VALUE STREAM MAPPING

How to Visualize Work and Align Leadership for Organizational Transformation

Karen Martin

Author of the Shingo Research Award–winning *The Outstanding Organization*

AND Mike Osterling

"Value stream mapping is often misunderstood and underutilized. Strategically, it can be a Rosetta stone to help bring disparate organizational silos together and a catalyst for stimulating and prioritizing enterprise-wide transformation. Karen and Mike have produced another terrific guide. Read it, practice it, share it, teach it."

—Steve Bell, author, *Run Grow Transform*

"*Value Stream Mapping* is a 'must read' that should be immediately followed by a 'must do.' It's a straightforward approach to achieve a truly Lean supply chain."

—Ed Brekke, Vice President,
Schneider Production System, Schneider Electric

"One of the most important tools in the Lean toolbox is value stream mapping. Done correctly—especially in non-manufacturing environments—it can serve as the foundation for a much broader Lean transformation. Martin and Osterling have created the new bible for value stream mapping. It is a must have for improving value streams in any industry. As they correctly point out 'very few things are unmanageable once they are distilled to their basic components.'"

—Art Byrne, former CEO, The Wiremold Company,
and author, *The Lean Turnaround*

"In *Value Stream Mapping*, Karen and Mike not only provide a great how-to book for transforming value streams, they also demonstrate the benefits that taking a holistic view can have on an organization's culture and commitment to customer value. There is something to learn for the novice and expert on every page."

—Jeff Chester, Chief Revenue Officer &
Senior Vice President, Availity

"Everyone in the office looks the same . . . a person in a cubicle facing a computer monitor. Value stream analysis helps a team learn to truly see the work and then to collaborate for improvement. This book brilliantly describes the process with good examples so you can get moving!"

—Jean Cunningham, author, *Real Numbers*

"Martin and Osterling describe why value stream mapping is necessary for *any* organization and how it can be used as the means to achieve strategic transformation. They've done a fabulous job at explaining the what, why, and how, as well as the pitfalls to avoid. Follow the guidelines in this book and watch your performance soar."

—Raju Deshpande, Senior Vice President,
East West Bank

"*Value Stream Mapping* is a wise and practical guide that will help you lead transformation efforts in your organization. While some think of value stream mapping as a 'Lean tool,' Martin and Osterling rightly emphasize the strategic value of looking at the big picture and improving your entire value stream from suppliers to the customer and all points in between. The book is full of tips and lessons learned to help you avoid mistakes and maximize the results that you get from the time invested into proper value stream mapping."

—Mark Graban, author, *Lean Hospitals*

"Value stream mapping has helped many organizations understand not only how to see, but to also improve and enhance the value they produce and deliver to their customers. But understanding how to accomplish this in information-intensive businesses has been a substantial gap in business and industry. Martin and Osterling unleash and deliver the principles, practices, and tools for organizations to not only fill this gap but, from their extensive hands-on experience, to understand, actuate, and extensively transform value streams to maximize enterprise-wide customer value."

—Jim Huntzinger, President & Founder,
Lean Frontiers, and author, *Lean Cost Management*

"Despite decades of viewing value stream mapping as the core tool of Lean transformations, there is still confusion. Karen and Mike put mapping in its proper perspective as a methodology for getting high-performing teams to see waste, share a future state vision, and build meaningful actions that are carried out with passion and purpose."

—Jeffrey Liker, author, *The Toyota Way*

"Value stream mapping stands as the best tool available to really grasp what's happening in your supply chain—allowing you to focus your improvement activities for maximum benefit. Nobody does a better job

than Martin and Osterling of laying out the nuts and bolts of engaging all levels in your organization in the application of value stream mapping to feed high impact continuous improvement. This is one of the best books available on the subject—buy it, teach it, use it—and your supply chain will become a competitive weapon!"

—Kevin Limbach, Vice President, U.S. Operations,
TaylorMade-adidas Golf Company

"Martin and Osterling have written an excellent book that shows you how to do value stream mapping and do it right. Follow their advice and your organization will get the profoundly radical change required to better serve your customers and create unprecedented profits and agility."

—Brian Maskell, author, *Practical Lean Accounting*

"Building on past works, *Value Stream Mapping* goes beyond the tool itself and effectively describes the leadership practices required to identify, improve, and manage value streams. Of particular note is the discussion on sustaining improvements, which is often difficult or even ignored. Karen and Mike describe how appropriate leadership systems can make it surprisingly easy. Wide-ranging examples make this book valuable to any industry or function."

—Kevin Meyer, former President, Specialty Silicone
Fabricators, Inc., and author, *Evolving Excellence*

"Value stream mapping has evolved from its roots as a tool used by geeks to reimagine and reconfigure manufacturing operations to a process to enable deep organizational intervention and transformation. With *Value Stream Mapping*, Karen Martin and Mike Osterling provide an outstanding guide for practitioners engaged in the challenging work of improving the horizontal flow of value across organizations."

—John Shook, Chairman and CEO, Lean Enterprise
Institute, and coauthor, *Learning to See*

"This is more than a primer on value stream mapping. Martin and Osterling hone in on the key conditions that should be set in place to ensure a successful outcome, and how value stream mapping can better align the leadership team. These pearls of wisdom and insight come from their many years facilitating and deploying Lean in a wide range of organizations, companies, and institutions."

—Rick Sunamoto, Vice President, Manufacturing,
HM Electronics, Inc.

"No complex journey should start without a map. Karen and Mike use a clear writing style and strong examples to drive this point home and to provide the tools needed to improve planning and performance in any organization. Their book is an important addition to the leadership arsenal."

