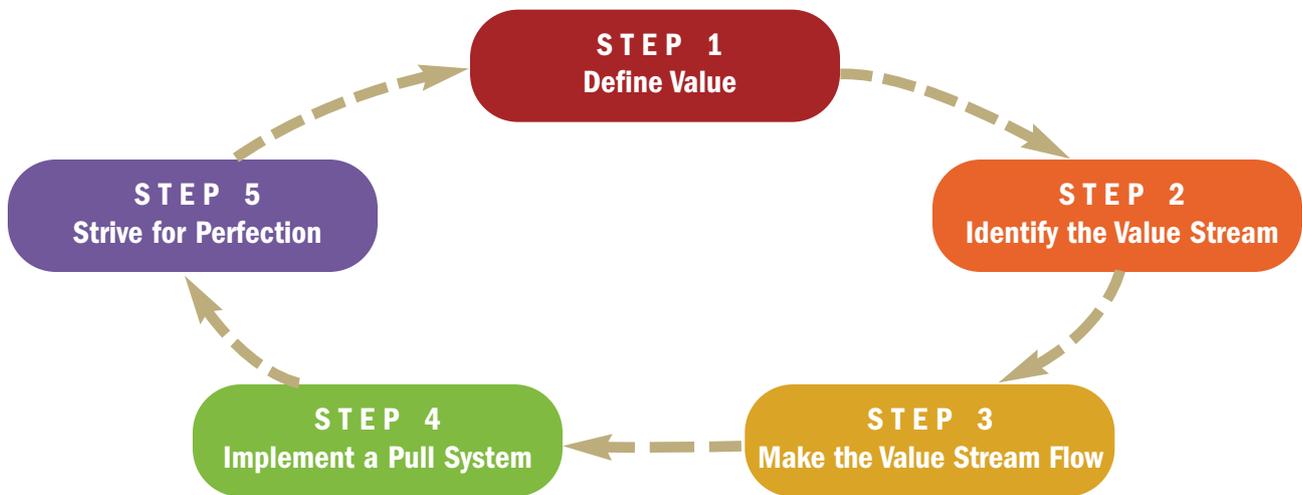


LEAN WHAT'S IT ALL ABOUT? ACCOUNTING

BY FRANCES A. KENNEDY, CPA, AND PETER C. BREWER, CPA

No, lean accounting has nothing to do with the South Beach Diet! Heck, you don't even need to count calories to become lean! But you *do* need to count what matters to the success of your business if you want to practice lean accounting. Though measuring what matters sounds intuitive, too many organizations are attempting to drive operational improvement with data that actually impedes the goals of improving customer satisfaction and financial results. Indeed, nonaccounting managers in numerous lean organizations across the globe would argue that their accountants are better off counting calories or carbohydrates rather than tracking performance indicators geared to the bygone era of mass production. The reason? Mass production metrics contradict lean thinking and often compel managers to make dysfunctional decisions.

Figure 1: THE LEAN THINKING MODEL



*Source: This figure was adapted from the lean thinking model created by James Womack and Daniel Jones in their 2003 book *Lean Thinking*, Free Press Publishing.

Lean thinking is about eliminating all forms of waste. To be a lean thinker, or a lean accountant for that matter, you must relentlessly seek to view your organization through the eyes of your customers. Sounds simple enough, right? Yet a closer look at most “customer-focused” companies reveals that their employees myopically optimize functional performance, which results in enterprise-wide waste and unhappy customers. And, yes, in case you are wondering, the accountants often lose sight of the customer as well.

Let’s take a look at one company’s experiences.

LEAN THINKING AT MIP

As the new millennium dawned, Midwest Industrial Products (MIP), a fictitious name for confidentiality purposes, didn’t have cause for celebration. Bloated inventories, excessive waste, disgruntled customers, and unsatisfactory financial results were the order of the day for this *Fortune* 500 U.S. manufacturing company. In an effort to right the ship, MIP adopted the principles of lean thinking featured in Figure 1.

