

White Paper

HDS Accelerates Software Value

Agile Software Development Process

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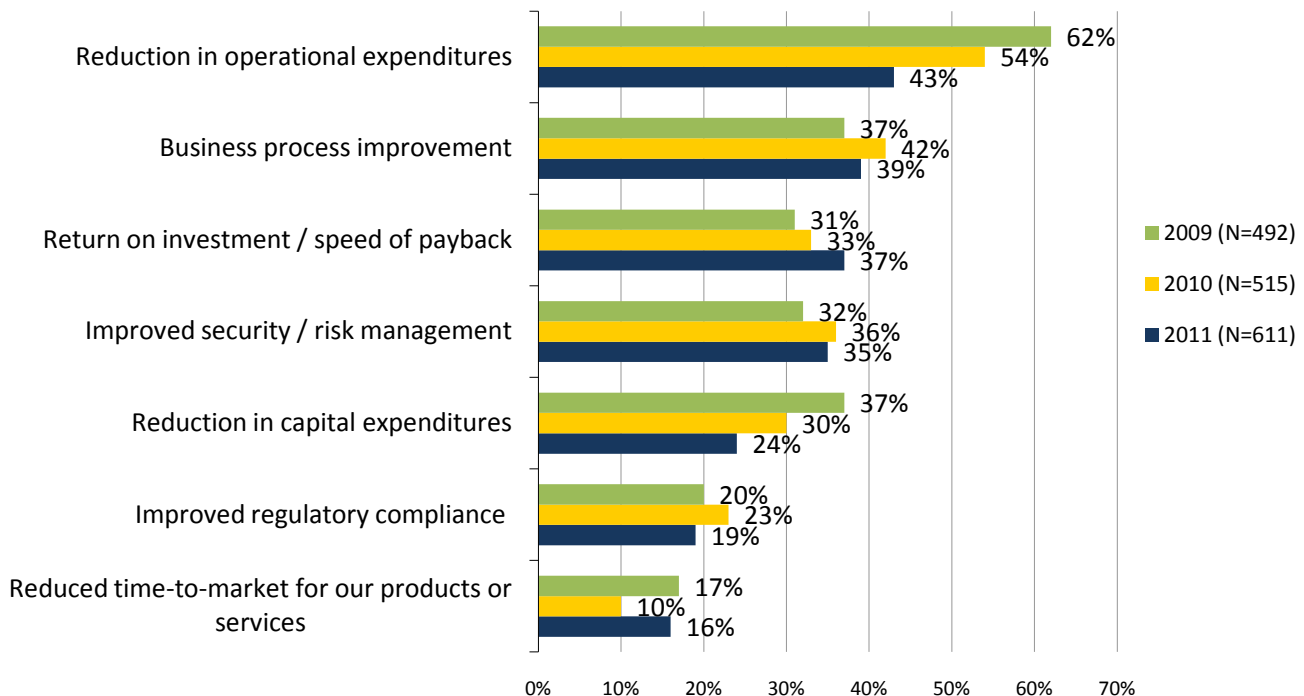
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Introduction

The Internet has created a truly global business environment in which all organizations and individuals are connected, the flow of ideas and information is instantaneous and unfettered, and customer expectations of speed, access, and responsiveness are sky-high. An organization’s success or failure in such a world often depends on its ability to adapt quickly to rapid changes and shifts in direction. Businesses look increasingly to their IT organizations for cost-effective solutions that make them more nimble and responsive, offer advantages through faster responses to new requirements, and generate value from one of the organization’s most critical, strategic assets: its information. Many IT organizations are transforming their technology infrastructures and deploying new storage, server, and network architectures to meet modern business demands: ESG research (see Figure 1) shows that reducing operational costs, streamlining business processes, and accelerating a return on investment among the top concerns of IT enterprises.¹

Figure 1. Keys to Justifying IT Purchases

Which of the following considerations do you believe will be most important in justifying IT investments to your organization’s business management team over the next 12-18 months? (Percent of respondents, three responses accepted)



Source: Enterprise Strategy Group, 2011.

Managing the rapid changes taking place in the enterprise can create its own set of challenges. Technology vendors work to stay ahead of the curve, developing new software and hardware solutions at a pace that matches the intense speed and flux of their customers’ requirements. Some vendors, such as [Hitachi Data Systems](#) (HDS), are looking to better align software development practices with the modern business environment. Knowing that customers must respond effectively to rapid change in order to succeed, vendors like HDS are exploring new development methodologies that accelerate release cycles, eliminate process waste, and tie development processes much more tightly to real time, real world requirements. HDS’s development teams utilized “agile” and rapid application development (RAD) methodologies in the latest release (V7.0) of the Hitachi Command Suite, a platform for managing virtualized storage and server environments. They customized their own new development methodology as an alternative to the traditional “waterfall” or sequential approach.

