

WHITE PAPER: LEAN IT

The Case for Lean IT

APRIL 2009

David Hurwitz

CA ENTERPRISE IT MANAGEMENT

WITH

Katherine Demacopoulos



Table of Contents

Executive Summary	3
Change and Persistence	4
Manufacturing Value	
Lean IT	5
IT Value Streams	
Waste Not	
Let the Value Flow	
Just-in-Time IT	
Strive for Perfection	
Visual Management Systems for IT	8
Transaction Visibility	
Business-IT Engagement	
Operational Excellence	
Security & Compliance	
Survive and Thrive	10
References	11
About the Authors	11



Executive Summary

Challenge

Today, IT budgets are being cut as the impact of the global economic recession becomes local. Yet the demands on it are no less than they were before. Customer service cannot be compromised, compliance mandates continue to proliferate and IT complexity is ever-increasing. With even tighter spending, a new approach is required to address these challenges.

Opportunity

Some leading-edge IT organizations have realized great results by applying Lean thinking to IT. The core philosophy of lean thinking can be summarized in four words: Maximize Value, Minimize Waste. Lean focuses on analyzing and optimizing Value Streams (the sequence of activities to design, produce and deliver a good or service) by removing non-value added activity, or waste. The beauty of Lean IT is its pragmatism. It rewards and even encourages incremental wins, doesn't require a grand overhaul of systems, and isn't obscure in its methodology, terminology or theory.

Benefits

CIOs should focus on optimizing the IT operations and processes supporting their most business-critical applications and services. Enterprise IT management software is a critical enabler of Lean IT because it provides the necessary insight and instrumentation into business services and the supporting IT assets, staff and processes. In addressing the problem of waste there are four dimensions that need to be considered:

- **TRANSACTION VISIBILITY** Provide insight into customer's experience and quickly identify the root cause of problems to ensure a positive experience
- **BUSINESS-IT ENGAGEMENT** Identify the true requirements of each business process, Evaluate the service delivery solution to identify non-value added activity
- **OPERATIONAL EXCELLENCE** Improve agility, service quality and efficiency
- **SECURITY AND COMPLIANCE** Streamline and automate compliance processes to reduce cost and risk



Change and Persistence

CIOs find themselves in a tough spot. The Great Recession is forcing many of them to operate with significantly less budget than before. As the businesses they serve seek to find their footing in the current tumultuous times, the priorities that IT must address are often shifting faster and more radically than ever before. Notwithstanding all this change, the expectations for service delivery from IT remain constant, and astoundingly high. Never mind the complexity of IT infrastructure, the range of security threats IT must address, and the ever-growing web of regulatory and legal compliance mandates IT must support. These “table stakes” must be mastered and addressed in the context of round-the-clock service expectations and support for business agility, cost reduction and innovation.

In short, the service expectations for IT remain the same, while the resources to deliver against those expectations are changing for the worse. What’s a CIO to do?

Manufacturing Value

IT experts have long used manufacturing as the most suitable metaphor for the challenges and opportunities of IT management. Like IT, manufacturing is a process-based service function that is in the business of producing value for customers. Unlike IT, manufacturing is rarely admonished to stay in alignment with the business, because manufacturing is the business, or at least is intrinsic to the business. Of course, so is IT in today’s on-line world. Whether in financial services, government, telecom, healthcare, retail, transportation, hospitality, or virtually any other industry (including manufacturing), IT delivers business services that allow customers to discover, order, pay and get support; allows suppliers to compete, collaborate, deliver, and get paid; and enables employees to do just about everything necessary for their jobs. In short, IT manufactures value for the business.

Notwithstanding the current economic crisis, manufacturing has long perfected a simple and effective process management system that ensures maximum value delivery to the end customer with minimum wastage of time and money. This system — known as Lean Manufacturing or Lean Thinking — has proved itself in up markets and down, in every sub-sector of manufacturing, in Asia, North America and Europe, and in the largest enterprises down to the most successful start-ups.

Lean came to prominence in the auto industry as the Toyota Production System, though it is perhaps best known in IT via Dell Computers’ massive success in rising to become the largest PC manufacturer in the world. Though now taken for granted, Dell turned the manufacturing process on its head by not building a computer until it had an order for that very computer. Order in hand, it swung into action, pulling parts from suppliers so that production workers could assemble them into a personalized product to be shipped shockingly fast to individual customers.