The first step of lean thinking is to Define Value. During this step it’s critical to understand who’s doing the defining and what they are valuing. The customers are the ones who define what they value in specific products and/or services.

The second step is to Identify the Value Streams—all the value-added activities that go into delivering specific products and services to customers. Inevitably, these val-

ue streams span functional boundaries, thereby requiring employees to see how their organization functions from the customer’s viewpoint.

The third step, Make the Value Stream Flow, requires a departure from the mass production era approach of functionally organized batch-and-queue production that leads to inventory build-up, unsatisfactory order-to-delivery cycle times, and excessive rework and waste. Instead, lean uses cellular work arrangements that pull together people and equipment from physically separated and functionally specialized departments. The various pieces of equipment are sequenced in a manner that mirrors the steps of the manufacturing process, thereby enabling a continuous one-piece flow of production. Employees are cross-trained to perform all the steps within the cell.

The fourth step is to Implement a Pull System where customer demand dictates the production level. Visual controls are used to trigger upstream links in the value stream to initiate additional production. For example, when a point-of-use storage bin of component parts becomes empty, it automatically signals the upstream link in the value stream to replenish the parts without the need to prepare paperwork such as a materials requisition. Furthermore, establishing a takt time (the average production time allowed for each unit of demand), which is calculated by taking the total operating time available during a period and dividing it by the number of units demanded by the customer during that period, ensures that the pace of production remains in sync with customer demand.

The fifth step, Strive for Perfection, leverages the process knowledge of frontline workers. Rather than relying exclusively on management-level employees to generate ideas for improvement, management views all employees as intellectual assets capable of improving the flow of value to customers. To learn more about the principles of lean production, see Tom Greenwood, Marianne Bradford, and Brad Greene’s “Becoming a Lean Enterprise: A Tale of Two Firms” in the November 2002 *Strategic Finance*.

GET OUT OF THE WAY!

