



## The Road to Higher Development Efficiency

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# Executive Summary

The drive to produce higher quality software in less time is not new. For as long as software has played a significant role in business operations, teams have sought the tools and processes that will help them deliver software better, stronger, faster (and more cheaply). Development organizations, whether producing software products for sale or building/extending internal applications, are continually seeking to optimize their effectiveness. What has changed over time, however, are the external factors that present “bumps” in the road to development efficiency. This paper outlines some of these external factors, as well as some of the best practices that high-performing development teams are using to overcome these challenges.

At this juncture, there are three key external drivers impacting development efficiency.

The first is simply organizational change. Whether due to the downsizing/rightsizing that followed the recent economic downturn, or the current trend of mega-mergers and consolidation, an organization will likely be comprised of disparate tools and disconnected organizational structures. This will lead to a chaotic development environment faced with little control, security and visibility.

The second key challenge described is government regulations. The most topical of these, at least in the United States, is the Sarbanes-Oxley Act. Most organizations are feeling the impact of compliance efforts, and those who are already compliant are often operating with new, manual processes that hinder effective operations.

And finally, a key trend that is impacting the efficient operations of a development team is distributed development. Whether distributed across buildings, cities, or continents, geographically-distributed development organizations are the norm. And this structure presents serious challenges to effective communication and collaboration.

Read on to discover how teams are addressing these issues by facilitating visibility into development projects and assets for core teams and executive stakeholders alike, and by enabling collaborative development practices supported by SourceForge® Enterprise Edition.

# The Road to Higher Development Efficiency

## The Road Ahead

The face of business has changed. Gone are the days when software development was performed by small, focused groups working in a single location. Today's highly competitive business environment now places intense demands on IT and R&D managers to deliver higher quality software in less time. But accomplishing this in the context of rapidly changing business goals, mergers & acquisitions, fixed resource constraints, stringent new regulatory requirements, and the growing use of geographically-distributed teams is a tough challenge.

Whether developing software products for sale or building/extending internal business applications, enterprises are now more than ever acknowledging the contribution that software development makes to business success. The ability to get a product offering, or a Web-site, or a CRM application "to market" faster is a competitive advantage. With this visibility comes increased pressure to maximize the efficiency of development – do more, faster, for less. At the same time, there are a number of external trends that can hamper, or present a "bump" in the road to development efficiency. This paper will examine a few of these trends, and outline some of the best practices for maximizing development efficiency.

### *Sharp Turn Ahead: The Aftermath of Organizational Change*

Multiple tools and technologies in use. Dozens of disconnected, undocumented processes. Legacy systems and processes whose source (and real value) is unknown. These are the legacies of organizational change. Whether the change results from mergers and acquisitions, rapid growth, or simply a change in CIO/CTO leadership, chaos is often the result for development teams. While this chaos has many symptoms, including inefficiencies, cost overruns, and low morale, there are two key sources of those symptoms that truly have an impact on the efficiency of development teams:

- Infrastructure issues such as disparate, heterogeneous tools and systems make it difficult to connect teams, processes and technology
- Lack of visibility into projects and IT investments for managers and executives make it difficult to keep projects on track and inhibits the critical "buy-in" needed from business stakeholders

Consolidation has been the theme of many industries in the past two years, not the least of which were the technology and telecommunication sectors. Mega-mergers and buyouts have consistently populated the headlines of business publications. Mergers and acquisitions create a wide array of challenges (and opportunities) for IT and R&D organizations. Key challenges resulting from mergers include:

- Geographic and organizational barriers hinder trust and collaboration

- Companies frequently enter into M&A activity without a centralized development platform for managing their own work, making integration and collaboration with new teams more time-consuming and expensive
- Avoiding duplicative (and expensive) development efforts due to lack of a centralized and searchable intellectual property (IP) asset management system

Current business news indicates that these issues will continue to be a problem as consolidation continues to be a trend in 2005 and beyond.