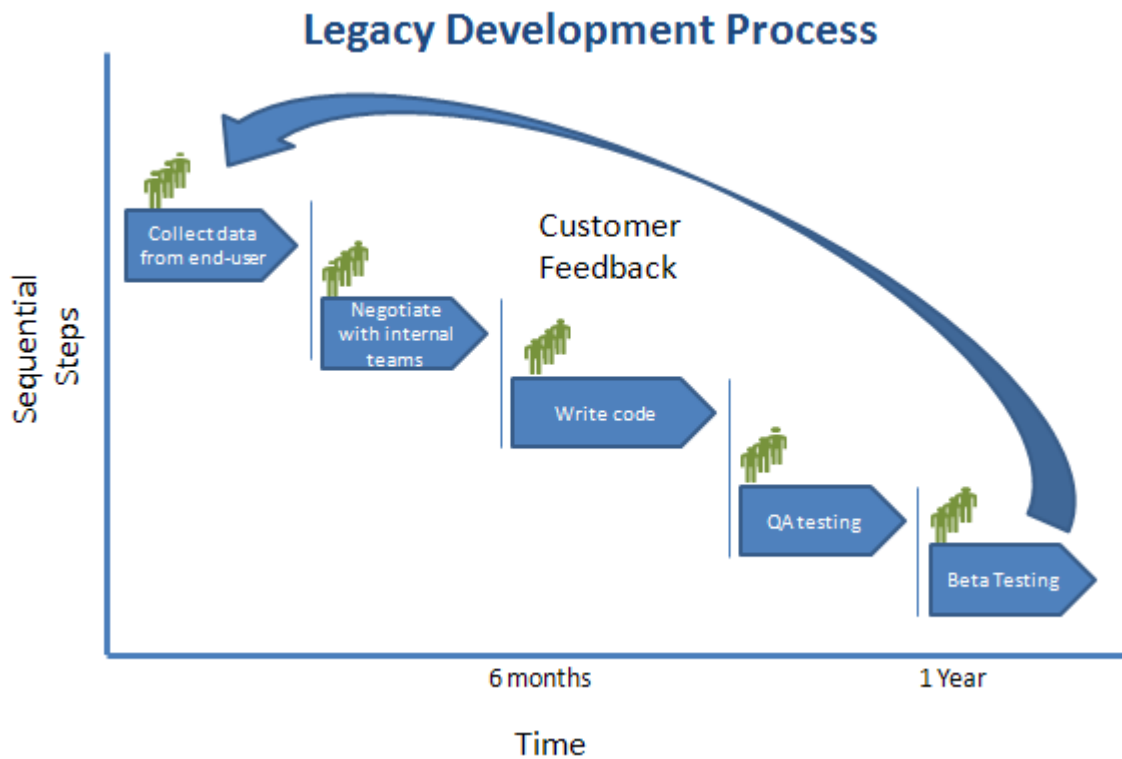
¹ Source: ESG Research Report, [2011 IT Spending Intentions Survey](#), January 2011.

Shifting from one software development methodology to another is no easy task and it carries a certain amount of risk. It can take years for a company to establish the processes, skill sets, tools, and culture necessary for a large (and often geographically distributed) development group to fully adopt a formal development model. But the pace of change and growth in today’s business environment is unlike anything that has come before: traditional development models still work, but in many cases companies and their customers have found them to be suboptimal in an environment of relentless, rapid change. HDS is taking a measured and calculated approach to exploring new options and has seen great promise in injecting new development philosophies and techniques into its software development environment.

Modern Challenges to Legacy Development Models

Traditional software development methodologies, such as the “waterfall” approach, have been widely adopted and refined over decades. These methodologies typically feature breaking large scale development projects into distinct, sequential phases—beginning with requirement gathering and analysis and prioritization, development progresses stepwise from one phase to the next through to design, programming, testing, and implementation with the goal of a monolithic, general availability (GA) release. For large-scale software projects, these methodologies usually deliver releases on a yearly (or sometimes twice-yearly) basis.

Figure 2. Legacy Development Process



Source: Enterprise Strategy Group, 2011.

