

Lean IT

Enabling and Sustaining Your Lean Transformation

Steven C. Bell • Michael A. Orzen



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“This book is long overdue. The IT world needs tools and concepts to be structured in their language and approach so they can join the productivity push that manufacturing has already experienced.”

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“This book is a must read for not only IT professionals, but business executives as it aligns information and information systems throughout the enterprise and supply chain, which improves organizational performance and agility.”

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author of Using Hoshin Kanri to Improve the Value Stream**

“This work integrates the Lean work over the past century and brings it to focus on the IT organization to eradicate the very drivers of IT wastes, replacing them with a value driven approach based on Lean principles. This comprehensive book should be required reading for all levels in the IT organization.”

**Mark Swets and Tim Schipper, Lean Coaches, Steelcase;
co-authors of Innovative Lean Development**

“From software development to help desk management, business leaders, IT professionals, and improvement teams finally have clear and concise answers to the question, ‘Yes, but, how does Lean apply to IT?’ Supported by compelling case studies, this outstanding book goes far beyond theory.”

**Karen Martin, co-author of The Kaizen Event Planner: Achieving Rapid
Improvement in Office, Service, and Technical Environments**

“Lean IT takes the game to a new level, particularly in the field of Lean Healthcare, where effective information systems are vital. I suppose I will have to buy multiple copies of this book -- So many IT managers in need of Lean education; so little time.”

**Tom Jackson, author of Hoshin Kanri for the Lean Enterprise: Developing Competitive
Capabilities and Managing Profit, winner of the 2007 Shingo Research Prize**

“Read it! Learn it! Do it! These pages are meant to be dog-eared, high-lighted, and coffee-stained. Within these pages are the keys to unlocking the value of information and information systems.”

Dennis E. Wells, Lean Evangelist, Oregon Department of Human Services

“The authors clearly articulate and demystify the overwhelming challenge of enabling IT processes and organizations to embrace rapid change demanded by Lean transformation. Lean IT represents an important body of work Lean practitioners desperately need to break through the plateau of unending point improvements into sustainable system wide improvements impacting the bottom line.”

**Rajesh Solanki, Corporate Director for Continuous
Improvement, RTI International Metals, Inc**

“Nearly every week, IT leaders ask me to help clarify their roles in their organizations’ process improvement efforts. This book not only answers how and why, it also gives great examples showing that it can be done in your organization too!”

**Steve Hoeft, Lean Six Sigma Director, Altarum Institute; Lead Instructor,
Univ. of Michigan Lean Manufacturing, Lean Product Design and Lean
Healthcare Certification courses; and author of Stories From My Sensei.**

“The gap from the implementation of Lean in production processes to office practices now has a bridge! Orzen and Bell are visionary showing the value of a fully integrated lean enterprise.”

**Elizabeth M. King, Executive Director Organizational Effectiveness, ESCO
Corporation; Association for Manufacturing Excellence, Director**

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Introduction

Today's IT organization faces a clear imperative: reduce costs while improving service levels. At the same time, it must assume an active leadership role to drive change—continuous improvement, innovation, and agility—throughout the enterprise, enabling efficient yet flexible business processes that create value and establish preference in the eyes of each customer.

How can these potentially competing objectives be satisfied with limited resources? For the answer, we turn to the lessons learned from Lean, which emerged in manufacturing during the 1950s and has since been embraced across every industry. It is now the time for IT to adopt Lean thinking as well.

This is the first definitive and comprehensive text on the *Lean IT body of knowledge*, demonstrating how the various aspects of Lean can be applied to the continuous improvement of information and information systems in order to enable and sustain the Lean enterprise. Written by Lean IT pioneers Steve Bell and Mike Orzen, this book distills over 40 years of experience in applying Lean principles, systems, and tools to information technology across many industries.

This book was written to help you—whether you are a business executive, manager, IT professional, or member of an improvement team—to proactively improve, integrate, align, and synchronize information and information systems to enable breakthrough performance and agility.

WHAT IS LEAN IT?

Is business process improvement part of Lean IT? What about best practices and benchmarking? Is agile software development a Lean IT practice? What about IT operational excellence and the ITIL service management framework? How about performance management dashboards and scorecards? Is applying Lean techniques to project management considered a Lean IT practice? And is cloud computing relevant in a Lean IT world?

