

S O F T W A R E
D E L I V E R Y
O P T I M I Z A T I O N

MAXIMIZING THE BUSINESS VALUE OF SOFTWARE

A Borland Vision and Solution Strategy Paper

THE TRANSFORMATION OF SOFTWARE DEVELOPMENT INTO AN ACCELERATED
YET DISCIPLINED APPROACH THAT ALIGNS PEOPLE, PROCESS AND
TECHNOLOGY TO MAXIMIZE THE BUSINESS VALUE OF SOFTWARE

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Abstract

TAKE A HARD LOOK AND ASK YOURSELF: IS YOUR IT ORGANIZATION AS FOCUSED AND RESPONSIVE TO BUSINESS NEEDS AS IT CAN BE? IS SOFTWARE REWORK OVERSHADOWING YOUR INITIAL INVESTMENTS? IS YOUR LEVEL OF PROJECT SUCCESS REPEATABLE? IS IT POSSIBLE TO RELIABLY PREDICT THE OUTCOME OF YOUR SOFTWARE DELIVERY?

STATISTICS OVER THE PAST DECADE CONTINUE TO SHOW AN ALARMING NUMBER OF PROJECT CANCELLATIONS AND FAILURES. THE STAKES ARE HIGHER THAN EVER AMIDST A BACKDROP OF INCREASED INDUSTRY REGULATION. COST-SAVING INITIATIVES AROUND OFF SHORING AND OUTSOURCING HAVE NOW SHIFTED FOCUS TO RISK MITIGATION. BUSINESS APPLICATIONS NOW PRESENT AN UNPRECEDENTED LEVEL OF COMPLEXITY AND CHALLENGES AS THEY TARGET LARGER AND MORE DIVERSE USER-BASES ACROSS MULTIPLE DELIVERY CHANNELS.

THE LACK OF INFORMATION AND PROCESS LEADING TO THE BUSINESS' INABILITY TO SELECT SOFTWARE INITIATIVES THAT REAP THE BEST ROI, ONLY SERVE TO WEAKEN THE ABILITY OF EVEN THE MOST EFFECTIVE SOFTWARE DEVELOPMENT ORGANIZATION, TO EFFICIENTLY MANAGE THE TRADE-OFFS RELATIVE TO THE CONSTRAINTS OF TIME, BUDGET, QUALITY AND SCOPE IN DYNAMIC, CHANGE-SENSITIVE AND DISTRIBUTED BUSINESS ENVIRONMENTS. IT ORGANIZATIONS RIGHTLY OR WRONGLY ARE LOSING GROUND AND CREDIBILITY, UNABLE TO SET THE RIGHT BUSINESS EXPECTATIONS AND EXECUTE EFFICIENTLY AND PREDICTABLY.

THE GREATER IMPACT CAN BE MEASURED IN THE LOSS OF BUSINESS OPPORTUNITIES, WITH THE INABILITY TO BE RESPONSIVE TO MARKET OPPORTUNITIES, CHANGING CUSTOMER DEMANDS, OR COMPETITIVE THREATS.

THIS PAPER EXPLORES THE FACTORS BEHIND THE ROADBLOCKS HINDERING SOFTWARE SUCCESS, AND DEFINES A PATH TO ENABLE THE SOFTWARE DEVELOPMENT ORGANIZATION TO BECOME AN EQUAL PARTICIPANT IN SHAPING OVERALL ENTERPRISE IT INITIATIVES.

CALLING FOR AN EVOLUTIONARY YET SIGNIFICANT SHIFT IN THE WAY THAT SOFTWARE IS CONCEIVED, DESIGNED, BUILT AND DELIVERED, BORLAND INTRODUCES ITS VISION AND SOLUTION STRATEGY TO TRANSFORM SOFTWARE DEVELOPMENT FROM AN UNPREDICTABLE ART FORM INTO A MANAGED BUSINESS PROCESS.

The Enabler of New Business Value

The software development organization today is at the center of attention and rightfully so. It has become the critical facilitator and enabler of sustainable competitive business advantage.

Across the board, businesses are struggling to squeeze more value from their IT investments. The increased focus on software development to drive business value, can come as no surprise. According to McKinsey, Morgan Stanley and CSFB, the lion share of IT software budgets is targeted at creating value via new software development. The research indicates that customization, which includes legacy modernization and integration projects, receive around 57% of software budgets, with only 11% invested in “generic” packaged applications.