While they have proven over the years to deliver high quality, production-ready software effectively, these legacy development models can carry significant risk in shifting business environments. Many buyers and users of IT software solutions are themselves in the midst of profound changes in their environments. Data growth is exploding, business requirements change every day, and new technologies such as virtualization and cloud computing models have thrown IT professionals’ worlds in flux. Many companies are deploying new architectures utilizing leading-edge technologies that require process and workflow redesign as well as new skills and role definitions. The bottom line is that in today’s fast-paced environment, a user of enterprise software applications might have completely different requirements next month. As pressure to reduce IT operational costs continues to mount, usability becomes increasingly critical.

Some fundamental characteristics of the traditional waterfall development approach can present challenges. Its objective is to deliver large-scale releases for general availability “all at once,” which makes for long development cycles often resulting in a full year between major releases. While this is perfectly viable for IT shops with well-established stable architectures, infrastructure transformations taking place in many IT organizations are occurring at a more rapid pace, requiring vendors to compress the time needed for requirement gathering, design, development, testing, and delivery.

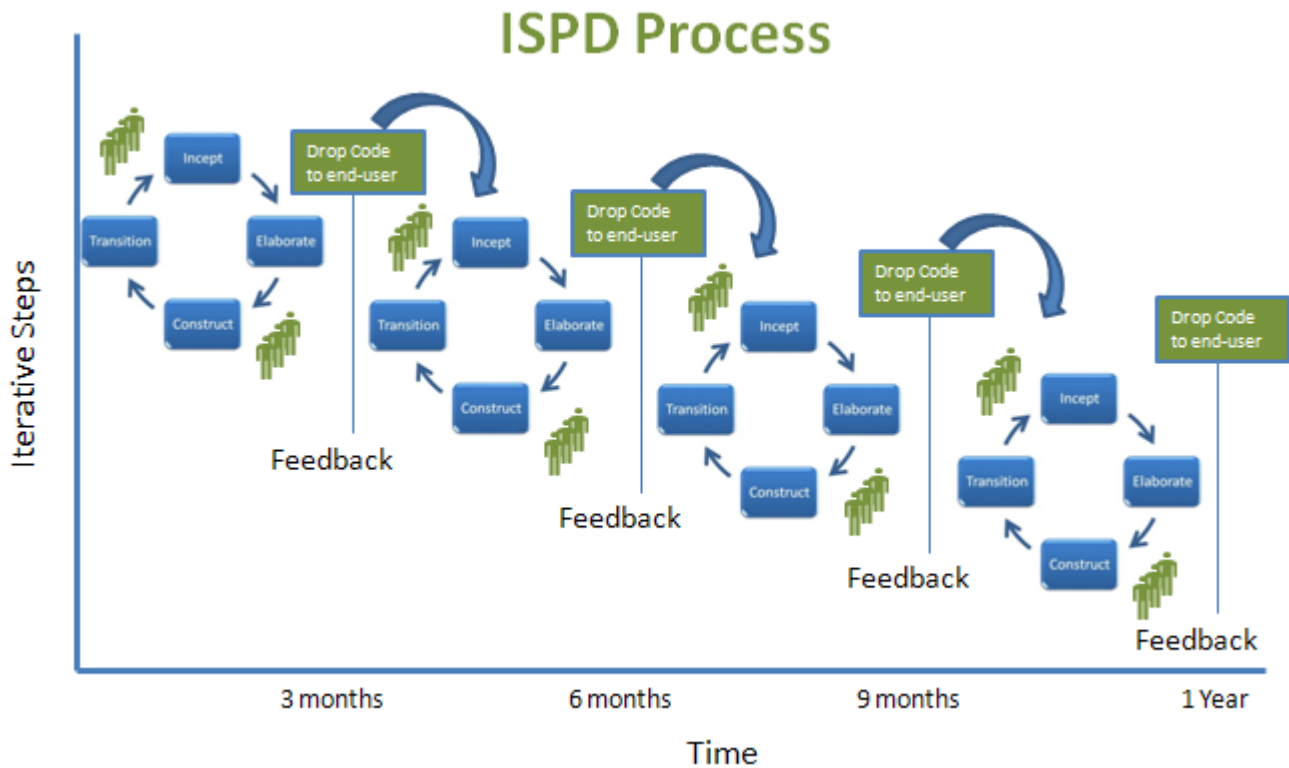
Traditional development models also tend to be both linear and front-loaded, relying heavily on the early planning and design phases of development. Once requirements are defined and prioritized (“frozen”), coding begins and it can be highly impractical to go back and make adjustments. Direct customer involvement and user feedback in the development process drops off sharply after the design has been completed as engineering teams intensify their focus on technical execution. If customer requirements change eight months into a one-year development cycle, little can be done but abandon the original specification and start over from the planning phase. External stakeholders who were instrumental in the early phases of development often wait for months to see real, working software. In the meantime, their IT organizations might be undergoing profound changes, generating new demands that have diverged from their original requirements and priorities.