The answer to all these questions is *yes*. But Lean IT is much more than just a set of tools and practices; it is a deep behavioral and cultural transformation that encourages everyone in the organization to think differently about the role of quality information in the creation and delivery of value to the customer. Lean IT enables the IT organization to reach beyond alignment toward fundamental integration, cultivating an inseparable, collaborative partnership with the business.

Whether you are new to Lean, or a seasoned veteran, in this book you will find new insights into the power of Lean and the critical impact of an integrated IT function. In this book, Bell and Orzen explore all aspects of Lean IT within two primary dimensions:

1. *Outward-facing Lean IT*: Engaging information, information systems, and the IT organization in partnership with the business to continuously improve and innovate business processes and management systems
2. *Inward-facing Lean IT*: Helping the IT organization achieve operational excellence, applying the principles and tools of continuous improvement to IT operations, services, software development, and projects

These two dimensions are not separate but complementary, two sides of the same coin. They serve the ultimate objective of Lean transformation: creating value for the enterprise and its customers.

We begin in Part 1 by exploring the foundations of Lean, and how they apply to information, information systems, and the IT organization. Part 2 then explores the various outward-facing aspects of Lean IT applied to business process improvement, supported by an effective Lean management system that links strategy with daily work. Part 3 explores inward-facing issues: how Lean IT improves the performance of IT operations and services, software development, and project management, while considering the implications of a shift toward cloud computing. Part 4 brings it all together, with a comprehensive perspective on Lean management and governance, offering a Lean IT roadmap to help readers on their own transformation journey.

The book concludes with case studies from several Lean leaders: Barry-Wehmler, Con-way, Group Health, Ingersoll Rand, Steelcase, Toyota, and Virginia Mason Medical Center. Each offers, in their own words, a

practical example of how Lean IT can enable and sustain the Lean enterprise transformation.

An ancient proverb says that the best time to plant a tree is 20 years ago. The next best time is *right now*. So let's get started.

Section I

Foundation

*What Is Lean IT and
Why Is it Important?*

1

Why Does Lean IT Matter?

Quality information and effective information systems are vital to the success of the modern enterprise. But the magnitude of IT spending on ill-conceived or poorly implemented IT projects is staggering. And the dire consequences of unstable and inflexible systems, failed projects, and chronic misalignment of IT activities with business strategy are unacceptable—and unsustainable.

The portion of the global economy spent on IT is substantial. For example, banking and finance enterprises in 2008 spent an average of 6.9 percent of their revenue on IT; this figure is a staggering 4.7 percent in health care.¹ If you begin with a conservative assumption that just 20 percent of these investments do not add significant value to the customer, the numbers add up quickly. And beyond the direct waste of IT dollars spent that don't return expected benefits, even more staggering are the consequences of poor-quality information and ineffective information systems on the productivity and general health of each organization, and by extension to the global economy as a whole.

Much is at stake here—clearly IT and the business must significantly improve the way they work together toward shared outcomes if they're going to produce ongoing order-of-magnitude improvement. *Aligning IT with the business* has become an all-too-familiar slogan. But what does *alignment* really mean? And what are the consequences when alignment is lacking? Let's hear from both sides.

THE BUSINESS VIEW

Business responds to change every day. Customers increasingly want more choice, speed, and quality, all at a lower total cost, while competitors wage a

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perpetual battle to steal market share. In order to succeed in such a dynamic and demanding world, business processes and supporting information systems must be both stable and responsive to change, always focused on delivering value to the customer. Unfortunately they often fall short.

Business perceptions of IT and the IT organization often include the following concerns:

