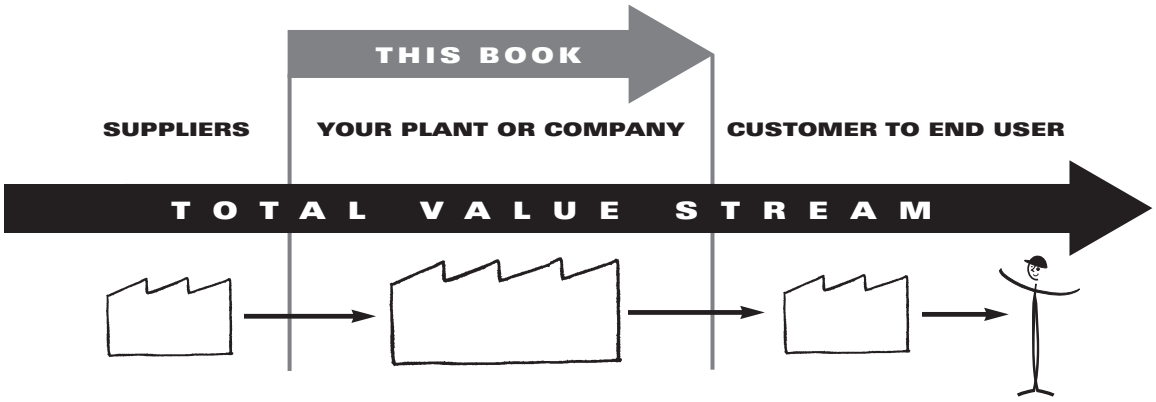
What is Value-Stream Mapping

"Value stream" may be a new phrase in your vocabulary. A value stream is all the actions (both value added and non-value added) currently required to bring a product through the main flows essential to every product: (1) the production flow from raw material into the arms of the customer, and (2) the design flow from concept to launch. This workbook looks at the production flow from customer demand back through raw material, which is the flow we usually relate to lean manufacturing and precisely the area where many have struggled to implement lean methods.

Taking a value stream perspective means working on the big picture, not just individual processes, and improving the whole, not just optimizing the parts. If you truly look at the whole and go all the way from molecules into the arms of the customer, you will need to follow the value stream for a product across many firms and even more facilities. But mapping this entire stream is too much for getting started!

This workbook covers the "door-to-door" production flow inside a plant, including shipment to the plant's customer and delivery of supplied parts and material, where you can design a future-state vision and start implementing it right away. This is a good level at which to begin your mapping and lean implementation effort.

As your lean experience and confidence grow you can expand outward, from the plant level toward the complete molecules-to-end-user map. Note, however, that in large companies when a product's value stream passes through more than one of your own facilities, expanding the mapping effort to include the flow through your other facilities should happen very quickly.



Value-stream mapping is a pencil and paper tool that helps you to see and understand the flow of material and information as a product makes its way through the value stream. What we mean by value-stream mapping is simple: Follow a product's production path from customer to supplier, and carefully draw a visual representation of every process in the material and information flow. Then ask a set of key questions and draw a "future-state" map of how value should flow.

Doing this over and over is the simplest way — and the best way we know — to teach yourself and your colleagues how to see value and, especially, the sources of waste.

WHY VALUE-STREAM MAPPING IS AN ESSENTIAL TOOL

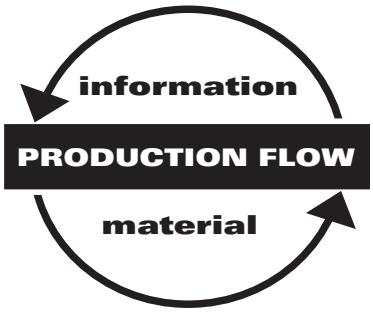
- **It helps you visualize more than just the single-process level, i.e. assembly, welding, etc., in production. You can see the flow.**
- **It helps you see more than waste. Mapping helps you see the sources of waste in your value stream.**
- **It provides a common language for talking about manufacturing processes.**
- **It makes decisions about the flow apparent, so you can discuss them. Otherwise, many details and decisions on your shop floor just happen by default.**
- **It ties together lean concepts and techniques, which helps you avoid "cherry picking".**
- **It forms the basis of an implementation plan. By helping you design how the whole door-to-door flow should operate — a missing piece in so many lean efforts — value-stream maps become a blueprint for lean implementation. Imagine trying to build a house without a blueprint!**
- **It shows the linkage between the information flow and the material flow. No other tool does this.**
- **It is much more useful than quantitative tools and layout diagrams that produce a tally of non-value-added steps, lead time, distance traveled, the amount of inventory, and so on. Value-stream mapping is a qualitative tool by which you describe in detail how your facility should operate in order to create flow. Numbers are good for creating a sense of urgency or as before/after measures. Value-stream mapping is good for describing what you are actually going to do to affect those numbers.**

Practice drawing value-stream maps and you will learn to see your shop floor in a way that supports lean manufacturing. Just remember that the point of getting lean is not "mapping," which is just a technique. What's important is implementing a value-adding flow. To create this flow you need a "vision" of the flow. Mapping helps you see and focus on flow with a vision of an ideal, or at least improved, state.