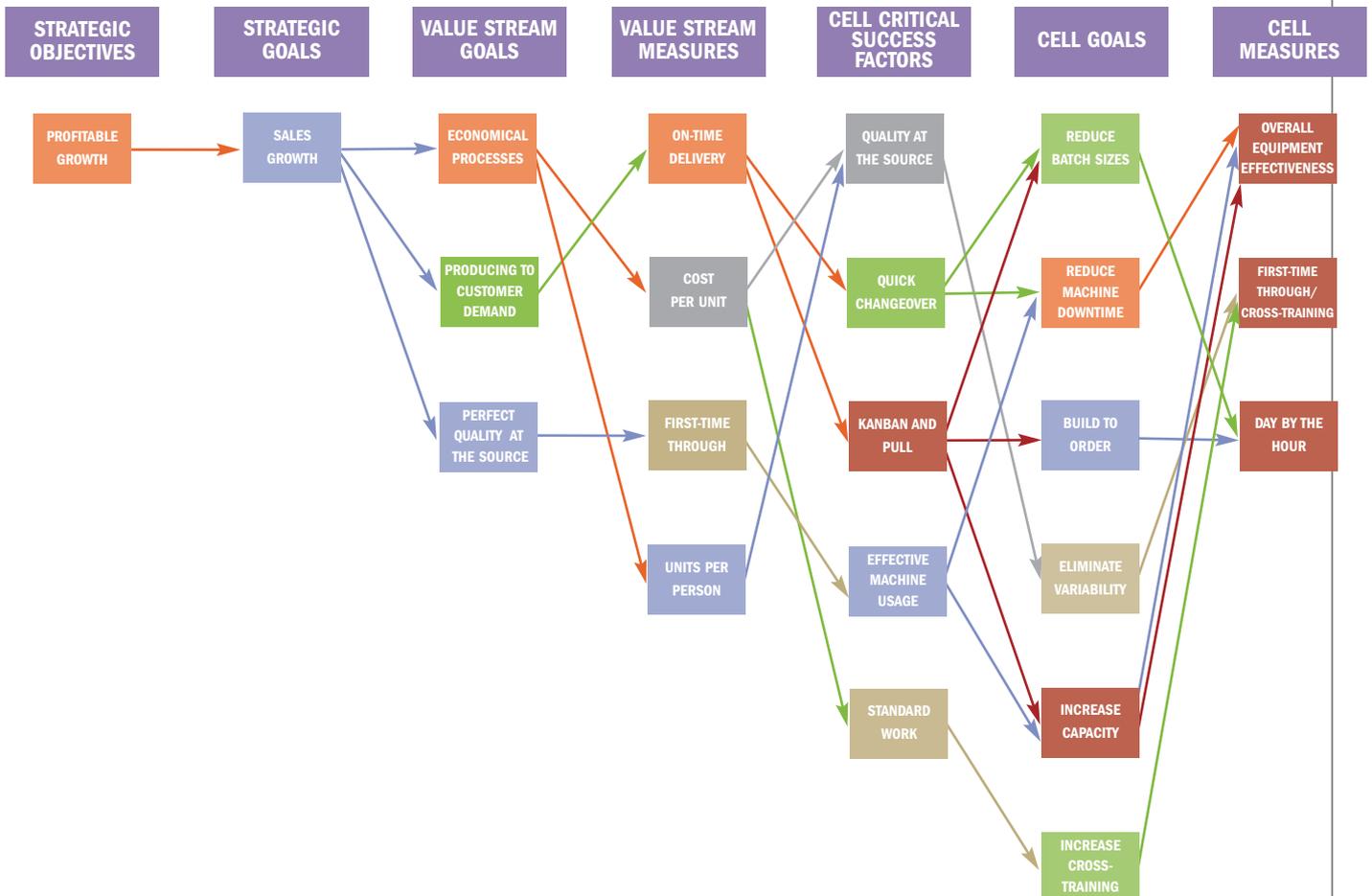
With the transition to lean production under way, the nonaccounting managers at MIP had one clear message for their colleagues in accounting—add value or get out of the way! Three sources of discontent were underlying this message. First, the accountants were relying heavily on variance data that they tabulated in conjunction with the monthly financial accounting cycle. Variance data tabulat-

ed on March 5—five days after the month-end close—was totally useless when it came to helping managers make real-time operational decisions on February 5.

Second, the accountants were providing data that motivated managers to make decisions that contradicted MIP’s lean production goals. For example, lot size variances and production volume variances motivated managers to maximize lot size and to keep workers busy making product to stock. Of course, these behaviors contradict the one-piece flow and make-to-order “pull” aspects of lean production where customer demand dictates the amount of production.

Third, the financial accountants were inaccurately characterizing the financial impact of operational improvements. Most notably, the absorption costing income statement, which treats direct materials, direct labor, and variable and fixed overhead as product costs and all selling and administrative expenses as period costs, penalized managers’ inventory-reduction efforts with a major hit to

Figure 2: LINKAGE BETWEEN STRATEGIC OBJECTIVES AND CELL MEASURES



the bottom line. The reason? In the illogical world of absorption costing, building up inventory increases income because of the fixed overhead deferral, while reducing inventory decreases income because of the need to expense previously deferred fixed overhead.

To make matters worse, the absorption costing income statement was unintelligible to operations managers and frontline workers. Thanks to the concepts of closing out variances and fixed overhead deferrals, MIP's operations managers were confused—and frustrated—by an absorption costing income statement that didn't reflect the economics of the lean business model.

ENTER LEAN ACCOUNTING

In an effort to respond to what the accountants viewed as fair criticisms from their counterparts in operations, MIP initiated a transition to lean accounting in May 2002 by forming two cross-functional blitz teams that included members from operations, purchasing, engineering, and accounting to design lean accounting practices for one

manufacturing cell. The cross-functional teams focused their efforts in four areas: (1) performance measurement, (2) transaction elimination, (3) calculating lean financial benefits, and (4) target costing.