Agile Software Development and Hitachi’s New Iterative Process

The need for alternative approaches to managing software development was already well known by the turn of the twenty-first century; a variety of groups had embraced new models such as “Extreme Programming,” “Scrum,” and the “Dynamic Systems Development Method (DSDM).” All of these approaches emphasized speed and responsiveness, continuous user involvement in the development process, and the need to produce working software in rapid, iterative cycles. Representatives from many of these alternative methodologies produced the “Agile Development Software Manifesto” in 2001. The manifesto lays out a set of core development principles based on the new, “lightweight” alternative methodologies. While it might be a stretch to claim that agile development has become ubiquitous, today its tenets are broadly understood and its popularity continues to grow. Its rise tracks in parallel with the intensifying, accelerating, and constantly shifting requirements of modern IT.

In the latest version of its storage management software, Hitachi Command Suite (HCS), Hitachi and HDS designed a new, agile-inspired development process called “Iterative Software Product Development (ISPD).” Hitachi implemented the ISPD process to accelerate HCS 7’s time to market, improve the user experience, and align the product’s features and usability more tightly with customers’ rapidly-changing requirements. Hitachi’s ISPD process embraces agile philosophies, utilizing components of Scrum, rapid application development (RAD), and the Unified Process (UP). The UP is a framework known to be effective on large, distributed development projects—Hitachi utilized UP to surround ISPD’s agile techniques with a structure and to keep the HCS 7 development process on track to meet its high level objectives.

Figure 3. ISPD Process



Source: Enterprise Strategy Group, 2011.

Before version 7, Hitachi had developed HCS using the traditional, sequential waterfall approach. The ISPD creates an environment in which the software is developed in frequent iterations with Hitachi development teams collaborating directly with customers throughout the entire development lifecycle. Each iteration is a complete, smaller-scale development cycle from requirements analysis, through implementation, and concluding with an executable release. Formal use cases, made more precise by ISPD’s ongoing customer involvement, serve as the core for each iteration’s design, implementation, and testing. The ISPD process builds QC into each phase to ensure that development speed does not come at the expense of product quality.

The Value of Hitachi’s ISPD Development Model

Hitachi’s new ISPD process is already producing impressive results for both HDS and its customers.

Benefits for HDS Customers

The ISPD process, which formalizes customer feedback throughout the development lifecycle, helps ensure the effectiveness of new software releases in addressing the real challenges emerging in the modern data center and promises improved usability to help drive down operations costs. The process’s shortened development cycles enable HDS to respond much more rapidly to changing requirements and help ensure product releases will evolve along with the transformations occurring in its customers’ IT environments.

A core benefit of the enhanced relevance of software developed through the ISPD model is that it enables customers to standardize on a single product, avoiding frequent “rip and replace” events between products and vendors to get the features, workflow, and functionality they need to solve business problems. The ISPD process creates software that reflects the rapid changes customers experience in a real IT environment, which drives higher

“With one or even two releases a year, you end up with negotiated functionality which may or may not be applicable to the customer’s business needs by the time it comes out. Now, with code drops every four to six weeks, our response to customers’ changing needs is much faster.”