### *Slow Traffic: The Impact of Government Regulations*

The cost of doing business just went up. The effects of the Sarbanes-Oxley Act continue to ripple throughout corporate America with Section 404 of the Act mandating that adequate "internal controls" exist to ensure compliance. CEO's must certify their financial results. Shareholders are demanding accountability. And the SEC now has the tools and resources at their disposal to police compliance issues. IT activities, especially those that relate to financial systems, must now be fully traceable and auditable. However, disparate tools and systems make compliance difficult, especially following mergers and acquisitions and with the increasing use of outsourcing service providers. Some of the key challenges introduced by regulatory requirements include:

- Disparate, heterogeneous tools, systems and processes hinder compliance efforts and make it difficult to achieve full traceability for compliance audits
- Poor visibility into remote activities impedes compliance monitoring
- The use of outsource service providers can delay and/or obstruct compliance efforts

The impact of non-compliance ranges from fines to jail terms, and includes the harsh reality that failure to comply will ultimately impact the organization's public image and share price. As a CIO, VP of Development, IT Director, Application Development Manager, or IT Architect you must ensure that your organization has the necessary processes in place before the auditors arrive and after they leave. Achieving and maintaining Sarbanes-Oxley (SOX) compliance is a major challenge for any organization. Under SOX, financially-charged audit activities extend beyond the financial group to all areas of the organization. Ideally, SOX procedures allow everyone to prove that they have executed their jobs properly and ethically while following well-defined internal controls. But SOX compliance can become a defocusing exercise that can distract employees from their core job functions. Even after the audit or milestone is reached, many organizations find themselves with formal processes that actually inhibit their efficiency.

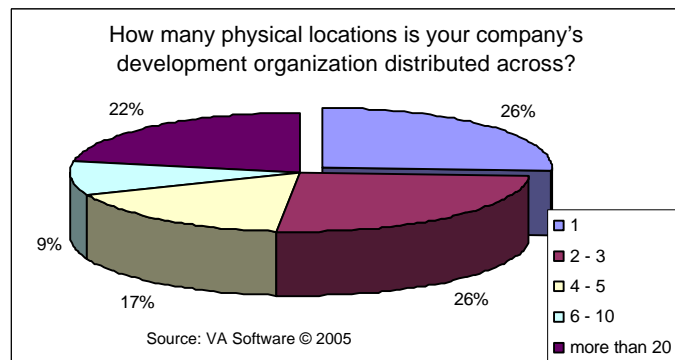
One example of this effect comes from a large financial services company. This organization met SOX requirements, tracking activities via emails and spreadsheets. Individual developers had to document activities and send status via email, and the manager then collected and rolled this data into status reports on a weekly basis. This process required an average of two hours per week for

each developer, and an average of eight hours per week for managers, depending upon the size and scope of the projects. Thus, these seemingly insignificant tracking tasks added up to significant costs by keeping developers and managers from the critical development tasks at hand.

### *Fork in the Road: Distributed Development Adds New Complexities*

Enterprises today are employing multiple development teams on a global scale, and the ability to manage, share data and collaborate amongst those teams has become a critical component of the software development life cycle. A recent VA Software survey<sup>1</sup> of 176 IT and development engineers, managers, and executives revealed that 74% of firms have more than one development location.

Many had a large number of locations: 48% have four or more and 26% have more than twenty locations. By comparison, a May 2002 survey conducted by IDC for VA Software found that only 62% of organizations had more than one development location. And this phenomenon is not limited to very large, global enterprises or to independent software vendors (ISVs). Survey results were fairly consistent across a variety of respondent types, including both IT development (56%) and R&D (44%) organizations, and across a variety of enterprise sizes, including small groups (<49, 53%), medium groups (50-499, 26%) and large development organizations (>500, 21%).