—Daryl Tol, President & CEO,
Florida Hospital Volusia Flagler Market,
Adventist Health System

"Value stream mapping is a powerful tool in the hands of smart organizations. Martin and Osterling's latest book is a practical guide that will lead you through the important steps to creating value for your customers. Whether you work in healthcare or any other service industry, value stream mapping can improve your organization as it has mine."

—Daniel Wolcott, President & CEO,
Takoma Regional Hospital,
a member of the Adventist Health System

"Karen Martin and Mike Osterling have done it again! *Value Stream Mapping* provides the clarity and step-by-step guidance that is sorely needed to help Lean practitioners and leaders in the office. The experience and relevance they provide will make this the latest well-thumbed and often-referenced guide to enterprise value stream mapping."

—Jerry Wright, President, LEANwRIGHT, Inc.
and former Senior Vice President, Lean and
Enterprise Excellence, DJO Global, Inc.

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Karen Martin
AND Mike Osterling

Mc
Graw
Hill
Education

Contents

1

Value Stream Management

In most organizations, no one person can describe the complete series of events required to transform a customer request into a good or service—at least not with any level of detail around organizational performance. This gap in understanding is the kind of problem that leads to making improvements in one functional area only to create new problems in another area. It's the kind of problem that results in adding processes that increase operational cost but doesn't truly solve problems with root causes that reside upstream. It's the kind of problem that propels well-meaning companies to implement expensive technology "solutions" that do little to address the true problem or improve the customer experience.

The lack of understanding about how work flows—or, more commonly, doesn't flow—across a work system that's sole purpose is to deliver value to a customer is a fundamental problem that results in poor performance, poor business decisions, and poor work environments. Conflicting priorities, interdepartmental tension, and—in the

worst cases—infighting within leadership teams are common outcomes when a company attempts to operate without a clear understanding about how an organization's various parts fit together and how value is delivered to its customers. And significant time and money is wasted when organizations attempt to make improvement without a clearly defined, externally focused improvement strategy that places the customer in the center. Enter the concepts of value streams and value stream mapping.

What Is a Value Stream?

The term *value stream* was coined by James Womack, Daniel Jones, and Daniel Roos in the book that launched the Lean movement, *The Machine that Changed the World* (1990), and further popularized by James Womack and Daniel Jones in *Lean Thinking* (1996). A value stream is the sequence of activities an organization undertakes to deliver on a customer request. More broadly, a value stream is the sequence of activities required to design, produce, and deliver a good or service to a customer, and it includes the dual flows of information and material. Most value streams are highly cross-functional: the transformation of a customer request to a good or service flows through many functional departments or work teams within the organization.

An extended value stream includes those activities that precede a customer request (e.g., responding to a request for a quote, determining market needs, developing new products, etc.) or occur following the delivery of a good or service to a customer (e.g., billing and processing payments or submitting required compliance reports).

While many of a value stream's activities occur sequentially, others may be performed concurrently (in parallel) to other work. The activities in a value stream are not merely those that an organization

performs itself: work done by outside parties and even the customers themselves are part of a value stream.

Value streams come in many forms. The primary type of value stream is one in which a good or service is requested by and delivered to an external customer. Other value streams support the delivery of value; we often refer to these as *value-enabling* or *support value streams*. Examples of support value streams include recruiting, hiring, and onboarding; IT support; the annual budgeting process; and the sales cycle. Complex creative work can be viewed as having its own value stream—from initial concept to an executable design or to product launch. Product design can be viewed as a *value stream segment* if the design is required to fulfill a specific customer order.

Many value streams can go on and on in both directions. For example, a value stream could include all of the activities from the time a customer selects an architect until drawings are delivered to a general contractor. Or until construction planning is complete. Or until the final inspection after a structure has been built. Or until revenue has been collected for the construction work. The product life cycle is also a value stream consisting of specification, design, supply chain, manufacture, commissioning, operation, and ultimately decommissioning and disposal. A full value stream for patient care might include appointment scheduling, registration, diagnosis, treatment, aftercare, and possibly even receipt of payment. As you'll learn in Chapter 2, one of the first steps you'll take in preparing to analyze a value stream is defining the scope—the "fence posts" or beginning and ending points for review. This will depend largely on the problems you need to address or the performance improvements you would like to realize.

So how many value streams does an organization have? It varies. Small organizations may have only one customer-facing value stream and many internal support value streams. Large organizations could have 5, 10, or even dozens of customer-facing value streams and

hundreds of support value streams. Wherever there is a request and a deliverable, there is a value stream.

One way to determine how many value streams your organization has is by looking at the types of internal and external customer requests your organization receives and the number of variants of high-level process flows that each of those requests pass through.* Requests that pass through similar process flow sequences form a single "product family." To reap the greatest gains from viewing work and organizing the business according to value streams, you will eventually want to analyze and improve each product family's value stream. The best methodology we've found to date for this effort is *value stream mapping*, a tool that helps you visualize complex work systems so you can address the disconnects, redundancies, and gaps in how work gets done. Used properly, value stream mapping is far more than a design tool: it's the most powerful organization transformation tool we've seen to date. Once people learn how to think in value stream terms, it's difficult for them to look at work in any other way.

What Is Value Stream Mapping?