So if manufacturing is the most suitable metaphor for the management of enterprise IT, and Lean is the proven and pragmatic state-of-the-art for manufacturing management, what does that suggest for enterprise IT management?



Lean IT

Lean has been successfully applied to domains beyond manufacturing, including to enterprise IT on a case-by-case basis. The beauty of Lean is its pragmatism. It rewards and even encourages incremental wins, doesn't require a grand overhaul of systems, and isn't obscure in its methodology, terminology or theory.

IT Value Streams

The core philosophy of Lean can be summarized in four words: Maximize Value, Minimize Waste. Lean focuses on analyzing and optimizing Value Streams (the sequence of activities to design, produce and deliver a good or service) to remove non-value added activity, or waste.

Value is always defined from the standpoint of the end customer. For IT, the end customers include the executives running the business and the users (employees, customer customers, and suppliers) of the services IT delivers. Thus, IT's Value Streams are the applications and/or services that IT delivers to and for the business, along with the care and feeding of these applications and services.

To make IT improvement projects understandable to the business and to maximize their positive impact on the business, IT should analyze infrastructure and processes from a vertically-integrated point of view. That is, rather than trying to horizontally improve data-center operations supporting all business processes, a vertically-integrated approach would focus on optimizing infrastructure and processes supporting high-impact Value Streams first.

These high impact Value Streams are often, but not always, "cash-register" applications in that they directly drive company revenue and are used primarily by external (paying) consumers. Examples include point-of-sale or eCommerce applications.

Waste Not

In a physical manufacturing plant, tell-tale signs of waste and bottlenecks, such as stockpiles of inventory or work-in-progress, are easily visible; not so in IT. And yet, undoubtedly waste exists in even the best-run IT organizations. Server sprawl, underutilized hardware, manual processes, redundant applications, slow application response times: These are just a few of the signs of waste in IT.

In a paper titled "Lean IT: Waste Not, Want Not," Peter Waterhouse characterizes the 8 Elements of Waste in IT, commenting that "each element of waste considered independently is highly costly, but when aggregated together, these 8 elements can severely compromise IT's ability to support both internal and external customers on a sustainable basis."

EIGHT ELEMENTS OF WASTE IN ENTERPRISE IT

WASTE ELEMENT	EXAMPLES	BUSINESS OUTCOME
Defects	<ul style="list-style-type: none"> • Unauthorized system and application changes. • Sub-standard project execution. 	Poor customer service, increased costs.
Overproduction (Overprovisioning)	<ul style="list-style-type: none"> • Unnecessary delivery of low-value applications and services. 	Business and IT misalignment, increased costs, misuse of resources.
Waiting	<ul style="list-style-type: none"> • Slow application response times • Manual service escalation procedures • Slow employee on-boarding. 	Lost revenue, poor customer service, lower productivity.
Non-Value Added Processing	<ul style="list-style-type: none"> • Reporting technology metrics to business managers. 	Miscommunication
Transportation	<ul style="list-style-type: none"> • On-site visits to resolve hardware and software issues. • Physical software, security and compliance audits. 	Higher capital and operational expenses.
Inventory (Excess)	<ul style="list-style-type: none"> • Server sprawl, under-utilized hardware. • Multiple repositories to handle risks and control. • Benched application development teams. 	Increased costs: data center, energy; lost productivity.
Motion (Excess)	<ul style="list-style-type: none"> • Fire-fighting repeat problems within the IT infrastructure. 	Lost productivity.
Employee Knowledge (Unused)	<ul style="list-style-type: none"> • Failing to capture ideas/innovation. • Knowledge and experience retention issues. • IT staff spends time on repetitive or mundane tasks. 	Talent leakage, low job satisfaction, increased support and maintenance costs.



Let the Value Flow

In Lean, the principle of Flow dictates that the value-added steps in a given process should flow in a tight and integrated sequence. As you remove waste from IT, it's critical to ensure that the remaining process steps are integrated to optimize service delivery. It is especially critical to consider the handoff points between different departments as these handoff points are often where wait-time is introduced.

Here, integrated management solutions can automate the workflow between different departments, minimizing wait-time. Management tools can further support optimizing flow by automating key process steps. The degree to which different departments use a set of integrated tools and processes helps optimize the flow of value to the customer.

