as Sarbanes-Oxley and HIPAA in the U.S. and BASIL2 in Europe. Combining model-driven development, SOA and BPM during application modernization will help reduce, and eventually eliminate, the next generation of legacy applications. Within an SOA, entire applications will no longer require modernization. Applications can be redesigned, replatformed, redistributed and integrated by modifying the individual services that comprise the application.

## Project and Portfolio Management

Badly executed development projects are expensive in terms of money, credibility and employee morale. CA's project management solutions provide enterprise program and project planning, estimating, budgeting, resource allocation, collaboration and time capture to help you deliver applications efficiently and flawlessly. CA's best practices, templates and methodologies decrease project initiation time, increase project success rates and leverage your staff's expertise.

CA's portfolio management solutions insure you make the right application investment decisions. You can align investments with corporate goals in a single, integrated system with the ability to assess the entire portfolio of applications and associated systems, projects and physical assets. Unlimited "what-if" scenarios make it easy to model the best alternatives, and real-time investment status makes it easy to course correct if problems arise. Using portfolio management, you'll avoid missed business opportunities, and help speed time-to-market by automating the capture, evaluation and approval of new application ideas. The ability to establish sophisticated evaluation and selection criteria, create and optimize planning scenarios, communicate decisions, monitor progress and manage new ideas in a seamless, integrated system will give you unprecedented control over your applications, resources and commitments.

## CA Integration Platform

An Integration Platform enables CA solutions to support the discrete IT management needs across operations and software development, and employs workflow and integrated processes to ensure that changes are rapidly implemented with the lowest possible impact on business service quality. The CA Integration Platform consists of a set of shared services, namely:

- a consistent user experience
- integrated data, enabled by a centralized management database (MDB)
- integrated processes and workflows
- common policy

Detailed information about assets (including configuration, financial and usage data) is collected and stored in a central MDB that is part of the CA Integration Platform. This MDB provides a single comprehensive view of all information concerning your IT assets. CA products can automatically convert this raw asset data into actionable intelligence so IT executives can quickly and easily make informed business decisions about their IT assets. To support this, CA provides an executive-level portal, a view into IT asset Key Performance Indicators, enabling IT managers to identify opportunities for increased efficiencies and cost savings.

The CA Integration Platform enables a common definition of assets across management systems to support a system of checks and balances. This enables a critical element missing from many systems today — the ability to automatically reconcile discovered assets, for example, from a network management system, against the number of assets being managed and the number of assets actually owned. But only when these systems are tightly integrated and share the same definition of an asset can you be confident that you are comparing apples to apples. Only when these systems share a common asset definition can you know with confidence that discrepancies between these systems are highlighting a problem that should be investigated. This way, you can ensure that you own all of the assets in your environment and identify whether any assets you own are unaccounted for.

CA's Integration Platform enables our customers to derive more value by automating the delivery and activation of management policies on discovered assets. Once an asset is inventoried, CA's solutions store asset data in the MDB and, depending on the classification of the asset, will install the appropriate management policy.

## Summary

CA provides the tools to help organizations adapt to a World of Services and Web Innovation. By providing a mechanism for capturing and prioritizing business demands, CA solutions deliver critical insight and control of the assets, processes, people and projects supporting those services. By automating manual activities and integrating processes, CA helps organizations increase service levels, modernize legacy applications, enable IT governance and enforce quality standards and application development best practices such as ITIL and CMMi.

Together with Wily Technologies, CA offers customers unparalleled end-to-end visibility into their IT environments from applications to infrastructures to better manage critical technologies and boost overall business performance.

**For more information about CA solutions that will enable you to manage risk, improve service, manage costs and align your IT investments with your business needs, come see us during Gartner AD Summit 2006 at Booth #4 or visit [ca.com/events/adsummit](http://ca.com/events/adsummit)**