The roots of value stream mapping can be traced to a visual mapping technique used at the Toyota Motor Corporation known as "material and information flows." As the West grew intrigued with Toyota's consistent track record and began studying how Toyota's approach differed from its own, we learned that Toyota's focus on

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*It bears repeating: a value stream is a sequence of processes and activities an organization undertakes to fulfill a customer request. Functional departments (e.g., marketing, finance, community relations, IT) and desired outcomes (e.g., safety, high quality, regulatory compliance, employee engagement, and improved communication) are *not* value streams. Value streams typically cut across functional departments and produce a specific deliverable based on a customer request or regularly scheduled need (e.g., scheduled maintenance or an annual financial audit).

understanding the material and information flow across the organization emerged as a significant contributor to its ability to perform at consistently high levels. As a result, mapping these types of flows became one of the hallmark approaches used in the Lean movement to transform operations. But value stream mapping is neither clearly understood nor effectively utilized in all circles. To understand why, a little history is in order.

Lean is a term that means different things to different people, which is one reason why companies, government agencies, and not-for-profit organizations have experienced such wide-ranging results from exploring and adopting Lean practices. When you look at the history of how Lean was introduced in the West and the degree to which our collective understanding of this management approach has evolved, you can see why there's confusion about what Lean is and what it is not.

The term *Lean* was coined by John Krafcik in a 1988 article based on his master's thesis at MIT Sloan School of Management[1] and then popularized in *The Machine that Changed the World* and *Lean Thinking*. *Lean Thinking* summarized Womack and Jones's findings from studying how Toyota operates, an approach that was spearheaded by Taiichi Ohno, codified by Shigeo Shingo, and strongly influenced by the work of W. Edwards Deming, Joseph Juran, Henry Ford, and U.S. grocery stores. *Lean Thinking* framed Toyota's philosophical and operational bias around five key principles—value, the value stream, flow, pull, and perfection—and launched an era where thousands of companies attempted to mimic how Toyota operated. The Toyota Production System (TPS)—or Lean, as TPS and its newer iteration, Toyota Business Practices (TBP) are commonly referred to—became the darling of an army of consultants, authors, and improvement professionals.

While *Lean Thinking* provided a powerful foundation in understanding the basic concepts related to the actual delivery of value,

several of the most pressing topics in Lean circles today—leadership practices, culture, problem solving, and coaching—weren't explicitly addressed. This isn't a criticism of Womack and Jones's transformative work. They were clearly at the leading edge of this revolution in management thinking. But, two decades later, we can now look back and see how little Lean academics, consultants, and practitioners collectively understood at that time, about the full range of philosophical underpinnings and management practices that have contributed to Toyota's ongoing success. As more and more people and organizations studied and adapted Toyota's methods, new discoveries surfaced.

Eight years later, Jeffrey Liker published *The Toyota Way* (2004), which was the first comprehensive look into how Toyota operates in terms of its philosophy, processes, people, and problem solving approach. While this pivotal work included an explanation of the mechanistic aspects of operations design, Liker's background in sociology propelled him to dig more deeply into the cultural and leadership elements at play. Liker organized his findings into 14 management principles that captured the essence of Toyota's organizational and business practices.

However, even with this expanded view of the foundational elements that produce consistently high levels of performance, many had difficulty seeing the core beliefs and behaviors that allowed Toyota to perform to these levels, thrive when times were good, and to bounce back quickly when faced with difficulties. Perhaps our Western minds couldn't grasp a management approach that most of us had never experienced firsthand. Or perhaps we naturally gravitate to mechanistic solutions because they are concrete. After all, dealing with people is complicated and messy. Part of the reason may lie with those consultants who—even after Lean literature was replete with information about the vital role leadership, problem solving, and daily improvement played in transformation—continued to focus on

tools-based "implementation" versus people-based transformation. Whatever the reason, for many, their love affair with tools continued.

Value stream mapping was embraced as one such tool. Authors Mike Rother and John Shook studied Toyota's "material and information flow mapping" and recast the method as "value stream mapping" in the landmark book *Learning to See* (1999). The result of Rother's studies and Shook's 10 years of experience in a leadership role at Toyota, *Learning to See* provided us with the first tangible method for "seeing" the value streams that Womack et. al defined. After using value stream mapping for over 10 years to transform operations in nearly every industry, we believe it's the most powerful, yet under-utilized improvement "tool" we've seen to date. But the power behind value stream mapping lies in a little understood reality: it's far more than just a tool.

Value stream maps offer a holistic view of how work flows through entire systems, and they differ from process maps in several significant ways. First, value stream maps provide an effective means to establish a strategic direction for making improvement. The inclination to jump into the weeds and design micro-level improvements before the entire work system—the macro picture—is fully understood, is a key contributor to suboptimization.* As shown in Figure 1.1, work has various degrees of granularity. Value stream mapping, the macro perspective, provides the means for leadership to define strategic improvements to the work flow, whereas process-level mapping† enables the people who do the work to design tactical

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*Suboptimization occurs when you make an improvement to one component of a system while ignoring the effects of that change on the other components. A seemingly important improvement could cause the overall work system to perform more poorly. For example, if one department successfully reduces its turnaround time, but the faster output merely causes a larger queue and/or more work for the downstream department, the improvement may have a negative impact on the performance of the overall system.

† See our earlier work, *Metrics-Based Process Mapping* (Productivity Press, 2013) for our preferred process mapping technique. The book includes a CD with an Excel-based tool for documenting processes.

improvements. As you'll learn about in the next chapter, this difference signals the need for a higher-level value stream mapping team than what many organizations often think they need.