Performance Measurement

Historical financial measures that focused on functional efficiency were no longer going to get the job done. Instead, the team sought to create a cohesive set of linked strategic objectives and goals, value stream goals and measures, and cell goals and measures. Figure 2 shows a subset of what the value stream team developed. The strategic objective of profitable growth links to the strategic goal of sales growth, which is a function of three value stream goals: economical processes, producing to customer demand, and perfect quality at the source. These three value stream goals link to on-time delivery, cost per unit, first-time through, and units-per-person measures. These value stream measures are improved by focusing on five critical success factors at the cell level, namely quality at the source, quick changeover, kanban and pull, effective machine usage, and standard work processes. Finally, the cell critical success factors link to the six cell goals and three cell measures as shown.

Notice that all measures link to the company's strategic objectives. In addition, frontline workers monitor the cell measures throughout the day to enable real-time response, and the operations managers monitor the value stream measures daily and weekly to drive the continuous improvement process.

Transaction Elimination

MIP's accountants realized that lean thinking applies to the information management side of the business as well as to making products. Therefore, as operations began to streamline its processes, the accounting department found that it was able to eliminate many of its transactions. For example, as materials requirements planning (MRP) was replaced with point-of-use visual controls (also called kanbans), material receipts were recorded by scanning bar codes rather than preparing receiving documents. As blanket purchase orders became more prevalent, the accountants authorized payment according to the terms of the purchase order when materials were received. This eliminated the need for accounts payable to perform the very time-consuming three-way match of purchase orders, invoices, and receiving documents that often required discrepancy investigation.

MIP has reduced 18 labor categories to two, which is

Table 1: VALUE STREAM COST ANALYSIS

	TOTALS	SALES & MARKETING	PRODUCTION CONTROL	MACHINING PARTS	QUALITY	ASSEMBLY	MFG. ENGINEERING	SHIPPING	MATERIAL HANDLING	PROD. ENGINEERING
EMPLOYEES										
Cost	\$48,743	\$11,000	\$5,899	\$9,100	\$2,600	\$4,550	\$8,576	\$2,275	\$1,950	\$2,793
Productive	27%	18%	8%	81%	0%	40%	10%	20%	0%	0%
Nonproductive	51%	60%	65%	16%	69%	25%	58%	42%	55%	76%
Other	5%	5%	5%	3%	6%	4%	6%	5%	5%	5%
Available Capacity	17%	17%	22%	0%	25%	31%	26%	33%	40%	19%
MACHINES										
Cost	\$20,548			\$15,000				\$3,000	\$2,548	
Productive	68%			71%				65%	55%	
Nonproductive	21%			20%				20%	24%	
Other	1%			0%				5%	6%	
Available Capacity	10%			9%				10%	15%	
Average Conversion Cost	\$109.64	\$17.41	\$9.33	\$38.13	\$4.11	\$7.20	\$13.57	\$8.35	\$7.12	\$4.42

resulting in fewer errors and quicker processing. Furthermore, senior management is considering compensating its labor force on a salary basis, thereby eliminating the need to track labor hours altogether. Because manufacturing variance reporting has been eliminated and the value stream teams are using weekly value stream statements to make management decisions, MIP is considering closing the books on a quarterly basis rather than a monthly basis.

Finally, as lean improvements have reduced inventory levels, cycle counts are becoming more accurate, and the time needed to perform these counts has declined. In fact, MIP believes it may be able to eliminate physical inventory counts altogether! Everything they need to verify inventory levels is readily in view.

Calculating Lean Financial Benefits

The team created two tools to quantify the financial ben-

efits of lean production. The first is a report called a value stream cost analysis that spans all functions directly involved in responding to customer orders for a particular product family. The second is an income statement format that complements lean production.