As the statistics help reveal, packaged applications represent what it takes for most organizations to “get in the game,” with further innovation required to sustain competitive market positions. To establish new value and seize new opportunities, efforts are increasingly focused on ensuring business flexibility and responsiveness. The trend towards service-enabling legacy application investments with the adoption of Service Oriented Architectures (SOA) for example, which includes integrating, extending and customizing enterprise systems through composite applications, is replacing the monolithic approaches of the past.

A natural shift that analyst firm Forrester describes as “essential business complexity,”¹ these initiatives fuel differentiation and drive competitive advantage through specialized software development, tailored to meet the specific needs of the business. In an environment where every dollar counts and resources are scarce, the software development organization needs to partner with the business to deliver quality services on time and within budget in a predictable and repeatable way.

The Software Delivery Crisis

To address “essential business complexity”¹ and achieve new business value, requires skillful execution involving a multi-disciplinary mix of business, software development and operational functions and roles. In change-sensitive business environments, software development heads are working against a minefield of odds. Their challenge: to manage and mitigate the shifting vectors of software delivery risk by exercising a series of trade-offs around the volatile constraints of schedule, budget, quality and scope across the entire application portfolio.

Pressures from the Business	Software Development Organization Pain
Competing business unit requests	<ul style="list-style-type: none"> ■ The constant flow of new project requests make it difficult to prioritize software development efforts across the potential application portfolio. ■ Management’s inability to select software initiatives that reap the best ROI, weakens the ability to efficiently manage the trade-offs relative to the constraints of time, quality and scope, as budget and resources are shifted between projects according to demand, skill, and availability.
Rapid response to new changes and shortened release cycles	<ul style="list-style-type: none"> ■ Software has to be delivered at a much faster rate (release cycles of 3-4 months are not uncommon). ■ It is sometimes impossible to keep track of changing priorities and requirements which are often poorly defined.
The deployment of services on time	<ul style="list-style-type: none"> ■ The production environment can be an unknown entity, with time-to-market compromised due to the multiple iterations often necessary to make applications deployable, operational and accessible to end-users.
Higher performance, quality and availability expectations	<ul style="list-style-type: none"> ■ The portability of services through multiple channels/pervasive devices now addresses more diverse user groups who typically demand extreme levels of performance and availability. Furthermore, application performance in production requires 99.999% uptime while enabling services to scale to support peak load levels.

Against a backdrop of increased industry regulation where failure can result in hefty fines, familiar statistics illustrate that success in software delivery is an unpredictable art form, mastered only by the very skilled and experienced software development managers and their teams.

- Approximately 33% of all projects are canceled prior to deployment
- Almost 75% are completed late contributing to lost market opportunity and value
- Nearly 50% fall short of originally scheduled features and functions* indicating a poor degree of reliability and predictability throughout software development efforts.

Rightly or wrongly, software development organizations are losing ground and credibility. With the greater impact amounting to a loss of business value and opportunities, an evolutionary yet significant shift to a more holistic approach is required to redefine the way that software is conceived, designed, built and delivered.

Making the Shift: Deconstructing the Chaos

To emerge from the turmoil, software development leaders need to take control, which in turn requires hard recognition of the dynamics inflicting the chaos. Underpinning the Borland Software Delivery Optimization vision is the recognition that the challenges of modern-day software development are centered around four common factors:

Organizational Chasms	<p>Conflicting and sub-optimal communication Chasms on cross-functional requirements between businesses, software development and operation teams impacting organization productivity and the risk of non-regulatory compliance</p> <p>Mis-alignment with operations teams causes issues in the production environment delaying the delivery of services to end users, while jeopardizing the fulfillment of Service Level Agreements</p>
Gaps Between roles	<p>Differing individual and specialized perspectives that exist within the business, software development and operational teams themselves. Disparate toolsets and repositories exacerbate a lack of visibility and control over the steps key roles manage and influence throughout the delivery process</p>
Technical Complexity	<p>Increased heterogeneity involving a mix of old and new technology</p> <p>The average software development team does not have a sufficient level of tools infrastructure to deal with increased technology complexity</p> <p>Proprietary technologies cause lock-in making it harder to leverage existing investments and adopt newer more agile technologies and approaches</p>
Distributed Environments	<p>Distributed teams, offshoring and outsourcing initiatives pose unprecedented levels of collaboration and communication issues across geographical and cultural barriers</p> <p>Process and tooling scalability is often poorly supported</p>
<p>Inability to address these four factors compromise the already volatile software delivery constraints of schedule, budget, quality and scope, further heightening the risk of failure and opportunity loss.</p>	