FIGURE 1.1 Granularity of work
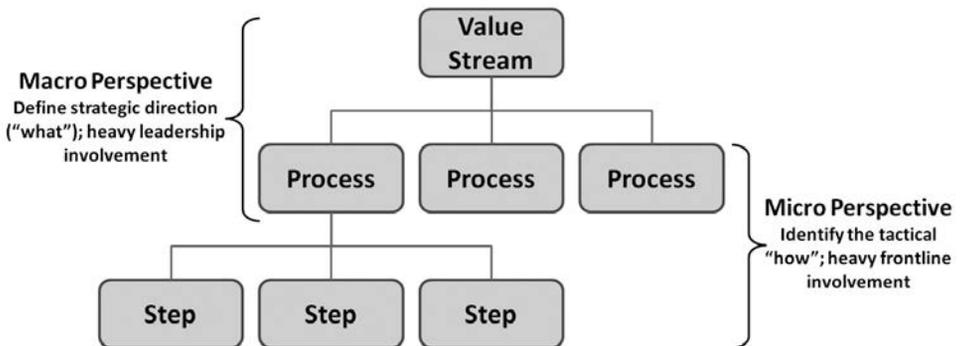
Second, value stream maps provide a highly visual, full-cycle view—a storyboard—of how work progresses from a request of some sort to fulfilling that request. This cycle can be described as request to receipt, order to delivery, ring to ring (phone call to cash register), cradle to grave, or quote to cash. A cyclical view places the customer (who is typically both the requester and recipient) in a central position, which provides a powerful means to view an entire work system as it relates to delivering customer value. As shown in Figure 1.2, visually depicting the cycle of work typically includes three components: information flow, work flow, and a summary timeline. Chapter 3 will describe each component in detail.

Third, the process of value stream mapping deepens organizational understanding about the work systems that deliver value and support the delivery of value to customers, which aids in better decision making and work design. By distilling complex systems

FIGURE 1.2 Basic current state value stream map

ABC Technology, Inc.
Current State Value Stream Map
Name of Value Stream Being Mapped
Demand Rate = XX / Year
Name of Value Stream Champion
Mapping Date

Customer

Information Flow

IT-1

IT-2

Work Flow

	Process 1	Process 2		Process 3		Process 4	Process 5
	2	**3**		**4**		**5**	**6**
	Function A	Function B		Function C		Function D	Function E
1 item	◎ 5	◎ 11	45 items ◎ 3		10 items ◎ 7		◎ 4
	LT = 1 days	LT = 0.5 days		LT = 5 days		LT = 2 days	LT = 1 days
	PT = 10 mins.	PT = 5 mins.		PT = 120 mins.		PT = 30 mins.	PT = 15 mins.
	%C&A = 50%	%C&A = 75%		%C&A = 85%		%C&A = 99%	%C&A = 95%

Timeline

1 days	0.5 days	5 days	2 days	1 days
10 mins.	5 mins.	120 mins.	30 mins.	15 mins.

Total LT = 9.5 days
Total PT = 180 mins.
Activity Ratio = 3.9%
Rolled %C&A = 30.0%

into simpler and higher-level components that can be understood by everyone from senior leaders to the front lines, organizations create common ground from which to make decisions. In addition, the mental shaping that's needed to succinctly define complex work systems is a boon when redesigning work to deliver greater value, faster, at lower cost, and in safer and more fulfilling work environments. There's a logistics advantage as well: value stream mapping enables a team to fully understand how work flows through a complex system in a matter of days, whereas detailed process mapping (which serves a different purpose) can take weeks or months and is too detailed to help in making effective strategic decisions.

Fourth, the quantitative nature of value stream maps provides the foundation for data-driven, strategic decision making. Measuring overall value stream performance and identifying the barriers and process breakdowns as the work flows through the value stream is a powerful way to drive continuous improvement so that an organization is able to better meet the needs of both its customers and its internal operation.

Last, value stream maps reflect work flow as a customer experiences it versus the internal focus of typical process-level maps. Many organizations are structured as a series of function-based silos that bear little relationship to the customer fulfillment cycle. As depicted in Figure 1.3, value stream maps force an organization to think holistically in terms of cross-functional work systems and product families. While this type of thinking can pose challenges during the future state design phase of mapping, it's exactly the type of challenge progressive organizations must embrace. Value stream mapping forces an organization's hand to either make the difficult structural changes that are more in line with the cross-functional reality within which they exist, or continue to deny reality, stick with outdated structures, and continue to perform accordingly.

FIGURE 1.3 Vertical organization structure versus horizontal reality
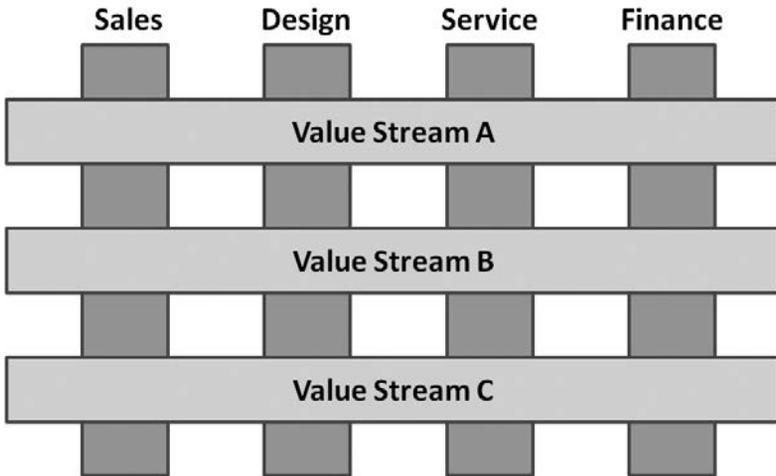
The Benefits of Value Stream Mapping

It bears repeating: the benefits of well-executed value stream mapping go far beyond how it's commonly but narrowly viewed: as a work flow design tool. While organizations rightfully turn to value stream mapping to serve a specific end (an improved value stream), they often miss the ample transformational opportunities that have longer-lasting and deeper benefits than the mapping results themselves. Transformation requires fundamental changes in an organization's DNA; done well, value stream mapping can be instrumental in facilitating the necessary shifts in mindsets and behaviors.