An example of this is change management. Suppose a business unit wants to adapt a given customer-facing application to add in features that would differentiate the service from competitive offerings. Supporting this business project requires tight collaboration between the application development team that would make the code changes, the operations team that would need to assess the impact of these changes on other services, the Change Advisory Board that would review, approve and schedule the proposed changes, and the operations team that would deploy the updated application.

Just-in-Time IT

Another key Lean principle is Pull, which states that no step should occur until triggered by a "pull" signal from the downstream step. For instance, just as Dell didn't start building a computer till getting an order for it, IT shouldn't provision servers till they're needed. Compare this to the more traditional "push" control mechanism, where capacity or inventory is stockpiled in anticipation of need. While pushing capacity into inventory provides a buffer against urgent demand, more often than not it results in waste through incorrect configuration, version control problems, and incipient quality problems, not to mention the carrying cost of maintaining idle infrastructure.

Therefore, one of the primary goals of Lean improvement initiatives is to reduce cycle times to remove the need to perform operations in advance of their pull signals. For instance, if server provisioning takes days or weeks, there will be an inclination to have stand-by servers provisioned just-in-case. A Lean approach would entail streamlining the provisioning process so that it takes only hours or minutes and resources can be provisioned just-in-time.

Along with cycle time reduction, significant attention must be paid to the form and mechanism of pull signals within IT Value Streams. For instance, pull signals from business executives may be handled through the portfolio planning mechanism of an IT Governance process, while initial pull signals from end users can be captured when they request a service via an actionable Service Catalog system. Ongoing pull signals from users stem from real-time transaction volumes, which must be monitored and managed via application performance management coupled to scalable back-end provisioning.

Strive for Perfection

Another critical Lean principle is Perfection. Like ITIL's continuous improvement phase, the Lean IT approach recognizes that great gains can be achieved through incremental improvement and that the journey to perfection never ends.



Visual Management Systems for IT

Lean manufacturing advocates the use of visual management systems to present and share critical information and facilitate process efficiency. Examples of visual management systems include:

- Status boards that show personnel availability
- Lights on machines showing status (red for unavailable, yellow for available and green for in use)
- Performance metrics posted in public areas that show throughput and quality performance

Perhaps the best-known is the kanban card system that production workers in the Toyota Production System use as inventory pull signals. These manually constructed visual management systems work well in discrete manufacturing industries like automotive and electronics because of the physically tangible nature of the work-in-process (WIP), and because the process steps being managed are typically conducted in a single location, on the manufacturing floor.

In IT, business services consist of bits and packets coursing through electronic infrastructure, the ultimate in intangible WIP. It's not visibly apparent which servers and infrastructure components are supporting which services. Moreover, the infrastructure and personnel supporting service offerings are often distributed across the globe. Here, then the need to visualize end-to-end transactions and the underpinning infrastructure of said transactions is even more critical. How can IT operations be streamlined, virtualized, automated or managed without visibility into what is going on in the IT environment?


The answer is that IT managers need enterprise IT management systems that provide visual management of business and IT services. These systems require an understanding of the infrastructure and staff supporting services, insight into the performance and utilization of staff and assets, and most importantly a level of data consolidation and presentation.

To optimize critical business services and achieve Lean IT, there are four dimensions that need to be considered:

1. Transaction Visibility
2. Business-IT Engagement
3. Operational Excellence
4. Security & Compliance

Transaction Visibility

To improve customer value, it is important to know what the customer is experiencing in their business interactions. Are your critical business services supporting a reputation for first-class service and responsiveness or causing frustrated customers to seek out the competition?



Given that virtually all externally facing applications are web-based, it is incumbent that the performance of these critical systems be managed. Modern application performance management systems can both monitor the end-to-end customer experience to measure responsiveness and also quickly locate the root cause to avoid the finger-pointing engendered by manual and after-the-fact sleuthing into performance problems.

Business-IT Engagement

The economic downturn has not diminished the demands on IT. Business executives still require new or updated IT applications and services to support their strategic initiatives. Employees still need access to services and service support. Change requests are unabated and need to be prioritized, approved, scheduled and managed through a controlled process.

Meeting and shaping these demands requires that IT and business leadership engage in a governance process that uses business-focused metrics as decision support. Further, business users should be able to directly request (i.e., “pull”) tactical and operational requests about the systems they use. Medium to large IT shops can only meet these requirements with modern project and portfolio management and service lifecycle management systems. Together, these systems can provide complete transparency into the cost, quality and function of every project and service so that the service portfolio can continuously be optimized.