- *Complexity*: Information systems are often difficult to use, costly, and resistant to change.
- *Speed*: The IT organization is often perceived as slow moving and late in responding to high-priority requests.
- *Misdirection*: The IT organization is focused on technical issues rather than on solving business problems.
- *Foreign language*: IT speaks a language that business people don't understand, and IT often doesn't understand the language of the business.
- *Information overload*: IT generates an overabundance of information; many workers suffer from data, e-mail and document waste, losing countless productive hours each week.
- *Project failure*: IT projects are sometimes costly, time-consuming, late, and disruptive, while failing to deliver expected benefits.
- *Fragmentation*: There are often many disparate, disconnected systems involved in each business process.
- *Poor data quality*: Data and information are often inaccurate, unreliable, inconsistent, untimely, or, in the worst cases, counterproductive.
- *Inadequate decision support*: Users are often frustrated by having too much data but not enough useful information, at the right time and in the right format, to support informed decisions.
- *Systems anarchy*: Many users attempt to control their own information with workarounds, spreadsheets, and homegrown systems, further contributing to data fragmentation, redundancy, and poor quality.
- *Cost focus*: IT is often perceived as a back office cost center, not an enabler of value creation or a catalyst for innovation.
- *Unclear return on investment (ROI)*: The business is often unable to measure the ROI of information systems investments, and evaluate the quality and effectiveness of IT performance. This uncertainty leads to a vague understanding of IT's true value to the business, which in turn leads to uninformed investment decisions.

THE IT VIEW

Now let's consider the other perspective: the IT organization is often overloaded, and reactive crisis management behavior is all too common. Constant change, shifting priorities, new releases and upgrades, and the need to balance existing and emerging technologies, all contribute to an untenable mixture of complexity and volatility. There is usually more work than IT could ever complete; some companies report three to five-year backlogs. And through it all, IT is tasked with keeping information systems, and the business, up and running at all times, while rigorously controlling costs. This often creates the atmosphere of a no-win scenario within IT.

Common IT concerns and challenges include:

- *Endless “firefighting”*: The amount of unplanned work often exceeds planned work, which is unsatisfying, exhausting, and ultimately not sustainable.
- *Unclear system requirements*: End users can't always articulate what they want and often ask for more than they need.
- *Conflicting priorities*: Business stakeholders are often unable to agree on priorities, so IT is caught in the middle with unclear goals, budgets, and timelines, having no choice but to pragmatically make important priority decisions based on incomplete information.
- *Lack of engagement*: IT is often brought into projects after important strategic and tactical business decisions have already been made.
- *Resource thrashing*: Due to unpredictable demand, magnified by unclear and shifting priorities, IT staff are frequently switched between projects, causing changeover costs, lost productivity, quality problems, frustration, and fatigue.
- *Excessive automation*: Rather than eliminating or at least simplifying wasteful processes, they are often automated, creating additional layers of system complexity and increasing total cost of ownership.
- *Poor data quality*: This creates additional errors, rework, and other downstream consequences, and is often caused by lack of end user training and documentation, and inadequate process design and controls.

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- *Scheduling of shared resources and services:* A constant challenge, since specialized resources (human and other assets) are often shared among multiple projects and operations, each with competing priorities, causing bottlenecks and scheduling delays.
- *Regulatory requirements:* These can add layers of non-value-adding activity. The business often focuses on after-the-fact reporting and control measures, rather than creating high-quality, consistent, and naturally compliant processes to begin with.
- *Outsourcing:* The business may believe that outsourcing administrative processes and IT services will reduce costs. However, decision makers may not fully understand the distinction between commodity processes and those that offer competitive differentiation and strategic advantage, nor realize that outsourcing may have unintended consequences by restricting agility.
- *Budget constraints:* There is a natural tendency to focus on IT cost cutting, rather than waste reduction—emphasizing value creation, innovation, and enterprise performance improvement.

WHAT CAUSES IT AND BUSINESS MISALIGNMENT?

The business and IT organization each have a long list of concerns and challenges—pain they feel every day. While Lean thinking stresses that every problem is an opportunity for improvement, business and IT stakeholders often have difficulty finding common ground, or even speaking a common language. As a result, over the years we have observed that IT organizations are often not aligned or synchronized with the business in supporting the continuous improvement of business processes. In fact, IT organizations can become isolated from the business operations they support, losing trust and respect.

Furthermore, because of the complex, volatile, and often risky information systems environment, traditional IT change management moves at a slow pace. System changes are deployed in carefully planned test-and-release cycles in an effort to prevent unplanned downtime and business disruption. This cautious approach to change inhibits business agility, and hinders the rapid, iterative, and continuous improvement of business processes.

What is at the heart of this disconnect between IT and the business? In our experience, the lack of integration and synchronization between the business and IT is caused by *unnecessary complexity*.