Visual Unification Tool

While value stream maps are powerful tools in improving manufacturing production work flows, they are arguably even more powerful when used to visualize work that's not particularly visual to begin

with. In most office, service, creative, and knowledge work environments, much of the work centers on information exchanges that are either verbal or electronic. The ability to visualize non-visible work is an essential first step in gaining clarity about and consensus around how work gets done.

Value stream mapping is particularly useful for visualizing how IT systems and applications enable (or don't enable) the provision of value to customers. The mapping process often reveals disconnects, redundancies, and unnecessary complication that otherwise aren't understood by everyone across the organization. We've seen significant and sudden project and budget shifts occur in technology areas because of the discoveries gained through value stream mapping.

In the hands of a skilled facilitator, value stream mapping is a highly unifying activity. It helps people see the need for improvement, and generates alignment and consensus around specific improvements being considered. The organization-wide clarity that results from gaining a cross-functional, fact-based understanding of the current state begins the process of identifying and accepting the need for change. Future state value stream maps (shown in Figure 1.4 and described in detail in Chapter 4) and the resulting transformation plans (described in Chapter 5) also serve as effective leadership alignment tools that improve organizational focus and reduce the risk of two departments moving in conflicting directions. The visual nature of value stream maps enables consensus-building conversations across the organization, from the front lines to senior leaders.

Connection to the Customer

Value stream maps provide a clear line of sight to the external customer from every function and work area involved in the value stream. This degree of clarity helps an organization make the transition from internally focused thinking to customer-focused thinking, which is the foundation for providing greater and greater value.

Figure 1.4 Basic future state value stream map

ABC Technology, Inc.
Future State Value Stream Map
Name of Value Stream Being Mapped
Demand Rate = XX / Year
Name of Value Stream Champion
Mapping Date

1
Customer

IT interface

**Standard
work**

IT-1

IT-2

**Error
proof**

**Cross-
train**

**Modified
approvals**

2
Process 1

**Cross-
train**

3
Process 2

**Standard
work**

4
Process 3

Function A

Function C

Function E

1 item

○5

5 items

○3

10 items

○4

LT = 1 days	LT = 2 days	LT = 0.5 days
PT = 10 mins.	PT = 120 mins.	PT = 30 mins.
%C&A = 99%	%C&A = 95%	%C&A = 95%

1 days	**2 days**	**0.5 days**	**Total LT = 3.5 days**
10 mins.	**120 mins.**	**30 mins.**	**Total PT = 160 mins.**
			Activity Ratio = 9.5%
			Rolled %C&A = 89.3%

The customer connection is no less important in value streams that serve an internal customer. Value stream maps provide a highly visual way to see the connections between internal suppliers and customers and stimulate important dialogue between customers and suppliers about expectations, requirements, and preferences.

Holistic Systems-Thinking Methodology

Value stream mapping also presents a pragmatic way to realize systems thinking, one of the pillars in the work of both W. Edwards Deming and Peter Senge.[2] When organizations see the interconnectedness of various departments and processes, they make better decisions, work together in more collaborative ways, and avoid the common and costly trap of suboptimization. There's little benefit, for example, in achieving faster patient flow through a hospital emergency department if there are no available beds in the patient care units to admit an emergency room patient into owing to a cumbersome discharge process. And we've found no more powerful way to heal the tension that often exists between functional areas, such as sales and operations, quality and production, and IT and . . . well, everyone! Value stream maps connect disparate parts of an organization into one whole with a singular goal: providing higher value to its customers.

In this regard, value stream maps present an effective tool for rethinking how an organization is structured and achieving functional alignment that aids in the delivery of customer value. Recalling Figure 1.3, while traditional organization structure and business management is based on functional silos, the customer experience is largely dependent upon the interplay between those silos. Value stream mapping provides a clear line of sight to the customer and the holistic means to clearly see how traditionally disparate parts of the organization are interconnected, which can serve as the catalyst for reorganizing according to value streams. Value stream maps also

provide unbiased, fact-based insight into how processes should be managed to achieve and sustain high levels of performance.

Simplification Tool

Business has grown increasingly complex, making value stream maps all the more relevant for managing business. Nearly every industry and organization is coping with increasingly high degrees of variation in customer types, needs, and expectations; inputs to the system; the process for producing outputs from the system; the features and functionality of the outputs themselves; the parties involved between the organization and the end user of a good or service; the location of those parties; and so on. Product customization is also on the rise. Value stream maps are powerful tools in visualizing and simplifying how work gets done at a macro level in order to make better and faster strategic improvement decisions.

The exercise of distilling complex work systems to their most essential and macro-level components builds critical thinking skills and creates a more manageable means for designing improvements to an entire system. Similarly, the process of defining "product families" (described in Chapter 2) helps people see commonality versus difference, a unifying discovery that can accelerate problem resolution and reduce resistance to change. For many organizations, creating these visual storyboards is the first time any one person has understood the entire work flow. Value stream mapping, done well, develops that degree of insight in *many* people. As Deming is commonly reported to have said, "If you can't describe what you are doing as a process, you don't know what you're doing." We'll take that quote a step further: if you can't describe what you're doing as a value stream, you don't know what you're doing. Value stream maps provide this clarity.