IT has the ability to understand how systems are being used to execute business processes. This data can be brought to the business and waste can be discussed, decisions made, and action taken to improve the process and systems efficiency.

Operational Excellence

Strategies to achieve operational excellence include identifying and remediating bottlenecks, automating processes to reduce wait-time and errors, and optimizing IT asset utilization through virtualization and consolidation efforts. Just-in-time resourcing needs to become a key discipline within IT.

High-impact transactions are typically supported by web-based front-ends and a variety of infrastructure components, often spanning mainframe and distributed platforms. The mainframe, it should be noted, is an extremely lean platform due to its energy efficiency and extreme reliability. For optimal efficiency, it’s advisable to leverage an infrastructure management system that can accommodate complex, heterogeneous environments and can integrate processes across all layers of the operating stack from applications to servers, networks and databases.

Controlled change management processes are also critical for achieving operational excellence. Change management solutions help ensure that changes are scheduled to avoid a negative impact on the business, and reduce the risk of error and unplanned downtime.

ITIL is a very good complement to any Lean IT initiative in that it lays a framework to address the issues raised from a Lean process review. Lean process exercises will identify where waste exists; ITIL recommends best practices for improving and streamlining processes across the service management lifecycle.



Security & Compliance

When focusing on optimizing services to deliver more value and reduce costs, risk and compliance is a necessary consideration. Proving that only authorized users have access to sensitive information to support compliance initiatives continues to be a challenging and expensive endeavor that may become even more complex if new financial regulation compliance mandates are rolled out in the aftermath of the financial crisis.

Integrated Security & Compliance solutions help streamline and automate processes to remove waste from compliance processes and reduce the cost of assuring and validating compliance. At many companies, compliance processes are highly manual and redundant; many different groups use their own spreadsheets or other fragmented tool-sets, which can quickly become out of synch leading to further risk. Centralizing compliance information and standardizing processes and tool-sets, can reduce risk, remove redundancies and increase agility to respond as regulations change.

Survive and Thrive

Tough times end. Winners prepare to thrive in up-times even as they intelligently survive downturns. Lean IT provides a recipe for survival that simultaneously lays the groundwork for growth. Said another way, Lean IT is as much or more about thriving as it is about surviving.

The pragmatism of Lean IT means that CIOs can take advantage of it incrementally, adding value every step of the way. IT organizations can effectively maximize value and minimize cost by focusing on improving IT's high impact Value Streams across four critical dimensions: Transaction Visibility, Business-IT Engagement, Operational Excellence and Security & Compliance

Companies that take a Lean IT approach to increase efficiency and optimize their processes now, will be well-positioned to grow when market conditions ultimately and inevitably improve.

References

Lean Thinking: Banish Waste and Create Wealth In Your Organization, James Womack and Daniel T. Jones, June 2003.

Harvard Business Review, Lean Consumption, James Womack, Daniel T. Jones, March 3, 2005.

"Applying Lean Thinking To It," Forrester Inc, Alexander Peters, Ph.D., Alex Cullen, Tim Degennaro. January 4, 2008.

"Lean IT: Waste Not, Want Not," Ca, Peter Waterhouse, November 2008.

About the Authors



DAVID HURWITZ Vice President of Solutions Marketing, joined CA in August 2005 upon CA's acquisition of Niku Corporation, where he was Chief Marketing Officer. Prior to joining Niku in February 2003, he was Vice President of Marketing and Strategy at Perfect Commerce. Hurwitz also served as President and CEO of ConsenSys Software. He began his enterprise software career as an engineer at ASK Computer Systems. Hurwitz holds a B.S. in Industrial Engineering from the Rochester Institute of Technology in Rochester, New York.



KATHERINE DEMACOPOULOS is Vice President of Product Marketing for Enterprise IT Management. While at CA, she has been involved in a broad range of initiatives including the company's Lean IT, ITIL, on-demand computing and business service optimization strategies. She has 15 years of experience in the IT industry.



CA, one of the world's largest information technology (IT) management software companies, unifies and simplifies the management of enterprise-wide IT for greater business results. Our vision, tools and expertise help customers manage risk, improve service, manage costs and align their IT investments with their business needs.

MP338740409