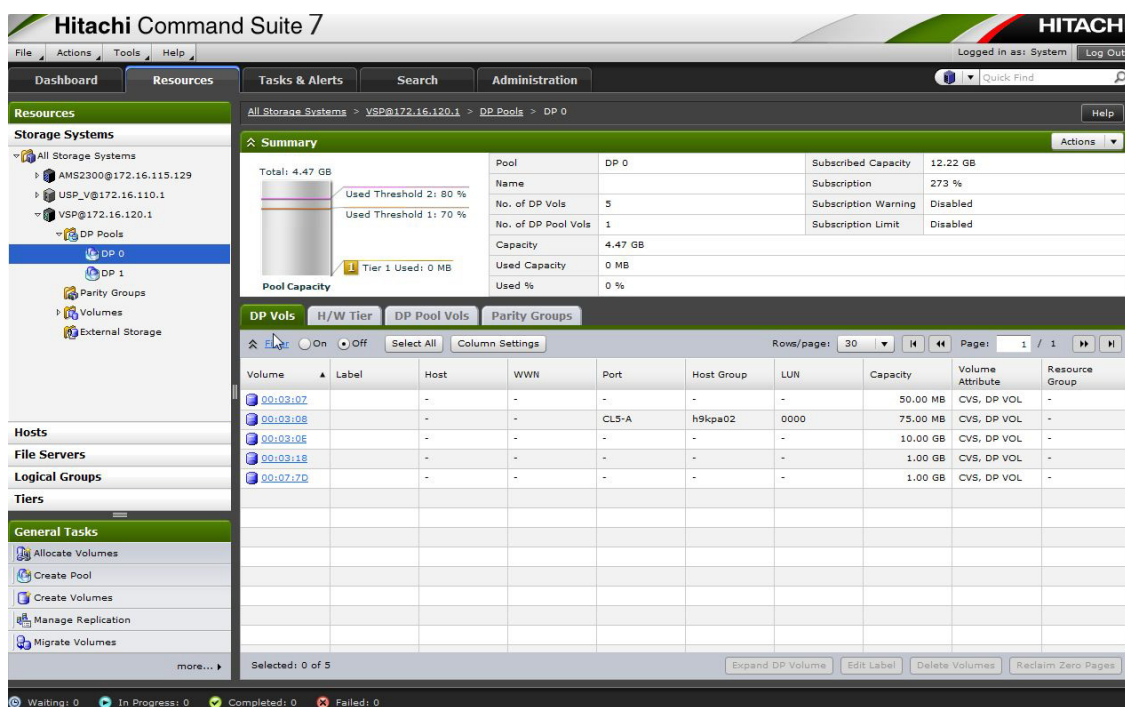
-Hiroyuki Kumazaki, General Manager
Storage Software Marketing, Software
Division, Hitachi, Ltd.

utilization and more benefit from the product. One of those benefits includes the fact that it now requires 40% less time to perform routine storage management tasks than in previous versions.

Benefits to Hitachi Data Systems

Development cycles that typically took up to a year from end to end have been segmented into much shorter cycles, enabling Hitachi teams to work with customers to continually fine tune requirements, make adjustments, and verify component designs and workflow of discreet components with frequent code drops and beta tests. Cycles involving minor components of the development project—such as GUI design changes requiring workflow tweaks, which in a traditional model might have taken several months—were commonly compressed to a matter weeks. While the GA release of the entire suite of HCS 7 was not significantly shortened, the development teams’ ability to work against well-defined customer pain points and requirement adjustments have allowed them to produce software they know will be relevant and valuable.

Figure 4. Hitachi Command Suite 7



Source: Hitachi, 2011.

The Hitachi teams were able to produce code much more efficiently within the ISPD model; managers have reported productivity gains as high as 90% with some development teams. Working closely with customers in an iterative process, development teams gained a clearer and more precise understanding of the requirements they needed to meet than they would have had from the tome-like documentation generated in a waterfall model.

The deeper, sustained engagement of customers in the development process has also produced some fundamental benefits to Hitachi and HDS on organizational and cultural levels. Traditional, linear development models create an environment in which customers, product managers, and engineers often find themselves in a state of constant negotiation: customers request certain features or delivery timelines; product managers shuffle them among the many priorities set at the front end of the process; and engineers, pressured internally to maintain the project’s original scope and design, are forced to push back. These interactions among stakeholders can become competitive, sometimes even adversarial.

“With the ISPD process, our conversations with customers are more about what we can help them accomplish and less about telling them what our products can do.”

– Bob O’Heir, Director GSSD Software Product Management, Hitachi Data Systems

With ISPD, HDS has seen this culture of negotiation shift to a culture of collaboration. The new process creates a development environment in which all stakeholders—customers, product managers, and engineers—are able to keep both the project’s objectives and inherent constraints in plain view. The new process reduces the occurrence of surprises—and lowers frustration levels—for all parties involved to create a true partnership that produces real results. Fundamentally, the ISPD process helps build a much more customer-centric organizational culture among development teams. ISPD affords Hitachi developers the opportunity to write code not just to meet abstract requirements, but to help real people solve real business problems.