Value stream maps also counter the psychological tendency to feel that your world is more complex than any other and that it's

almost unmanageable. Very few things are unmanageable once they are distilled to their basic components. When you can gain alignment from people about how the basic components should operate at a macro level, you've taken a giant leap forward in gaining alignment about the specifics and creating ease in designing the specifics to meet a defined "macro" state.

Practical Means to Drive Continuous Improvement

Value stream mapping becomes an important step in using the Plan-Do-Study-Adjust (PDSA) cycle* to solve performance issues, capitalize on market opportunities, plan new product lines, and improve existing ones. The iterative and repetitive nature of improvement shown in Figure 1.5 is best served by tying improvement to a larger strategy. The future state value stream map provides the strategic framework (a blueprint) within which to make tactical improvement.

FIGURE 1.5 Cycles of continuous improvement

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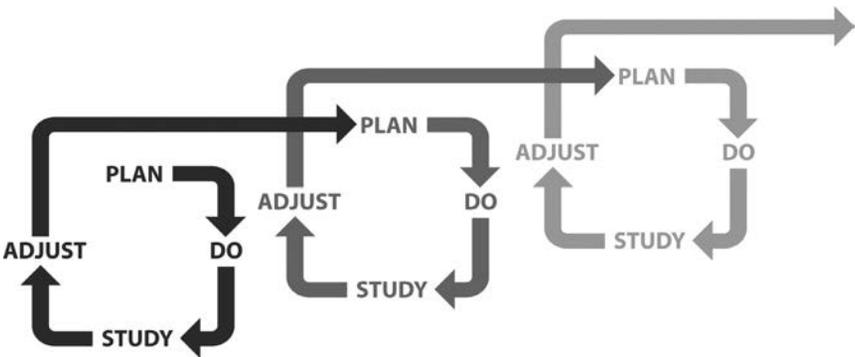
*The PDSA (plan-do-study-adjust) cycle is one of several scientific methods for problem solving, making improvements, and designing work of all types. We use PDSA throughout this book, but you may substitute PDCA (plan-do-check-act), DMAIC (define-measure-analyze-improve-control), Ford's 8D methodology, or any other cyclical scientific improvement method in its place. For more details about the PDSA cycle, see Karen's book *The Outstanding Organization* (McGraw-Hill, 2012) or any number of improvement-related books.

For this reason, value stream maps are highly iterative tools that need to be frequently consulted and updated as the value stream changes. We recommend physically posting the maps in strategic locations and holding regular stand-up meetings to discuss value stream performance and drive ongoing improvement. Value stream maps should not merely reside on shared drives. They are working blueprints for how your organization functions and should drive discussions and decision making at all levels.

Effective Means to Orient New Hires

Value stream maps also serve as a simple visual means to orient new hires during the onboarding process. Helping people understand where they fit in an organization fills a fundamental need all human beings have for connection and begins instilling holistic thinking from an employee's first day of work. Similar to a map in an airport or shopping mall that says, "You are here," value stream maps show employees how they fit into the larger picture and provide clarity about how the company operates. Organizations who seek to provide greater customer value need to make sure that every single employee understands his or her connection to the customer. Orienting new hires to value stream thinking the moment they arrive also serves the important goal of building a continuous improvement culture.

If you use the methods in this book to plan and execute value stream mapping, you will experience not only measurable improvement in how work gets done, but also significant cultural shifts. It's the *process* of value stream mapping rather than the maps themselves that carries the greatest power by instilling transformational mindsets and behaviors into the DNA of an organization. Effectively done, value stream mapping changes how people think and act, how they interact with one another, and how they view work. Problem solving has richer conclusions, and the solutions are longer lasting. Custom-

ers are happier. The work environment is less stressful, more fulfill-ing, and safer. And, assuming that customers place high value on the goods or services they're receiving, improvements that begin with a value stream perspective are more likely to be sustained and lead to both top-line and bottom-line growth. In the case of government agencies and nonprofit organizations, proper value stream design and management can reduce costs, improve organizational effective-ness, reduce the risk of privatization, free up cash to reinvest in the agency, and improve employee morale and constituent satisfaction.

COMMON FAILINGS WITH VALUE STREAM MAPPING

To fully leverage the power of value stream mapping, we recom-mend you avoid these common failings:

Using the Mapping Process Solely as a Work Design Exercise

One of the failings we often see is value stream maps being used mechanistically as a tool solely to improve value stream perfor-mance. While that's an important reason to map, going through the effort of creating value stream maps without experiencing its accompanying organizational learning, culture shifts, and leadership development benefits is like buying a Ferrari and using it only for city driving where the speed limit is 35 miles per hour.

Using the Map to Make Tactical Improvements

Too many organizations miss the benefits of value stream mapping by trying to use them to define tactical-level improvements, the pur-view of process maps. One visual cue that this problem exists is when we see so-called value stream maps that extend the entire length of a wall, containing 30, 50, or even more process steps. Another visual

cue is when the maps are formatted in swim lanes and/or are missing information flow. While it's true that many value stream maps—or portions of value stream maps—may need to be "drilled down" before actual improvement can be designed, tested, and implemented, that's the domain for process-level maps: defining the micro details about *how* specifically the macro-level change should be designed, tested, and implemented. The two types of maps serve two very different purposes.