The world is becoming increasingly complex, and large enterprises have been drawn into ever more intricate circumstances. Global supply chains, the Internet, intense competition, business combinations, regulation, and security have led to increased *necessary complexity*. Small and medium-sized businesses are not immune to this trend, as they are often drawn into these same global business networks. Their business processes are often no less complicated than those of their larger counterparts, yet they often lack the IT sophistication and budgets to address them.

Beyond the challenge of necessary complexity, there is an enormous amount of *unnecessary complexity*—self-inflicted pain—arising from the inappropriate design of business processes and supporting information systems. Lean practitioners call this the waste of *overprocessing*: excessive work where cost and complexity exceed the benefits. The human mind has a natural tendency to make things more complicated than they need to be. While business processes and supporting information systems are naturally complex to some degree, if stakeholders do not deliberately and continuously simplify and improve them, they naturally degenerate over time, becoming more and more complex, costly to maintain, and difficult to use.

Overdesign is often the result of a predisposition toward technology and automation, rather than exercising the discipline to first simplify and standardize underlying business processes. This tendency becomes magnified when system designers are eager to deploy the latest technology, or enthusiastically develop elaborate solutions to potentially simple problems. The problem is further aggravated when unnecessarily complex information systems are applied to unnecessarily complex business processes; a compounding effect of waste (*muda squared*)* results. In this *perfect storm*, the unnecessary complexity of processes and their non-value-adding automation feed on each other—fueling a self-perpetuating cycle that can only be broken when business process owners and members of the IT organization work together as partners to simplify and improve processes before applying technology interventions.

* *Muda* is a common Lean term, the Japanese word for waste, and represents any non-value-adding activity or obstruction to the smooth flow of work processes.

Seasoned Lean practitioners know, often through firsthand experience, that many transformation efforts fail to sustain themselves over time, as organizations gradually fall back on old habits and familiar mediocrity. For a variety of reasons, the IT organization is often not proactively included in the Lean transformation process. Due to the interdependent nature of process improvement and IT change management, and because the execution of business processes frequently relies on technology, the lack of IT involvement in Lean initiatives is a common contributing factor for the deterioration of many otherwise sustainable improvements. Put another way, how could an enterprise successfully transform itself without addressing the role of quality information systems, and the active participation of the IT organization?

For this reason, we believe the next evolutionary step for many organizations, and the next frontier of Lean across all industries, is *the advancement of Lean IT practices to enable and sustain enterprise transformation.*

HOW LEAN IT ENCOURAGES ALIGNMENT AND CREATES VALUE

A Lean enterprise should empower teams to *simplify*, then when appropriate, *automate* routine tasks. Process improvement frees up capacity, providing individuals with more time and better information to exercise problem solving, creativity, and innovation in situations that are not routine. Early in the transformation effort, teams are often exhilarated when they realize they can streamline or even eliminate a frustrating process—one that has always been justified by saying, “That’s just the way we’ve always done it.”

Once improvement efforts gain momentum and the low-hanging fruit has been harvested, business and IT stakeholders work together to address the tougher issues that align strategy with daily activity throughout the organization. This naturally encourages the development of enterprise alignment in three dimensions:

1. *Vertically* aligning strategy up and down the hierarchal organization—from the boardroom through each geographic region, division, location, and department so everyone understands how their daily

activities support the shared mission, strategy, goals, and objectives of the organization.

2. *Horizontally* aligning stakeholders across every functional silo, process, and project—emphasizing the flow of value to the customer, rather than suboptimization of the individual process steps within traditional department or workgroup boundaries.
3. *Vertically and horizontally* aligning information systems—both manual and computerized—ensuring that IT enables the organization’s strategy and adds value to business processes, projects, and management systems. Synchronized vertical and horizontal alignment is the balance point for IT-enabled process improvement.

While opportunities for alignment may arise spontaneously during kaizen (continuous improvement) activities, orchestrating and sustaining alignment require a disciplined and systemic approach—a *Lean management system*, a topic we will describe and explore throughout this book. According to Womack and Jones in their classic *Lean Thinking*, “Our advice, based on years of experience, is that every organization should carefully team a system builder with each of its revolutionary change agents in order to sustain results.”²

More important than process improvement tools, lasting transformation requires effective management systems that prioritize work and align daily activities with those goals and objectives that are most important to the organization. In Lean, the focus of management is to create stable processes and standardized work which consistently deliver value to the customer. For a Lean management system framework to be effective, it must be simple to understand and execute, providing guidance while not getting in the way. It cannot be too controlling or rigid; otherwise, it will suppress creativity and learning, hindering improvement and innovation. And finally, an effective Lean management system must be supported by quality information.