The impact of these common dynamics is highly dependent on the maturity of software development processes:

- Poor processes, and the inability to improve processes over time, has been a major reason behind software project failure as well as high rework, maintenance and software development costs, ultimately hindering business efficiency. The disparity in internal and external process (CMMI) levels is a major painpoint in the management of offshoring and outsourcing initiatives. Furthermore, under repeated time crunches, critical application lifecycle management (ALM) steps are often missed or poorly facilitated, leading to a range of issues from mis-set or poorly communicated business expectations to poor quality. Or conversely where (ALM) is practiced in conjunction with waterfall approaches, the risk of failure can increase due to non-iterative development practices that compromise change management.
- Even where processes are established, they can be ad hoc, and difficult to enforce. Getting people on board is difficult due to the diversity of perspectives across key organizational functions where the dominant fear against time to market pressures, is that process will make key activities and tasks take twice as long.

The bottom line is that the bridge between the business and software development organization today is often poorly enabled. Few software organizations have managed to combine the evolution of their processes (*for discipline*) with technology (*for speed*) and people (*skills enablement*). The irony remains that despite risk management as a top priority at the executive table, every other core business function supported by software, has become a managed process apart from software development itself.

The Next Era of Software Delivery

Software Delivery Optimization is Borland's vision and solution strategy for maximizing the business value of software by transforming the unmanaged software development art form into a managed business process. A holistic solution comprising an application lifecycle tools platform, server-based infrastructure, process optimization, best practices and skills enablement, it is designed to accelerate information flow, collaboration and visibility across core organizational functions and key roles, while enabling predictability and manageability of the overall software development process. Software development leaders will be able to transform chaotic environments through greater process control, empowered by a 360 degree view of their current and future project execution capabilities across the application portfolio.

Technology plays a major part in automating and enabling the software delivery process for speed and efficiency. The Software Delivery Optimization platform comprises a number of **envisioned attributes** that Borland is incrementally working on, with many elements already available today. These include: Real-time Visibility and Control; Process- and Role-Centric Productivity; Model-driven Development; Frictionless Deployment and Modular Flexibility

Real-time visibility and control is about achieving extensive manageability and visibility of the entire enterprise IT project portfolio and their related requirements throughout the development lifecycle to drive better collaborative project selection in terms of return against development, maintenance and operational costs.

This is established through comprehensive IT Project Portfolio Management (PPM)—for consolidated visibility and measurement of IT project progress including resource and skills allocation across lines of business.

Additionally **in-depth application metrics** provide PPM dashboard capabilities that are extended through the collection of critical application-level metrics for real-time progress and estimation, such as code quality, reuse levels, volume measurements and artifact relationships. Combined with **tightly integrated workflows** for extensive requirements management capabilities that drive the requirements flow down from the business level planning and estimation phases into execution phases, this facilitates extensive enterprise-wide impact analysis and change management.

Process- and role-centric productivity is the unifying essence of Software Delivery Optimization that provides the essential bridge between people, processes and technology. It involves the orchestration of the software development process across all roles in the organization, delivering visibility and control that spans traditional organizational boundaries. Key to this are:

- A highly configurable, rules-based process engine to support best-practice processes and custom, more agile processes. The engine ensures that audits and metrics are surfaced to provide an overall view of deviations from process standards and to promote process improvements. Process rules work in tandem with the source and change management system—an example would be that code check-in operations, would only be taken based on the fulfillment of certain conditions.