People often ask us how to determine when they should use value stream mapping and when they should turn to process-level mapping. While it's situational, we nearly always begin with value stream mapping to align leadership and set priorities. We often turn to process mapping for those sections of the value stream that require deeper exploration and for creating standard work, an improvement requirement that requires more specificity than a value stream map provides.

*Creating Value Stream Maps During a Kaizen Event**

Related to the first two common failings is using a kaizen event as a venue for creating value stream maps. By nature, the two activities have different purposes and intended outcomes, require different people, and follow a different process. We regularly use process mapping in kaizen events, whereas value stream mapping typically precedes kaizen events. Let us be clear: kaizen events are a specific format for designing, testing, and implementing actual improvement, whereas a value stream mapping activity's purpose is to create a plan and alignment for improvement. Value stream mapping activities are strategic; kaizen events are tactical. Kaizen events should be heavily biased with the people who *do* the work being improved, and value stream mapping activities should be heavily biased with the people who *oversee* the work being improved.

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*Kaizen events are two- to five-day focused improvement activities during which a sequestered, cross-functional team designs and fully implements improvements to a defined process or work area. See *The Kaizen Event Planner* (Martin and Osterling, Productivity Press, 2007) for more information and to obtain a set of Excel-based planning and execution tools.

Creating Maps but Taking No Action

All too often we see organizations with beautifully designed current state value stream maps but no future state value stream maps. Or beautifully designed future state maps, but no action plan for realizing the future state. Or a detailed plan, but no significant action being taken to achieve the future state. Again, the purpose of value stream mapping is to improve the value stream. Many organizations need to move beyond where they often have the greatest comfort—analysis and design—and become far better at execution.

We do, however, have one rare exception to this rule. There are times when it can be beneficial to create a current state value stream map solely to build urgency for improvement or achieving clarity and "thought alignment" across a leadership team. For example, we've worked with organizations where the leadership team was so far apart in terms of priorities or even the need for improvement that we turned to current state value stream mapping as a learning and alignment tool. By gaining a fundamental understanding of the interconnectedness—or the lack thereof—that exists across the organization, leaders make better decisions, are more tolerant of each other's pain points, and become more collaborative in solving organizational problems. And seeing the undeniable need for improvement makes it more difficult for resistant leaders to ignore the need for change.

Some people may balk at using value stream maps this way, and we'd be lying if we didn't say that it concerns us to see mapping stop at the current state. After all, once an organization has clarity about how work flows (or, more commonly, doesn't flow), the natural next step is to use this knowledge to make improvements. So if you're tempted to create current state value stream maps to deepen understanding and achieve an alignment objective, lobby hard to take it to the next step: designing an improved value stream and then making it happen. As Goethe asserted, "Knowing is not enough; we must apply. Willing is not enough; we must do."[3]

Mapping with an Inappropriate Team—or No Team at All

Related to the danger of using value stream maps at a process level, many organizations miss the richness that comes from having the appropriate parties on the mapping team. Since value stream mapping is a strategic improvement activity and the future state map often requires significant organizational change, the team must include those individuals who can authorize that level of change. As you'll learn more about in Chapter 2, if no one on the team has the authority to make the changes, the future state map and transformation plan must go through a "sales" process, which can delay the initiation of improvements by weeks or months, or even stall them permanently. In addition to the risk of delayed action, the quality of decisions often suffers when leaders who can authorize change aren't present to witness the reality of the current state, feel the pain firsthand, and participate in the discussions that contribute to a team's decision that X or Y needs to occur. In our experience, postmapping sales processes often devolve into a game of gossip with the leader who can authorize change reversing the team's decisions because he or she doesn't fully grasp the reasons behind those decisions.

While it's a significant time commitment for leaders to serve as members of a value stream mapping team, it's by far the most effective and expedient way for an organization to initiate the transformation to improved performance. And we've found it's a highly effective means to shape leadership mindsets and behaviors in a way that accelerates organizational transformation. We'll return to leadership's role in Chapter 2.

Even worse is delegating value stream map creation to an individual. Value stream mapping is a team sport. A baseball team's not going to win many games if the pitcher's the only one practicing. *Learning to See*, the apt title for the first book about value stream mapping, says it all. It does little good for an organization to have

one person learning to see, especially if that person is a full-time improvement professional. And having one person decide how work should be done at a strategic level is a recipe for disaster.

*Creating Maps with No Metrics**

As we mentioned earlier in the chapter, a typical value stream map has three key components: information flow, work flow, and a timeline. Using time to drive improvement has proven one of the greatest contributions the Lean movement has brought to the operations design table. The timeline is, by extension, where value stream mapping shines its brightest light. Using a "ticking clock" to measure throughput and the time it takes for people to actually perform the work tasks, reveals more about work flow than any analytical tool to date. And, as we mentioned in the Introduction and you'll learn about more in Chapter 3, the quality metric, percent complete and accurate (%C&A), provides powerful insight into errors being made that introduce organizational chaos, add cost, cause frustration, delay delivery, and, in some environments, cause injury or death.

Unfortunately, we frequently see "value stream maps" with no metrics on them at all. This again calls to mind the Ferrari analogy: underutilization of a high-powered machine. How do you measure whether you've made improvements without a baseline from which to measure? How do you know what to focus on if you don't know how the value stream truly performs? While a picture's worth a thousand words, value stream maps without metrics have limited use. And one could argue that value stream maps without metrics aren't value stream maps at all.

