Bridging the Product Introduction Gap

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New software and hardware technologies are driving product innovation at an unprecedented rate. Companies that thrive in this new era will adopt practices that foster product management and product development collaboration to blend new technology alternatives with sound market insight. This white paper identifies a technology trend that will increase the need for practices that can close traditional gaps between product management and product development. Construx identifies this practice area as "360° Product Introduction™", representing the importance of input from four directions during product and release planning and design: marketing, technology, stakeholder value, and product design. These principles and practices can also help IT organizations deliver solutions that provide higher value at lower cost for internal stakeholders.

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Introduction

New hardware and software technologies are driving an unprecedented rate of product introduction and evolution. For example, we use technologies like GPS navigation and smartphone video on a daily basis that would have been considered science fiction 30 years ago. The breakthrough iPhone and iPad are often used as examples. At the same time, new software technologies, growing computing power, and the Internet have driven new business applications like online banking, web commerce, and customer relationship management systems. This leads to several questions addressed in this white paper:

■ How significant is the trend in available technologies?

■ What is the impact on traditional product introduction processes?

■ What are the implications of this trend with respect to how companies introduce and evolve products and services to protect or lead their markets?

The Technology Tsunami

One measure of technological advancement is the annual patent submission rate. The data for 1963 to 2010 is available from the US Patent Office and is shown in Figure 1. Note the dramatic increase starting in 1984. What might be driving this acceleration?
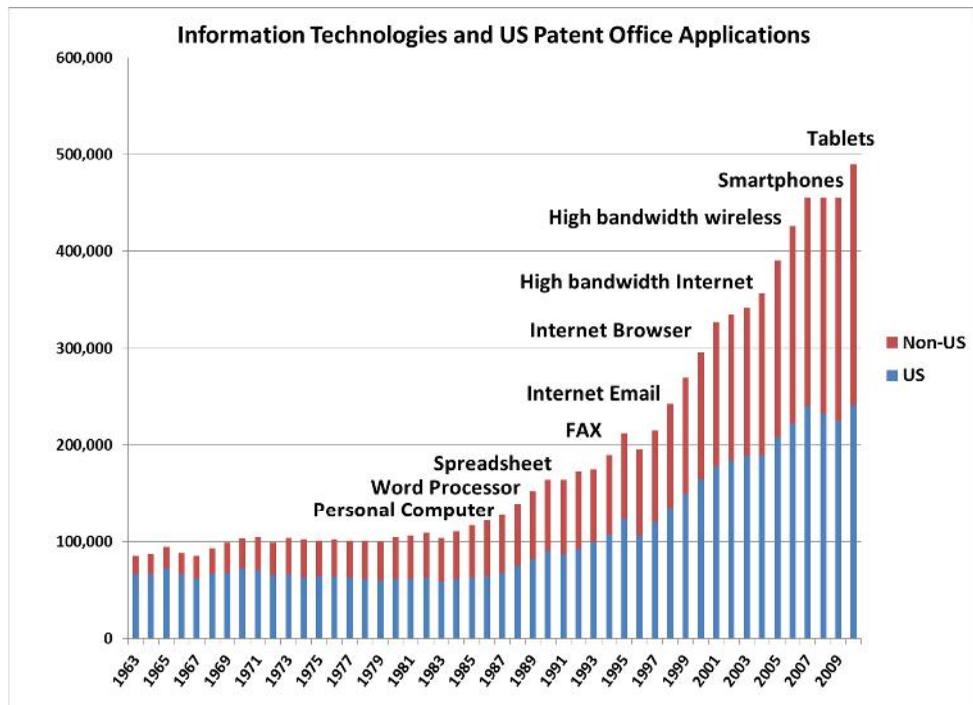
Figure 1 *US utility patent applications per year related to key information technologies*

The chart also overlays technologies that have greatly increased access to information over this same period. It appears that we are experiencing an unprecedented wave of technology that is at least partially driven by rapid and broad access to information. Product introduction rates are also driven by the number of existing products, technologies, and methods, which accounts for the exponential growth. For example, the iPhone would not exist without the prior development of flash memory or LCD touch screens. Construx refers to this phenomenon as the "Technology Tsunami."

Compare how a new product idea was introduced before 1983. An engineer would visit the company or public library and spend hours searching library catalog cards, selecting as many books as he thought he could physically locate and skim during the library visit. If he were lucky, he would find a couple of relevant books published in the preceding 3 to 5 years. After initial research, he may assemble information about technology components from vendor catalogs, sometimes having to wait for physical mail to receive specifications on newer electronic components…

Fast forward to today. A software engineer has a new product idea. A quick web search during the day shows there are products that are similar, but it supports the uniqueness of the idea. A few more clicks and the engineer learns about features of competing products and gets design inspiration from their technology white papers on the web. He can quickly browse through forums to determine what current customers like and dislike about the products. Later that evening, this process triggers another idea, which he immediately researches on his iPad.