Lean IT and sustainable Lean enterprise transformation are the result of collaborative problem solving guided by strategic intent. How is this lofty aspiration achieved? Let’s start with a working definition of *Lean IT* that we will build upon throughout this book:

Lean IT engages people, using a framework of Lean principles, systems, and tools, to integrate, align, and synchronize the IT organization with the

business to provide quality information and effective information systems, enabling and sustaining the continuous improvement and innovation of processes. Lean IT has two aspects: outward facing, supporting the continuous improvement of business processes, and inward-facing, improving the performance of IT processes and services.

MOVING FORWARD

For many years, Gartner (a global IT research firm) has been asking chief information officers (CIOs) to identify their top priorities. As you can see in Figure 1.1, businesses want IT to drive growth and value through alignment. But now, in the increasingly fast-paced and competitive global economy, organizations are turning to the IT organization as partners in *change leadership*.

Information, information systems, and the IT organization are tightly interwoven within the fabric of virtually every business process of the modern organization. IT *does* matter in the never-ending, always changing race for competitive advantage.

This is especially true as many IT infrastructure and commodity services shift to a scalable, low-cost, *cloud-computing* model. In this approach to information systems delivery, with utility-based infrastructure and service-based applications, the business will begin paying for functional utility rather than infrastructure. This will shift a significant portion of annual IT funding from the capital budget to variable expenditures, potentially making each investment decision more aligned with the business process it serves. Along with this shift, the business will expect change capability

Top 3 CIO Priorities	2006	2009	2012
Delivering projects that enable business growth	1	3	1
Linking business and IT strategies and plans	2	1	2
Leading enterprise change initiatives			3
Reducing the cost of IT		2	
Building business skills in the IT organization	3		

FIGURE 1.1
Strategic priorities from the Gartner CIO Survey.³

to be more rapid, less disruptive, and at a lower cost. The IT organization must therefore cultivate a clear focus on business process leadership, maintaining the appropriate balance between efficiency and flexibility ... also known as *agility*.

Sustainable information systems improvement and innovation cannot be achieved with a focus on technology alone. The Lean IT journey depends on continuously improving *people, process, and technology, in that order*. Eiji Toyoda, who retired as chairman of Toyota in 1994, sponsored Toyota's legendary Lean transformation beginning in the 1950s. He succinctly explained the relationship of people, process, and technology in the Lean journey:

Society has reached the point where one can push a button and be immediately deluged with technical and managerial information. This is all very convenient, of course, but if one is not careful there is a danger of losing the ability to think. We must remember that in the end it is the individual human being who must solve the problems.^{4*}

ENDNOTES

- 1 Gartner, "IT Spending and Staffing Report," November 2009, www.gartner.com/it/products/consulting/itkmd/2008/index.jsp.
2. James P. Womack and Daniel T. Jones, *Lean thinking*, 2nd ed. (New York: Simon & Schuster, 2003), 314.
3. Gartner, Meeting the Challenge: the 2009 CIO Agenda, (Stamford, CT: Gartner, 2009).
4. Eiji Toyoda, *Creativity, challenge and courage* (Tokyo: Toyota Motor Corporation, 1983); quoted in Jeffrey K. Liker, *The Toyota way* (New York: McGraw-Hill, 2004), 159.

* Note to the reader: The introduction of Lean is chiefly attributed to the Toyota Production System, which emerged in post World War II Japan—for a more comprehensive timeline of continuous improvement evolution see Chapter 2. At the time of this publication, Toyota is under intense public scrutiny for quality and safety concerns. In late 2009, just as this issue found its way into the public spotlight, the new President, Akio Toyoda, admitted that Toyota had lost their way in the late 1990s. Their focus on quality and customer satisfaction gave way to ambition for growth, global market share and profitability. Throughout this book we focus on Lean principles, systems, and tools that helped Toyota through their 50-year ascendancy in the global auto market. These same principles and tools have helped many companies in other industries as well. It is clear that even the venerable Toyota cannot violate their own principles without consequences.