Value Stream Cost Analysis. Table 1 shows an example of a value stream cost analysis report. The top half of the report focuses on employees, and the bottom half focuses on machines. The table's top row shows employees' costs in total and for each link in the value stream. Employee time is broken down into four categories: productive, nonproductive, other, and available capacity. These four numbers sum to 100% for each column. So in Assembly, 40% of the employees' time is productively deployed, 25% is nonproductive, 4% is categorized as other, and 31% is currently idle. You interpret the data in the bottom portion of the table relating to the machines in the same fashion. The average conversion cost shown at the

Table 2: THE LEAN INCOME STATEMENT FORMAT

	VALUE STREAM #1	VALUE STREAM #2	SUSTAINING COSTS	TOTAL PLANT
Sales	\$1,500	\$2,500		\$4,000
Costs				
Material purchases	700	1,200		\$1,900
Personnel costs	100	200	125	425
Equipment-related costs	200	300		500
Occupancy costs	75	125	50	250
Total Costs	1,075	1,825	175	3,075
Value stream profit before inventory change	425	675	(175)	925
Decrease (Increase) in inventory	50	75		125
Value stream profit	375	600	(175)	800
Shipping costs			300	300
Corporate allocation			75	75
Net operating income	\$375	\$600	\$(550)	\$425
Return on sales	25%	24%		11%

* The numbers are assumed and are for illustrative purposes only.

* The Shipping Department has not been entirely incorporated into the value streams at this point in time.

bottom of each column is calculated by dividing the total costs incurred as shown in each column by the total number of salable units actually produced during the period. You can add material costs to this calculation's numerator to provide an actual average total cost per unit produced. If a particular value stream is characterized by product diversity, you can differentiate the costs assigned to products based on product features and characteristics. For simplicity, we won't explore this issue in detail.

The benefits of this report are that it:

1. Shows where and how productively costs are incurred,
2. Is easy to understand,
3. Highlights areas of waste,
4. Shows actual costs rather than standard costs,
5. Identifies bottlenecks, and
6. Highlights opportunities to manage capacity more effectively.

For MIP, the value stream cost analysis highlighted the fact that the transition to lean production reduced waste and increased the amount of idle capacity. Consistent with the philosophy of lean thinking, MIP sought to redeploy its newfound idle capacity to grow sales rather than to reduce available capacity by cutting heads.

Income Statement Format. MIP's traditional absorption costing income statement suffered from three limitations. First, it obscured the impact of changes in