The notion of distributed development includes organizations that are spread across multiple buildings, multiple cities, or multiple continents. These organizations often include single projects spanning multiple locations. For example, one large Web security services provider has more than 176 development professionals working together on projects – these professionals are located across three sites, and include development, usability, QA, and documentation functions. In other organizations, specific functional groups, such as QA or documentation,

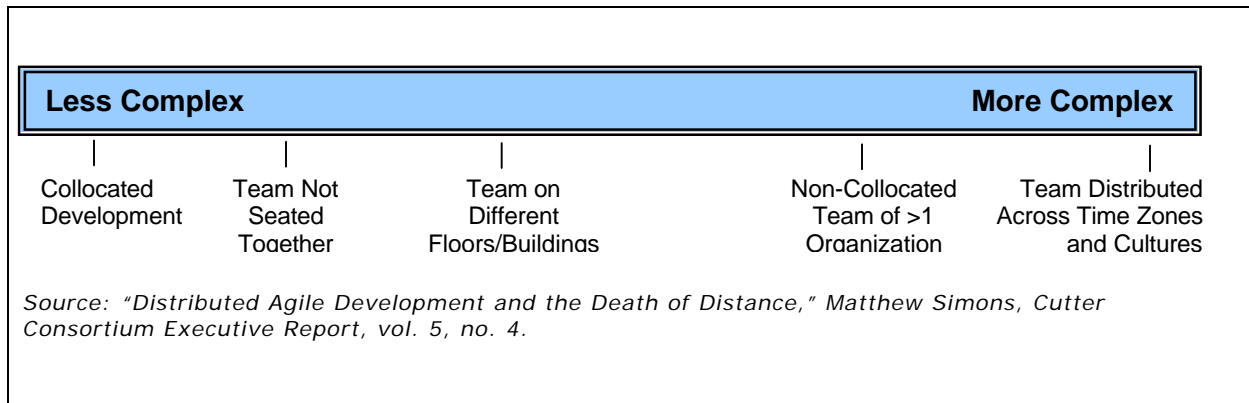
*"The knowledge that is captured in email discussions or threaded discussions external to requirements management systems, defect tracking systems, and code management systems is easily lost, or at the least remains difficult to locate or even inaccessible to some portion of the team, even when the team is all together in one physical location. The problem grows exponentially as teams are distributed across multiple sites, time zones, cultures, and even organizations."*

- Melissa Webster, "An End-User View of the Collaborative Software Development Market," IDC, #30608, December 2003.

<sup>1</sup> "Application Development and Open Source Process Trends Survey Report," VA Software, October 2004.

work in a centralized fashion, serving many projects from a central location. Still others employ outsourced providers to deliver a specific element of the product lifecycle, whether QA or maintenance.

Collocated teams certainly experience their share of efficiency challenges, but these challenges increase exponentially as teams become more complex – in the model below, adapted by the Cutter Consortium<sup>2</sup>, a collocated (single organization) team is the least complex, and a distributed, multi-organization team is the most complex.



With this increased complexity typically comes a longer development cycle and higher costs, but there are also some unique impacts to the development organization:

- Poor visibility and control of remote activity (including planning, tracking, and reporting)
- Inadequate communication, collaboration and coordination across individuals, teams, time-zones and projects
- Insufficient (or lacking) knowledge and asset management capabilities

Again, while these challenges may affect distributed teams of any type, whether they are solely internal teams, or a mix of in-house, outsourced, and offshore teams, the more complex teams may suffer these challenges to a greater degree. Add to this mix the pressures of looming compliance deadlines and the issue of coordination and asset management across complex teams becomes an urgent concern.

## Roadmap: Getting From Here to There

All of these trends – organizational change, regulatory requirements, and distributed development – are likely to continue to drive inefficiencies in software

<sup>2</sup> "Distributed Agile Development and the Death of Distance," Matthew Simons, Cutter Consortium Executive Report Vol. 5, No. 4 (adapted from Managing the Flow of Technology, Thomas J. Allen).

development organizations for some time to come. Some common contributors to inefficiency hold true across all of these trends:

- ✓ Disparate, heterogeneous tool and process environments
- ✓ Lack of visibility into progress, assets, or projects
- ✓ Lack of communication or coordination

How are high-performing development organizations addressing these challenges and improving efficiency?