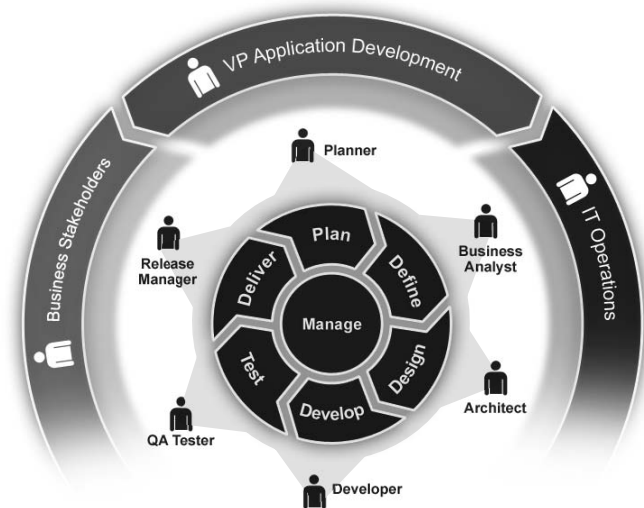


Figure 1: *Software Delivery Optimization, bridges the chasm between organizational functions and key roles to drive visibility and control of the areas of the software delivery process that they manage and influence, taking organizational, team and individual productivity to a new level.*

- The automation of software delivery workflows that provide a collaborative team-work foundation. Combined with a task driven approach, this ensures that roles within teams can participate as part of a managed process without extra burden to their specific job function (essential to process adoption). Individual productivity is boosted through the provision of role-based life-cycle solutions with information and functionality customized to the specific needs of the role to streamline and accelerate their execution.

Model-driven development is squarely focused on shielding software development teams from technology complexity through platform independent application modeling. Models are used by the Software Delivery Optimization platform to introduce business semantics into the language used by software teams. Pattern-based modeling environments increase the productivity of software developers, offering tried and tested application blueprints.

Software Delivery Optimization utilizes the concept of a Model Oriented Architecture to facilitate the realization of specific models on top of standard frameworks and architecture. The model itself is platform neutral, and can be realized to any supported target platform. These capabilities drive the enablement and standardization of an enterprise level service orientation, as it promotes platform-neutral models that are realized on a common service-oriented architecture.

Frictionless deployment is at the center of driving greater transparency between the software development and operations teams to minimize the problematic transition of applications in production. It includes the notion of collaborative, deployment-centric application modeling:

- Hardware and infrastructure are represented as physical models to represent deployment targets that reflect multiple possible configurations such as QA, staging and production. Platform agnostic and automatic deployment of applications into various environments is facilitated (operating systems, application, web and database servers), via automated provisioning of software and hardware resources that additionally assist the transition of applications between these environments.

- A meta-model for exposing application-level attributes and a management interface is established via the deployment model to drive platform agnostic management instrumentation. This meta-model can be used to facilitate manageability for the breadth of network and system management solutions already in use.
- Application configuration is greatly simplified with the deployment model providing an easier medium in which to capture configuration changes so that administrators can quickly restore a “healthy” configuration if a deployment of a new version results in disruption of service

Modular Flexibility is the last of the core attributes envisioned as part of the holistic Software Delivery Optimization Platform offering. It encompasses Borland’s unique approach and advantage, embracing heterogeneity to work with existing lifecycle tooling, technology investments and processes in play within customer organizations. As these tools often use different repositories, a major prohibitor of the end-to-end software delivery process, an open architecture facilitates and simplifies the integration of different vendor tools and repositories in use across the application lifecycle. A set of services communicate and interact with various back-end systems to automate and orchestrate the software delivery process. This exceptionally open service-oriented approach is planned in order to offer a high degree of flexibility.

Getting on Board Today

The transformation and evolutionary shift into a managed business process is a journey that will differ from organization to organization. Getting on board requires:

A. People and process assessment, comprising:

1. Evaluation of organizational software development process maturity
2. The establishment of milestones and success metrics
3. A comprehensive transformation program

Organizations on the path to process improvement are employing a vast array of methodologies and software maturity assessment benchmarks today including CMMI and Six Sigma. Borland has some of the world’s leading practitioners and thinkers on the advancement of software development practices, offering process optimization consultation to organizations across the maturity scale that establishes realistic goals and a roadmap for transformation. Organizations have access to the latest learnings as well as a plethora of templates and process assets to assist different development projects, team size and structure. In addition, Borland University delivers a curriculum around essential people skills development that ensures the appropriate application of technology to process automation and enablement.