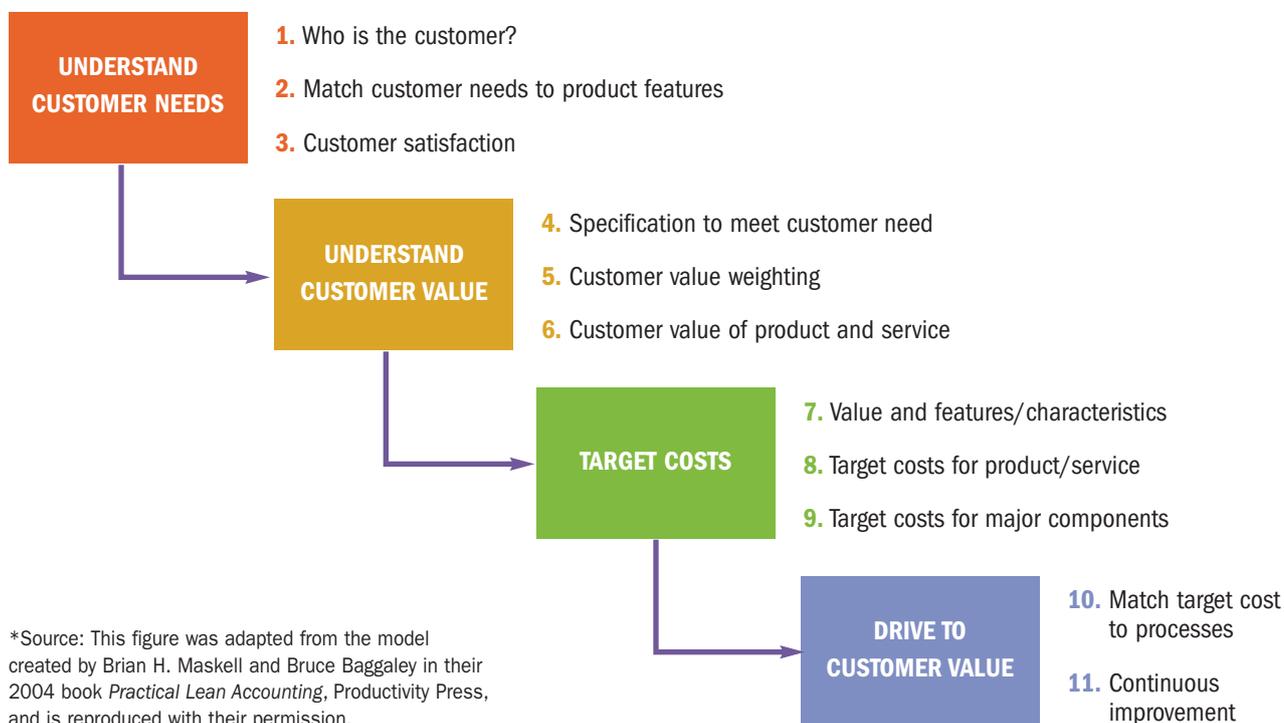
inventory on profits by burying the "inventory effect" in cost of goods sold. Second, it included adjustments to income resulting from the use of standard costing that confused nonaccounting personnel. Third, it didn't depict costs from a value stream perspective. The product- vs. period-cost distinction satisfied financial reporting requirements, but it didn't offer useful insights to operations personnel.

The lean income statement in Table 2 focuses on simplicity by attaching actual costs to each component of the value stream, isolating the impact of inventory fluctuations on profits, and separating organization-sustaining costs (costs that can't be traced to specific value streams) and corporate allocations from value stream profitability. Arbitrary cost allocations are avoided except in the case of occupancy costs, which are allocated to the value streams based on square footage to encourage minimizing space occupied. The profit for the total plant reconciles to the profit reported using an absorption format, but, unlike absorption costing, the underlying detail of the value stream statement is understandable to nonaccountants.

Target Costing

The lean team decided that traditional cost-plus pricing was no longer acceptable because it was based on the flawed assumption that customers would be willing to

Figure 3: TARGET COSTING



pay what MIP deemed appropriate based on its internal cost structure. MIP was taking its internal cost structure as a given and attempting to pass these costs on to customers rather than viewing its costs as a set of inputs that must be aligned profitably with the customer's expectations. Accordingly, the team turned its attention to target costing. The reason? Target costing is based on the premise that the pricing and continuous improvement processes begin by understanding customer needs.

As Figure 3 shows, MIP's target costing framework includes four main steps that break down into 11 smaller steps. The initial focus of the process clarifies customer needs and values followed by translating these insights into target costs that can drive the continuous improvement process.

While MIP's transition to lean accounting is certainly not complete, the accountants have initiated the process of becoming a value-added partner to the organization's operations managers. The results of this partnership have been impressive. By May 2004, inventory levels had declined by 52%, waste and rework had decreased by 41%, and the timeliness of customer deliveries had increased by 27%. Now, instead of pleading with the accountants to move aside, the message from the shop floor has changed to welcome aboard!

HOW DO I BEGIN?

Implementing lean thinking within the accounting function is a journey that takes thoughtful consideration. Although changes in accounting can't outpace those in manufacturing, they should follow closely. The first step is to assess where in the lean journey your facility resides. Has production converted to a one-piece pull system? Good. Then it's time to review performance metrics. Have you established value stream teams responsible for improvements? Good. Then it's time to look at value stream reporting. To assess your lean implementation progress read *Practical Lean Accounting* by Brian H. Maskell and Bruce Baggaley. It outlines a logical maturity process that matches accounting change with lean manufacturing changes (see a complete citation for this and other resources in "Resources at Your Fingertips" on p. 34).