### *Headlights Required: The Importance of Visibility*

IT, like R&D, has emerged from being a cost center to being a critical driver of profitability and competitive advantage. With this role comes added scrutiny from executive leadership and from line-of-business stakeholders – stakeholders who need up to date status data and assurance that investments in software development are providing a return to the business. CIO.com's "State of the CIO 2004" survey of 544 IT leaders asked which were the five biggest hurdles or barriers to their effectiveness. The top five ranked responses were:

1. Unrealistic or unknown expectations from the business
2. Inadequate budgets
3. Shortage of time for strategic thinking/planning
4. Difficulty proving the value of IT
5. Lack of alignment between business goals and IT efforts

While budgetary constraints are hardly new, it is notable that three of those top five responses are related to a lack of visibility – visibility for IT leaders into expectations from others and providing adequate visibility into IT for business leaders to understand the value being delivered.

Visibility is also a requirement, as noted above, for government regulatory compliance (Sarbanes-Oxley, HIPAA) as well as process standards that many development organizations must pursue to win new business (CMMI, ISO, etc.).

Delivering this visibility is more than simply establishing a project Web page or starting a tracking spreadsheet. There are a number of common inhibitors to visibility. When status is gathered manually via email or meetings, reports will be out of date and filled with subjective assessments. And when teams are distributed or when data is collected in multiple repositories, file systems, or Web pages, surfacing the right material at the right time is a challenge.

To overcome these inhibitors, development organizations are making processes more transparent. Best practices for providing this visibility include:

- **Capture and preserve histories:** log and archive who created, reviewed, and approved each artifact or activity, and when

- **Drive more objective reporting:** Leverage automated reporting capabilities from development tools
- **Define processes and permissions:** following a defined process and carefully documenting and enforcing permissions to access project assets is essential to meet government regulations and quality standards
- **Comprehensive, cross-project search:** having the above is irrelevant if the right artifact or the right record cannot be found when needed

## *Merging Traffic Ahead: Collaborative Development Practices*

The rapid pace of development and innovation in the Open Source community has proven that new methods and key enabling technologies can overcome many distributed development barriers and deliver higher quality applications in less time. Within the enterprise, managers are faced with many of the same pressures, including asset use efficiency, and maintaining oversight and prioritization of projects. In a recent survey of 176 IT and development professionals, including engineers, managers, directors and executives conducted by VA Software, 87% said they used Open Source tools, technologies and techniques. More than half of the respondents (52%) felt that this improved software quality, 43% said it increased overall productivity and efficiency, and 35% said it lowered costs.<sup>3</sup>

As enterprise project teams increasingly become virtual, development challenges mirror those overcome by the Open Source community. The Open Source development model is a very fluid, collaborative and agile process. By using collaborative development processes and centralized tools for managing projects, issues, communication and code, the Open Source development model allows virtual teams to improve project efficiency and produce high quality results.

*“How is it that large groups of totally independent programmers can develop high-quality code that really meets users’ needs? And most importantly, what can AD organizations learn from these best practices? To remain competitive, AD organizations must adopt some proven open source processes and blend them with internal techniques. Project managers must adopt good multisite management processes and emphasize collaboration and transparency across each team’s deliverables.”*

*- Liz Barnett, “Trends 2005: App Dev Processes and Methodologies,” Forrester Research, November 4, 2004.*

One of the key enabling technologies behind the success of Open Source projects is SourceForge.net, the world’s largest Open Source software development web site. The SourceForge.net site is powered by SourceForge collaborative software development tools from VA Software. The SourceForge software platform has allowed SourceForge.net to provide a scalable solution for empowering development teams across the diverse worldwide Open Source community. SourceForge.net provides a centralized system with integrated tools for

<sup>3</sup> “Application Development and Open Source Process Trends Survey Report,” VA Software, October 2004.

managing and accelerating development projects, and currently hosts almost 1 million registered users participating in more than 93,000 projects.

## Destination: More Efficient Development

As software becomes a more important contributor to enterprise success, the importance of software development efficiency, transparency, and agility have become more critical than ever before. SourceForge® Enterprise Edition, a collaborative development solution from VA Software specifically architected for enterprise development, provides comprehensive solution to many of these challenges, enabling improved collaboration and increased visibility and control over distributed development.