B. Process authoring, automation and enablement

Borland Core SDP (Software Delivery Platform) is a significant step towards the instantiation of the Software Delivery Optimization vision. With a strong focus on process- and role- centric productivity to drive process adoption, it offers the first customizable and integrated development environment for application lifecycle management that provides comprehensive support for Business Analyst, Architect, Developer and Tester role functions. The foundation of Borland Core SDP is a central repository, accessible to all roles in the software development organization. This comprehensive management console optimizes information flow across the lifecycle, allowing individuals to interface effectively on common tasks and activities across the team.

Borland Core SDP provides the following core capabilities:

- Project management:** Reports, graphs, dashboards, and other analytical data can be easily viewed for insight into resource allocation, change requests, potential defects, and task management. With enhanced access to such information, managers can better measure and track project status, perform accurate impact analysis, and gather metrics to see how projects are progressing against initial predictions to keep the development process moving forward. Furthermore, access to real-time and historical data enables more accurate project forecasts to manage scope, resources and time to market.
- Automated workflow:** Flexibility to support custom or home-grown processes. Offers a task-driven approach to enable process participation and management. Each team member can create work records to identify actual time spent performing each task which can then be synchronized back into Microsoft Project to verify if the project is progressing to schedule.

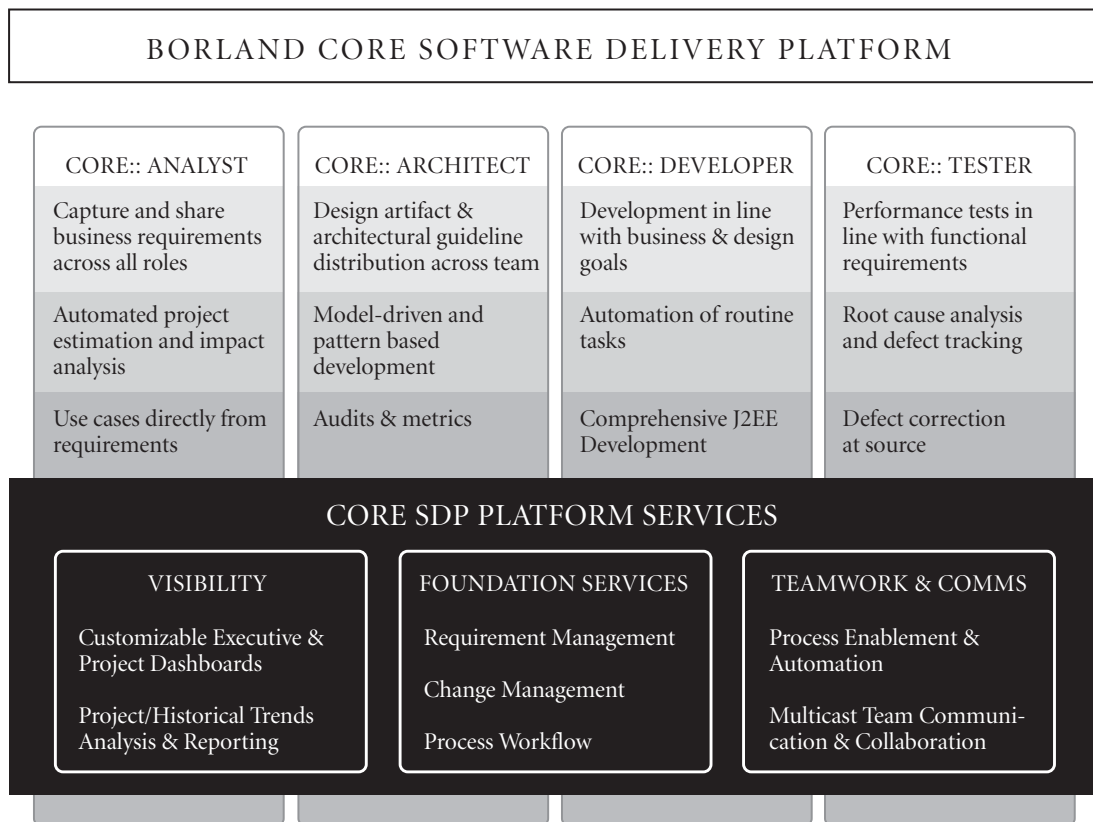


Figure 2: Borland Core SDP supports J2EE and Eclipse development environments. The platform provides an integrated management console and optimizes communication and workflow across the lifecycle to facilitate process adoption.