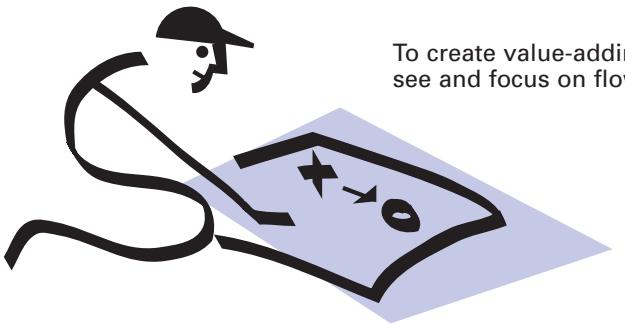
You shouldn't run out and map all your value streams right away. To benefit from value-stream mapping you should make use of it on the shop floor, mapping a value stream you will actually be implementing. If you are planning changes in a value stream, be sure to draw a future-state map first. If you are designing a new production process, first map a future state for the value stream. Considering a new scheduling system? Draw the future state first. Changing production managers? Use value-stream maps to help ensure an effective hand-off and continued implementation progress.

Material and Information Flows

Within the production flow, the movement of material through the factory is the flow that usually comes to mind. But there is another flow — of information — that tells each process what to make or do next. Material and information flow are two sides of the same coin. You must map both of them.



In lean manufacturing the information flow is treated with just as much importance as the material flow. Toyota and its suppliers may use the same basic material-conversion processes as mass producers, like stamping/welding/assembly, but Toyota plants regulate their production quite differently from mass producers. The question to ask yourself is, "How can we flow information so that one process will make only what the next process needs when it needs it?"



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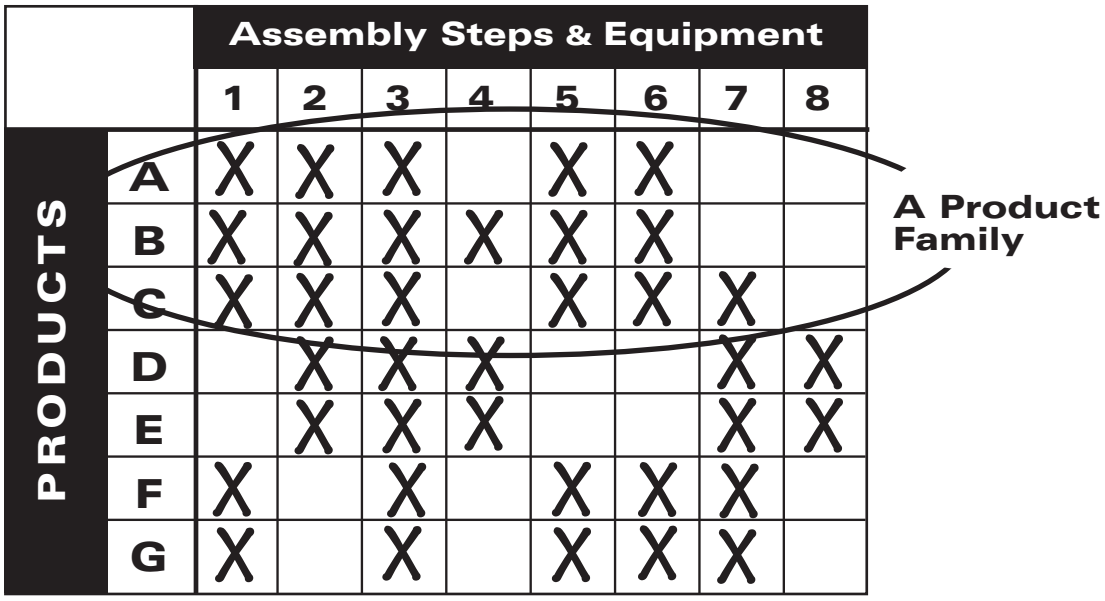
Selecting a Product Family

One point to understand clearly before starting is the need to focus on one product family. Your customers care about their specific products, not all your products. So you will not be mapping everything that goes through the shop floor. Unless you have a small, one-product plant, drawing all your product flows on one map is too complicated. Value-stream mapping means walking and drawing the processing steps (material and information) for one product family from door to door in your plant.