The software engineer and a small team develop and deploy the software within 90 days using Platform as a Service (PaaS) technology from a leading cloud computing vendor—obviating investment for IT infrastructure. The rapid adoption is easily handled through the scalability of the cloud, with costs directly offset by subscription revenue. Within one year, legacy product companies find themselves losing significant market share. The CEOs are not happy, and they criticize their product organizations for missing the boat.

In the book *Race Against the Machine*,[1] the King's Chessboard fable is used to convey where we are today. This is a classic tale in which the emperor tells the inventor of chess that he can have anything he wants as a reward. The inventor asks only for one grain of rice to be placed on the first square of the chessboard, and each day to receive twice as much on the next square. Half-way through, the inventor has a field's worth of rice. At the end, he would have a pile larger than Mount Everest. The book states:

"As time goes by—as we move into the second half of the chessboard—exponential growth confounds our intuition and expectations. It accelerates far past linear growth,

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[1] Race Against the Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy, by Erik Brynjolfsson and Andrew McAfee (Digital Frontier Press, 2011)

yielding Everest-sized piles of rice and computers that can accomplish previously impossible tasks."

Can today's companies effectively leverage new technologies to protect and grow market share?

Product Introduction Process

Many companies today follow a formal product introduction process. The term "product introduction" has broad meaning in that it also applies to a product's evolution through new versions and releases throughout its lifetime. Today's product introduction processes were founded on principles of product management developed for soap products by Proctor and Gamble in the 1930s and that were widely taught in business schools in the 1960s. High-technology companies have adopted similar processes where product introduction is primarily driven by marketing requirements developed by product management. Will the traditional product introduction process stay ahead of the Technology Tsunami?

Product innovation today is often driven by companies that recognize the point at which new technologies can be applied to address problems previously thought difficult or impossible to solve. For example, it is unlikely that the iPhone would have come to fruition through a traditional marketing requirements document. It required the combination of good market sense and the ability of new technologies to provide unforeseen capabilities. A product introduction process today that is driven only from the marketing side has a high risk of being a missed opportunity. Companies risk being bypassed by competitors that can focus their product management and product development resources on a shared product vision.

Do you have a clear view of how your products and services will evolve to take advantage of rapidly changing smart-device technology and high-bandwidth wireless? What about cloud technologies? Or Natural Language Processing like IBM Watson and Apple's SIRI? Do you have a plan to benefit from up-and-coming OData (Open Data Protocol) to leverage web information for your products and services? Opportunity abounds for the company that can effectively leverage technology in its product introduction process.

Construx is not advocating that companies diminish the marketing component of the product introduction process. There are numerous technology-driven products that completely missed the target market. Even marketing genius Steve Jobs missed the mark earlier in his career with the NeXT computer. It was a technological marvel at its time, but it proved too expensive for the intended academic market. An effective product introduction process concurrently addresses both the market and technology sides.

The Product Introduction Gap

In a perfect world, the all-seeing, all-knowing product manager perfectly balances marketing and technology. Such product managers do exist, but Construx observes that gaps exist between product management and technology in many companies. The following table provides examples of typical gaps:

Product Management	Product Development
• "Our engineering department is not innovating, and we have fallen behind in the market."	• "Our product management tells us what to build based on experience with outdated products, leaving little room for technology and design innovation."
• "Business and market demands are dynamic, and our development processes are too rigid to deal with changing requirements."	• "I can meet the new schedule and requirements, but there will be substantial future costs because I need to take development shortcuts."
• "Our development team is moving to Scrum, and now I don't even know what features will be delivered."	• "My product manager is too busy. Just give us a dedicated product owner to help clarify requirements throughout our Scrum development cycles."
• "I can't get accurate estimates from product development."	• "Product management has unrealistic expectations of what we can predict and deliver."