- **Asset management:** Critical software assets are managed and protected in a central repository with full version control, so that they can be, searched, accessed, shared, and reused across the organization.
- **Change management:** Each change request is defined according to type—such as a defect, enhancement or suggestion—and individually versioned and managed so that it can be tracked through to resolution. This makes it easier to verify that requested changes are made and responsible parties notified so that the team can remain responsive and agile throughout the project lifecycle.
- **Software Configuration Management:** The build and release management process is greatly simplified. Builds can be easily produced with correct components, while enabling parallel development tracks
- **Secure and distributed development:** Borland Core SDP manages secure access to software assets and deliverables across distributed team environments so that inputs across the globe can be effectively consolidated and coordinated to meet business expectations, quality benchmarks and compliance mandates (e.g. HIPAA, Sarbanes-Oxley and Basel II). Team members are accorded access only to areas that are relevant to them, and areas that should not be modified are locked and protected.

The Transformed Organization

As the software development process matures, new drivers of business value emerge, and consequently a more efficient, productive and responsive organization arises.

The examples within the industry combined with extensive Borland customer engagements are many. Eriksson, a global telecommunication equipment provider and long standing customer of Borland's Process Optimization Practice, has a 10,000 strong software development team and a \$2 billion expenditure on IT initiatives. The organization saw an emphasis on defect and rework reduction early in its transformation and realized improvements as high as 95%.

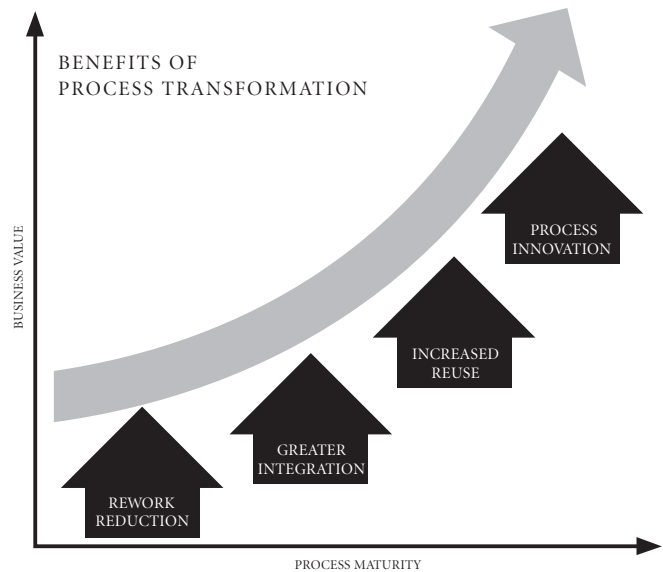


Figure 3: illustrates the benefits of process improvement as noted through the Borland process optimization practice and documented industry examples

More mature organizations, realize improved integration across roles and teams and also see significantly higher reuse. OMRON, a leading Japanese manufacture of embedded systems, saw reuse increase from under 30% to as high as 80% in some of its projects in the second phase of its process optimization program. Once again, business value was captured in the form of a 75% increase in productivity.

The most mature of these organizations, many of whom are operating at CMM level 5, have already exhausted most of these improvement levers early on. For instance, Motorola India, a CMM Level 5 company, has limited its cost of rework to less than 3% of its total costs, compared to the 30—50% seen by many large, mature enterprises. These companies continue to grow by setting higher goals and focusing on software process innovation to realize them.

Conclusion

Software development as a managed business process is about predictability and efficiency.

Integrated into the overall fabric of the enterprise, aligned with both business and operational objectives, the software development organization can drive the agenda for success. The empowered IT organization can mitigate unrealistic expectations with a solid view of the capabilities of their people combined with technology and process enablement. The resulting clarity enables a focus on the right projects across the portfolio for maximum business value, and the advancement of reliable execution with speed, precision and confidence.

Borland has over 21 years of experience in understanding software development issues. Whether you already have processes in place, want to improve or are just getting started, Borland provides excellence in software and services to enable you to structure software development as a managed business process. By taking control, software development leaders are no longer at the mercy of external business forces, ensuring that their organization becomes an equal participant in the shaping of IT initiatives across the enterprise.

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