Identify your product families from the customer end of the value stream. A family is a group of products that pass through similar processing steps and over common equipment in your downstream processes. In general, you should not try to discern product families by looking at upstream fabrication steps, which may serve many product families in a batch mode. Write down clearly what your selected product family is, how many different finished part numbers there are in the family, how much is wanted by the customer, and how often.

Note:

If your product mix is complicated you can create a matrix with assembly steps and equipment on one axis, and your products on the other axis (see below).

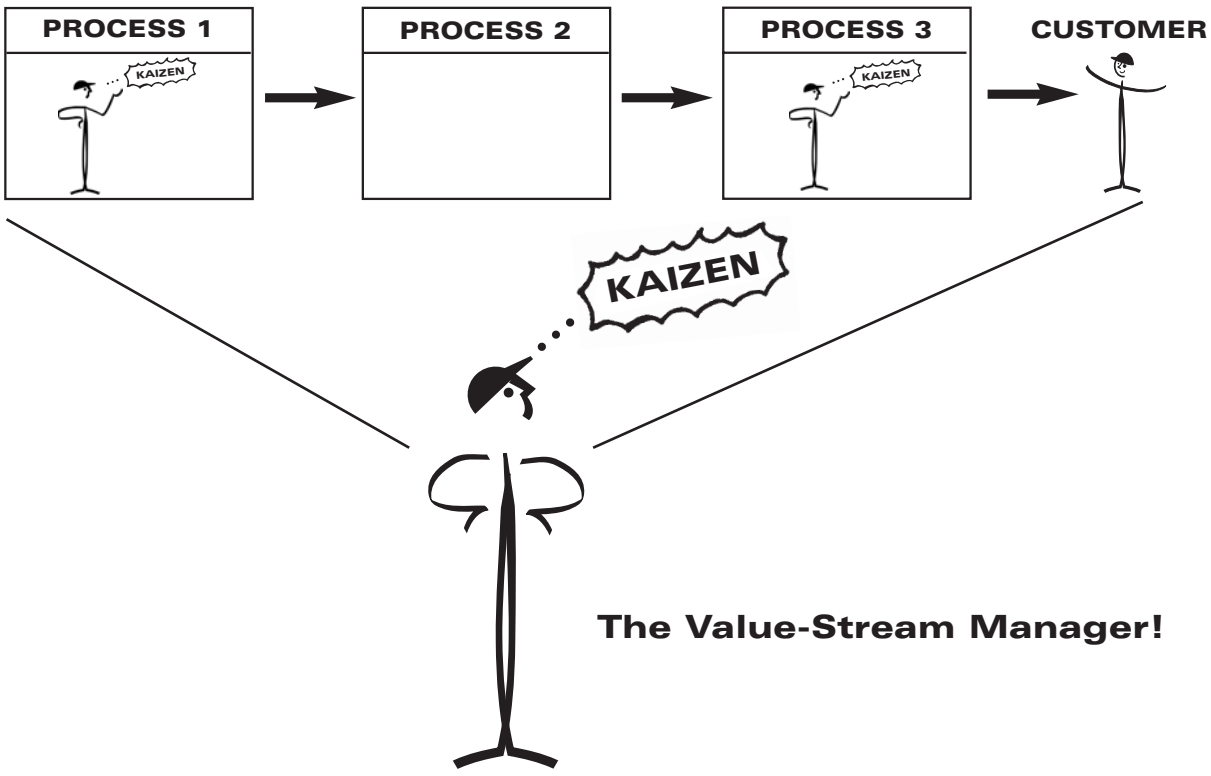


The Value-Stream Manager

You may have already noticed that tracing the value stream for a product family will take you across organizational boundaries in your company. Because companies tend to be organized by departments and functions, instead of by the flow of value-creating steps for product families, you often find that — surprise — no one is responsible for the value-stream perspective. (It's no wonder we have focused too heavily on process-level kaizen!) It is astoundingly rare to visit a facility and find one person who knows the entire material and information flow for a product (all processes and how each is scheduled). Yet without this, parts of the flow will be left to chance—meaning that individual processing areas will operate in a way that is optimum from their perspective, not the value-stream's perspective.

To get away from the isolated islands of functionality you need one person with lead responsibility for understanding a product family's value stream and improving it. We call this person a Value-Stream Manager, and suggest that in this capacity they report to the top person at your site. This way they will have the power necessary to help change happen.

Who is responsible for the Value Stream?