Again, this paper has highlighted three key trends influencing (or challenging) the efficiency of development organizations:

- Organizational change/restructuring
- Regulatory requirements
- Distributed development

Next, we outlined two of the best practices that organizations are employing to overcome these hurdles:

- ✓ Providing visibility/transparency into (and within) development processes, projects, and artifacts
- ✓ Developing and supporting collaborative development practices

Identifying a best practice is one thing – implementing it is quite another. SourceForge Enterprise Edition helps organizations enable these best practices by automating key processes and centralizing the tools and resources required to realize the promise of improved development efficiency.

### *Visibility*

SourceForge Enterprise Edition flexibly connects tools and processes with a centralized, secure collaborative development environment to foster better communication and coordination. This eliminates information silos and provides the visibility into project assets that both core and extended teams need.

Centralizing all development-related data and capturing and storing asset histories also provides the traceability and auditability needed to support compliance with regulatory requirements and process standards such as Sarbanes-Oxley, CMM, HPIAA and others. At the same time, the SourceForge dashboard and reporting capabilities provide managers and other stakeholders with centralized, real-time status rollups and color-coded indicators of projects and related issues — regardless of location.

Centralized data has little value, particularly to a distributed organization, if it is not readily accessible and secure. SourceForge provides a role-based access control model that allows you to define permissions to specific projects or specific assets, as desired. This provides both the visibility that extended stakeholders require, as well as secure control over access to project assets for distributed teams, partners, or contractors.

At the same time, a cross-project search capability allows you to search for any string of characters or binary code across documents, source code, discussions, and activities. SourceForge also provides ability to “associate” SourceForge objects through a simple link, so you can quickly reach the information you need and review relevant items associated with that object (including associated tasks, documents, discussions, etc.).

### *Collaborative Development*

Inspired by the collaborative practices of the global Open Source community of SourceForge.net, SourceForge Enterprise Edition provides Web-accessible collaboration features, integrated within the development environment. Unlike stand-alone collaboration tools, distributed teams leverage SourceForge to communicate efficiently within the context of the development objects (such as a development activity or artifact). This ensures that valuable information and decisions are captured, stored, and traced.

SourceForge helps stakeholders, managers and development teams stay constantly informed and engaged via integrated discussion forums, mailing lists, and document management, plus share views into development artifacts and tools. Automated notifications inform team members and stakeholders of changes as they occur, improving efficiency, communication and coordination.

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Today, VA Software is playing a central role in helping companies optimize distributed development. SourceForge Enterprise is currently at work in Fortune 1000 companies and government agencies spanning industries including aerospace, communications, defense, financial services, manufacturing, and pharmaceutical. VA Software has helped these enterprises enable an iterative, rapid development approach, allowing teams to merge ideas and efforts in a collaborative, on-going process. The enabling technology is a collaborative development environment that integrates existing tools to provide managers, developers and other stakeholders with real-time visibility and control of distributed development activity while improving overall efficiency – regardless of location.

## For more information

To learn more about how VA Software and SourceForge Enterprise Edition can help successfully manage geographically distributed development, visit [www.vasoftware.com](http://www.vasoftware.com) or contact VA Software at 1-877-825-4689.

## About VA Software

VA Software (NASDAQ: LNUX) is at the center of today's technology revolution and incites innovation by empowering the IT and developer communities with information, community support and software. VA Software is the parent company of OSTG (Open Source Technology Group), and the creator of SourceForge. SourceForge.net is the global nexus for the Open Source community with more than 90,000 Open Source projects and over 900,000 registered users. SourceForge Enterprise Edition is an enterprise-grade version of SourceForge for optimizing and managing distributed development across the enterprise.

Additional Resources available at [www.vasoftware.com](http://www.vasoftware.com):

1. "Application Development and Open Source Trends" Survey Results Report
2. "Leveraging Open Source Processes and Techniques in the Enterprise"
3. "Technical Overview: SourceForge Global Development Platform"
4. "Keeping Offshore Development On Track"

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