That said, as we mentioned earlier, we do occasionally use current state value stream mapping to accomplish very specific objec-

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*Metrics are performance measures that are used to set goals, reflect current conditions, show trends, provide warnings, drive corrective action, and design and measure improvement. They're a means for tracking performance against goals.

tives, such as heightening awareness about how disparate parts of an organization connect to create the whole. We've also led mapping efforts that are designed solely to help inwardly thinking leaders see the value of looking at work from a customer's perspective. But if your intent is improvement, a map without metrics leaves you with no foundation from which to measure your success, nor a defined target to guide a team's design efforts.

WHERE SHOULD YOU BEGIN?

One of the most frequently asked questions we get from people in organizations that see the value of Lean management practices and are eager to begin reaping the benefits is, "Where should we begin?" A closely related question is, "When should we create value stream maps?" The answer to these questions depends on many factors. Ideally, an organization seeking transformation already has a clearly defined purpose, consensus around its strategic direction, clearly defined business goals, and alignment around a limited number of improvement priorities that are needed to meet or exceed its business goals for that fiscal year. If it doesn't, developing the practice of strategy deployment* is a wise foundational step before the organization gets too far down the value stream mapping path. The practice of strategy deployment enables an organization to create an action plan that focuses on a limited number of problems to be solved and/or opportunities to be leveraged. Once the problems and opportunities are clearly defined, the value streams that must be improved become rather obvious.

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*Strategy deployment is a method for defining and gaining consensus around an organization's priorities needed to realize its business goals. Developed in the 1950s, it's also referred to as policy deployment and *hoshin kanri*. For more information, see Pascal Dennis's *Getting the Right Things Done* (The Lean Enterprise Institute, 2006) and Thomas Jackson's *Hoshin Kanri for the Lean Enterprise* (Productivity Press, 2006). See Karen's *The Outstanding Organization* (McGraw-Hill, 2012) for a modified version of strategy deployment.

If your organization doesn't have a disciplined approach to setting annual goals and defining priorities (and remaining focused on both), and you aren't in the position to influence the development of such behavior, you may want to experiment with value stream mapping by selecting a value stream that is suffering from one or more performance problems, such as slow delivery, customer complaints, regulatory noncompliance, cost overruns, waning productivity, safety violations, low morale, and so on. We also recommend taking a look at the full value stream any time an organization experiences eroding margins; faces new competition or market share loss; or, on the positive side, wishes to improve operations to increase a company's market value.

Another situation that may call for value stream mapping arises when, during the course of problem solving using A3 management,*a team needs to gain high-level clarity about how work flows across many functions or work teams. In this case, value stream mapping becomes an option for gaining the necessary understanding to surface problems and identify the root causes for those problems.[†]

We also recommend value stream mapping as a fundamental tool for improving overall responsiveness to customers, designing and rolling out new product lines (including the development process on the front end and the service process on the back end), forming partnerships and joint ventures, integrating acquired operations, and as a required predecessor activity before any sort of organization

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*A3 is an effective and systematic means for developing people and building strong organization-wide problem-solving capacities. For more information, see *Managing to Learn* (Shook, The Lean Enterprise Institute, 2008) and *Understanding A3 Thinking* (Sobek and Smalley, Productivity Press, 2008).

[†]The opposite is also true: the process of value stream improvement could spawn the need for A3 problem solving, a situation you'll understand more fully by building familiarity and proficiency with A3 management. Organizations that have developed a strong A3 culture may wish to use the A3 approach to define and track their value stream transformation activities.

redesign is contemplated. In the latter case, value stream mapping can protect you from making decisions using outdated paradigms, such as the common generalizations that "functional departments are more efficient," "economies of scale will drive down costs," and "centralization is better." These cookie-cutter beliefs may or may not be the case; value stream mapping is an effective tool for deeply exploring the pros and cons of centralization and decentralization, and for clarifying functional roles and responsibilities. Companies that choose to reorganize without understanding their value streams may experience short-term improvement, but longer-term gains are far more likely by using value stream thinking to shape the reorganization. After all, if you don't truly understand what needs to be done, how can you design an organization that satisfies the needs?

The bottom line about where to begin and when to map is that it often depends on organizational maturity and experience with Lean principles and improvement. Less experienced organizations may want to begin by identifying a value stream that could benefit from improvement, isn't too complex, has a motivated executive sponsor, and is highly visible. More mature organizations may want to conduct value stream mapping as part of their strategy deployment process. In either case, value stream mapping is a powerful discovery and design tool for addressing value stream–related problems or for raising the bar and improving performance to build a stronger organization, stay ahead of the competition, and continue the journey to optimal performance. We define optimal performance as delivering customer value in a way in which the organization incurs no unnecessary expense; the work flows without delays; the organization is 100 percent compliant with all local, state, and federal laws; the organization meets (and, ideally, exceeds) all customer-defined requirements; and employees are safe and treated with respect. Value stream mapping is an important strategic tool for achieving outstanding performance on all fronts.

Assuming your organization is ready to benefit from value stream mapping's ability to align the organization, identify the important work to be done, and improve the customer experience, the first step is planning the activity, the subject of Chapter 2.

NOTES

1. John Krafcik, "Triumph of the Lean Production System," *Sloan Management Review* 30 (1), Fall 1988, pp. 41–52.
2. See W. Edwards Deming's *Out of the Crisis* (MIT Press, 2000) and Peter M. Senge's *The Fifth Discipline* (Doubleday, 1990).
3. Thinkexist, John Wolfgang von Goethe, http://thinkexist.com/quotes/ johann_wolfgang_von_goethe/.