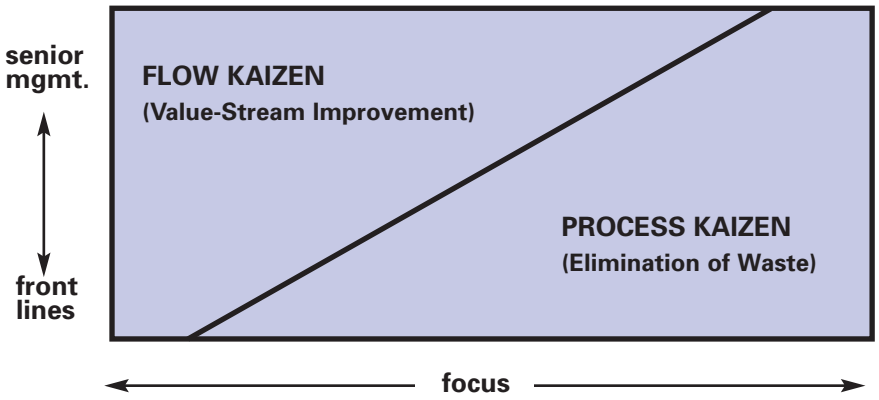
JOB DESCRIPTION FOR A VALUE-STREAM MANAGER

- **Reports lean implementation progress to the top person on site**
- **A line, not staff, person with the capability to make change happen across functional and departmental boundaries**
- **Leads the creation of the current-state and future-state value-stream maps and the implementation plan for getting from present to future**
- **Monitors all aspects of implementation**
- **Walks and checks the flow of the value stream daily or weekly**
- **Makes implementation a top priority**
- **Maintains and periodically updates the implementation plan**
- **Insists on being a hands-on person driven by results**

Many people get involved in lean implementation, and all need an understanding of value-stream mapping and the ability to read a future-state map. But the mapping and future-state implementation team needs to be led by someone who can see across the boundaries over which a product's value-stream flows and make change happen there. Value-stream improvement — "flow kaizen" — is management doing kaizen.

Do not make the mistake of splitting up the mapping task among area managers and then hope to stitch together their individual segments. Likewise, don't map your organization. Map the flow of products through your organization.

two kinds of kaizen



Note:

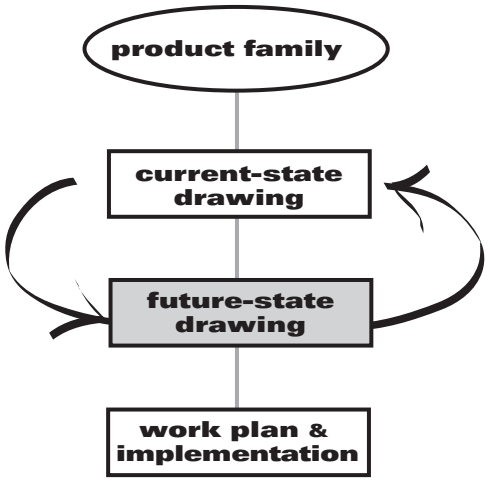
Both flow kaizen (value-stream improvement) and process-level kaizen (elimination of waste at the shop floor team level) are necessary in your company; improvement in one improves the other. Flow kaizen focuses on material and information flow (which require a high vantage point to see) and process kaizen focuses on people and process flow.

Using the Mapping Tool

Value-stream mapping can be a communication tool, a business planning tool, and a tool to manage your change process. Value-stream mapping is essentially a language and, as with any new language, the best way to learn mapping is to practice it formally at first, until you can use it instinctively.

Value-stream mapping initially follows the steps shown at right. Notice that "Future-State Drawing" is highlighted, because your goal is to design and introduce a lean value stream. A current state without a future state is not much use. The future-state map is most important.

The first step is drawing the current state, which is done by gathering information on the shop floor. This provides the information you need to develop a future state. Notice that the arrows between current and future state go both ways, indicating that development of the current and future states are overlapping efforts. Future-state ideas will come up as you are mapping the current state. Likewise, drawing your future state will often point out important current-state information you have overlooked.



Initial Value-Stream Mapping Steps

The final step is to prepare and begin actively using an implementation plan that describes, on one page, how you plan to achieve the future state. Then, as your future state becomes reality, a new future-state map should be drawn. That's continuous improvement at the value-stream level. There must always be a future-state map.

The beauty of this bureaucracy- and Powerpoint-free method is that your mapping and implementation team ends up with only a few sheets of paper (the future state and a plan to achieve it) that can transform your business!

Note:

Value-stream mapping for one product family should not take too much time. In about two days you should have a future-state map drawn to the point where implementation can begin. Don't get hung up trying to make all the details on your future-state map perfectly correct. Fine-tune your future-state map as implementation progresses.

SUMMARY - YOUR STARTING POINT

- Select a product family
- Have one person personally lead the mapping effort
- Begin at the “door-to-door” level
- Consider both the material and information flows