Transitioning to Agile Development: Lessons Learned

The success of the ISPD process in developing Command Suite 7 has prompted Hitachi to begin extending its use into the wider development environment. HDS understands, however, that this is no trivial matter. Making the transition to agile development practices from traditional models is not a matter of flipping a switch: beyond the adoption of new processes, a large-scale transition requires a fundamental shift in the way all stakeholders—including architects, engineers, product managers, project managers, *and customers*—view software development and delivery. People will need to embrace new roles in the process, interact in close quarters with others who might hold different perspectives of the work, and adopt a shared vision for the team’s objectives.

Specifically, HDS learned:

- **Leadership is vital.** The HCS project showed Hitachi’s development leaders that such a transformation of development processes really amounts to a culture change; management buy-in and evangelism of the new development approach proved critical to the project’s success. Organizations considering this type of transition would benefit from strong leadership and continued commitment from an executive level.
- **One size does not fit all.** Hitachi has also realized that skill sets, culture, and programming practices differ from one development team to another across its global development enterprise. As the expansion of ISPD moves into other areas of the company, HDS will be careful about driving it as a corporate mandate. To accommodate the diversity inherent in such a large, globally distributed organization, product leadership plans to encourage development teams to embrace and craft their own customized versions of ISPD. And while ISPD’s early success might fuel the temptation to apply agile methodology across every product group, Hitachi leaders are still evaluating which areas make the most sense. The most promising areas for ISPD seem to be for software products that are heavily oriented toward end-users and user/application interactions, rather than back-end “black box” applications.
- **Development teams should be organized around functionality.** When development focus shifts to frequent releases of working software, the structure of development teams becomes critical. In the legacy development model, Hitachi had formed development teams to align with specific products. During the HCS 7 development project, however, HDS found the need to assemble agile development teams from a more generalized pool of developers. It is more fitting in the ISPD model to arrange teams according to functionalities rather than products.
- **Effective use cases are critical.** Hitachi will continue refinement of ISPD processes through lessons learned from development projects like HCS 7. HDS believes, for example, that improvements can be made in the definition and documentation of use cases, especially in addressing problems of subjectivity. With use cases playing a pivotal role in the design, development, and testing phases of ISPD, development leaders are examining ways to balance the precision of use case definitions with their applicability across a broad range of customers whose practices and workflow will vary from one organization to the next.

“It’s true that the new process has increased the efficiency and productivity of our development teams. But it’s equally important that we’ve been able to achieve faster customer response and improve output while maintaining the high levels of quality that our customers have grown to expect.”

– Shotaro Ohno, Director Storage Software Marketing, Software Division, Hitachi, Ltd.

The Bigger Truth

IT professionals operate in a very different environment today than they did even a few years ago. Shortened business cycles, increasing globalization, exploding data growth, and an ever-deepening reliance on IT to drive strategic business concerns have created a more fluid landscape in which IT must respond quickly and effectively to rapidly changing requirements. It is especially critical in such an environment that data center solutions are tightly aligned with the real-world, real-time concerns of the IT professionals who use them. Just as their customers are deploying transformative new architectures and technologies to address the realities of the twenty-first century enterprise, technology vendors must seek ways to align development operations more tightly with the fast pace and rapid changes of their customers' environments.

In developing the latest version of its Hitachi Command Suite software (HCS 7), Hitachi employed a new development methodology that utilized elements of Scrum, rapid application development (RAD), the unified process (UP), and other agile software development techniques to ensure a more positive and relevant user experience for HCS customers. The new formalized methodology, which Hitachi calls Iterative Software Product Development (ISPD), features rapid, iterative development cycles, extensive collaboration with customers throughout the development process, and frequent "code drops" that allow customers to evaluate and test discrete HCS components along the path to the GA release of HCS 7. Unlike the traditional waterfall development approach, ISPD allows Hitachi's development teams to respond quickly and effectively to changing customer requirements.

"In my conversations with HDS customers, I've learned that a CIO makes decisions based on three criteria: cycle time, cost, and risk. Improving our software development processes helps me have those conversations with CIOs. We're responding quicker to the needs of the business as we reduce the amount of time and money that it takes to manage vital information assets."

– Jack Domme, CEO, Hitachi Data Systems

The HCS 7 development project proved that the new ISPD process can deliver significant benefits to Hitachi Data Systems and its customers. The end product of ISPD is software that is highly usable and relevant to real-world needs while maintaining the high quality for which Hitachi's software has always been well known. Based on the project's success, Hitachi plans extend ISPD to other product areas with an understanding that significant and consistent training, communication, and management support will be required. While such major transitions can be difficult, Hitachi knows through the HCS 7 project that the new development process can be used successfully and has seen the benefits that agile development can produce for its products and customers.



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