Companies can't afford to let disconnects between product management and product development create mistakes in new products or releases. Construx has been a long-time advocate of early defect detection. Figure 2 emphasizes the relative cost of correcting defects based on where they were introduced in the development cycle
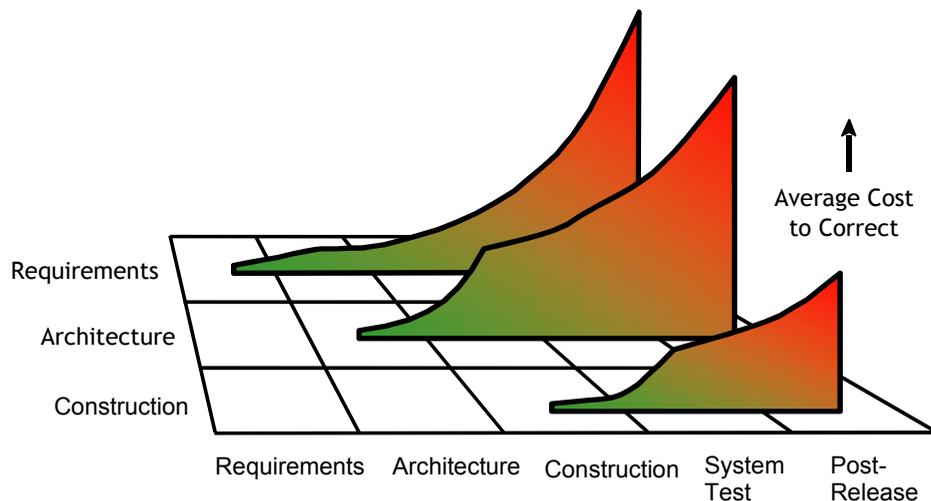

Figure 2 *Defect-correction costs categorized by stage of introduction*

What about errors made during inception for a new product or a new release? The product introduction process has the highest potential for costly mistakes that can put companies out of business.

Bridging the Product Introduction Gap

Which companies will thrive in this new age of accelerating technology? The survivors will be companies that can blend new market needs with practical technologies that solve problems in innovative ways. A new level of collaboration between product management and product development groups is required, from product inception through design and evolution. Companies with a one-way flow in their product introduction process will tend to create what exists rather than what could be. Larger companies will be increasingly vulnerable to losing revenue and market share to startups that have inherently close business and technical collaboration.

This leads to the question of whether practices focused on closing this gap can help companies make this transition. Construx has a long history of enabling development organizations with effective and practical software engineering best practices, many of which reside in this gap between product management and product development. These include topics like software estimation, release planning, and effective requirements. These practices apply to new Agile methodologies like Scrum, as well as traditional Software Development Life Cycle (SDLC) models. Construx is looking more deeply into practices in the critical juncture between product management and product development.

Construx refers to this set of practices as "360° Product Introduction," which is depicted in Figure 3. The compass points represent the Construx view of four critical areas that should be addressed concurrently throughout the planning and product introduction process. The marketing and technical sides are linked by the common interest of stakeholder value and great product design. Stakeholders are those who play a role in the success of your product, not just users and customer decision-makers. For example, an internal IT department would be a key stakeholder for a

Figure 3 *360° Product Introduction*

product delivered through Software as a Service. The Help Desk is another example. And the fourth point represents the attributes of great product design that heavily influence product success today.

Examples of practices that fall within 360° Product Introduction include the following:

- Soliciting and measuring stakeholder value drivers that empower the development team to innovate while maintaining a focus on stakeholder needs

- Forming and managing product core teams that can emulate the innovation and entrepreneurship of startups

- Collaborating to prioritize features based on business value and development costs

- Balancing the budget, the schedule, and features

- Aligning Scrum with business realities

- Managing technical debt to make implementation decisions that support short-term and long term company objectives

- Staying on top of technologies that have the potential to take your product to a new level, or those that can put you out of business

Product introduction is a rich area for practices that can bridge traditional organizational barriers to create and evolve market-leading and innovative products. Construx believes that today's processes can be improved by recognizing this as a specific practice area. These practices can help manage the nebulous but critical space between product management and product development to help companies survive and thrive in this new age of accelerating technology.

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Mr. Webber is a Senior Fellow at Construx with over 30 years of software experience delivering innovative products in telecommunications, entertainment, and life sciences. Bob's roles have ranged from software developer to executive R&D positions at GTE and AT&T, followed by engineering and product management leadership at three successful start-up companies. Bob's record of innovation is supported by five US patents and an Academy of Motion Picture Arts and Sciences Technical Achievement Award in 1999. As CEO, Bob led TranSenda to win Microsoft's Life Sciences Innovation Award in Clinical Development in 2009, and successful acquisition in 2010.

About Construx

Construx Software is the market leader in software development best practices training and consulting. Construx was founded in 1996 by Steve McConnell, respected author and

thought leader on software development best practices. Steve's books *Code Complete*, *Rapid Development*, and other titles are some of the most accessible books on software development, with more than a million copies in print in 20 languages. Steve's passion for advancing the art and science of software engineering is shared by Construx's team of seasoned consultants. Their depth of knowledge and expertise has helped hundreds of companies solve their software challenges by identifying and adopting practices that have been proven to produce high quality software—faster, and with greater predictability. For more information about Construx's support for software development best practices, contact us at consulting@construx.com, or call us at +1(866) 296-6300.

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