The second step on the path to lean accounting is to fully understand the length of the journey. For example, what will your lean accounting income statement look like? What does your income statement look like now? What steps must you take to make the transition? Who will be responsible for the change? What resources will be needed? Perform this analysis for each change in information accumulation and reporting. Relentlessly ask yourself the questions: Is this transaction still needed?

RESOURCES AT YOUR FINGERTIPS

RESOURCE	DESCRIPTION
<i>Lean Thinking</i> by James Womack and Daniel Jones, Free Press Publishing, 2003.	Provides an in-depth look at lean principles and what it takes to achieve a responsive, customer-focused organization.
<i>Real Numbers: Management Accounting in a Lean Organization</i> by Jean Cunningham and Orest Fiume, Managing Times Press, 2003.	Introduces lean accounting concepts and discusses their impact on traditional reporting.
<i>Practical Lean Accounting</i> by Brian Maskell and Bruce Baggaley, Productivity Press, 2004.	Outlines step by step how to implement lean accounting, including a lean accounting assessment tool.
<i>Who's Counting?: A Lean Accounting Business Novel</i> by Jerrold Solomon, WCM Associates, 2003.	Chronicles the experiences of a plant controller as he gradually comes to understand why and how he and his department need to change.
<i>The Complete Lean Enterprise: Value Stream Mapping for Administrative and Office Processes</i> by Beau Keyte and Drew Locher, Productivity Press, 2004.	Describes how value stream maps can be created and used to improve administrative and office processes.

Does it add value to our business?

The third step is to schedule dates to review implementation progress. The reviews should take place often enough to reinforce accountability and to communicate the importance of the lean transformation—and far enough apart to not drain resources. Include all stakeholders in these meetings, including value stream and cell leaders as well as key employees from purchasing, human resources, engineering, and accounting. Keep all implementation team members informed and on board.

WHAT ABOUT SERVICE?

Lean thinking means identifying and eliminating waste in whatever form you find it. For manufacturers, such as MIP, it's easy to visualize the sources of waste—overproduction, waiting, defects, transportation, unnecessary inventory, unnecessary motion, and inappropriate processing. But how does waste manifest itself in a service business? The root cause often resides in the same type of functionally organized batch-and-queue processes that plague manufacturing. Hence, the logic of identifying value streams that span functional boundaries, building work processes that mirror those value streams, and using a pull approach to synchronize the level of output with customer demand is equally applicable to service businesses.

Functionally organized service companies often find that it takes a piece of paper numerous days to route through two offices in the same building! The process view inherent in lean thinking is likely to reveal that this

piece of paper could move through the system in minutes rather than days if you eliminate the time it spends sitting in somebody's inbox. Value stream maps are particularly useful in this type of situation. A "current state" map can be created that defines the flow of the current process and its performance levels. Then a "future state" map can be created to depict the desired flow of the process and its targeted performance levels. A modest number of specific improvement initiatives can be pinpointed on the "future state" map. Then a three-to-five-day improvement project, known as a kaizen event, can be scheduled and executed for each specific improvement initiative to make the "future state" map a reality.

Whether you work in service or manufacturing, lean thinking can help your company improve its operations. The accounting function can either impede lean thinking by continuing to provide counterproductive information, or it can make the transition to lean accounting. If your company is making the lean transition, you can make the accounting department a part of the lean team. ■

Frances A. Kennedy, CPA, is a professor of accounting in the School of Accountancy and Legal Studies at Clemson University. You can reach her at (864) 656-4712 or at fkenned@clemson.edu.

Peter C. Brewer, CPA, is a professor of accounting in the Department of Accountancy at Miami University. You can reach him at (513) 529-6271 or brewerpc@muohio.edu.