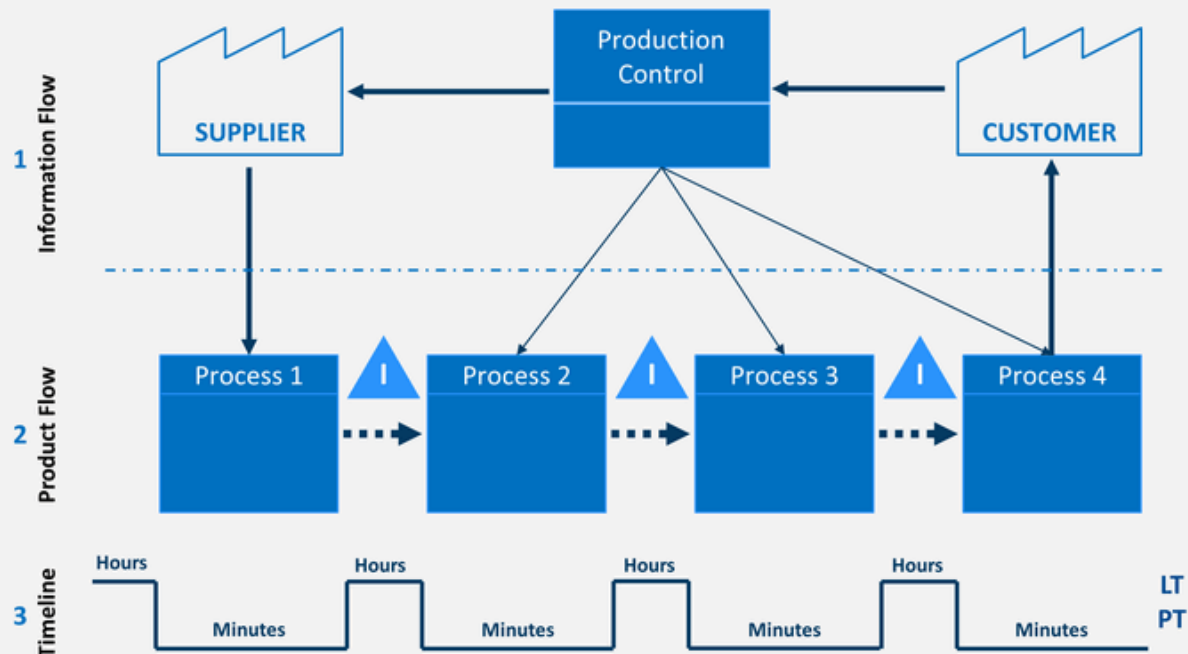


VALUE STREAM MAPPING

Key VSM Components



Value Stream Mapping for Operational Excellence in the Lab

Dr. Zachary J. Henneman

BASF Corporation, Union Assay Lab, Union, NJ, USA

Value Stream – What is it?

- “A value stream is all the steps (both value-added and non-value-added) in a process that the customer is willing to pay for in order to bring a product or service through the main flows essential to producing that product or service.”
- The critical phrase in this definition is, “*the customer is willing to pay for*”. If a company’s customer walked through its process, how would that customer react? Every process the customers sees involves work that adds value in their eyes.
- Unfortunately, every process the customers sees also involves work for which they are not willing to pay – waste. While no one can eliminate all waste, using value stream mapping to identify waste helps determine a plan for eliminating it.
- However, before a company can identify its value stream, it needs to determine:
 1. The value in the process that the customer is willing to pay for.
 2. The steps required to deliver the product or service to the customer.
 3. What is significant in each?

Three Steps in Understanding the Value Stream

- Create a list of products and group them in families.** Some companies offer varied products and services. It is relatively easy to group products into families by constructing a simple table, like the one below. The goal is not only to identify all product families, but also to identify what process steps each product utilizes.

Table: Grouping Products or Services Into Families				
Product/Service	Process Step 1	Process Step 2	Process Step 3	Process Steps 4, 5, 6...
A		x	x	
B	x	x		
C	x	x	x	

Product/Service	Process Step 1	Process Step 2	Process Step 3	Process Step 4	Process Step 5
Automotive Catalyst	Sample received; LIMS entry	XRF Prelim	Peroxide Fusion, Te- Collection	ICP-OES	Data approval
Chemical Catalyst	Sample received; LIMS entry	Wet Chem Prep	Gravimetric Assay	ICP-OES	Data approval

Three Steps in Understanding the Value Stream

- 2. Determine which product or service is considered primary.** While a product/service may utilize different processes, a company needs to concentrate on one process at a time, focusing on processes critical to company goals. In many instances, a company's improvement plans may be filled with process improvement projects with no clear link to its overall goals or vision. With limited resources available, efforts need to be concentrated only on those projects that really need to be done. Selecting which product family to analyze will depend on the individual business situation. Examples of products/services to analyze include those that:
- Stem from company goals/vision
 - Utilize the most process steps
 - Are known to have high defect rates
 - Represent the voice of the customer and offer the highest customer rate of return
 - Are high volume in dollars and/or units

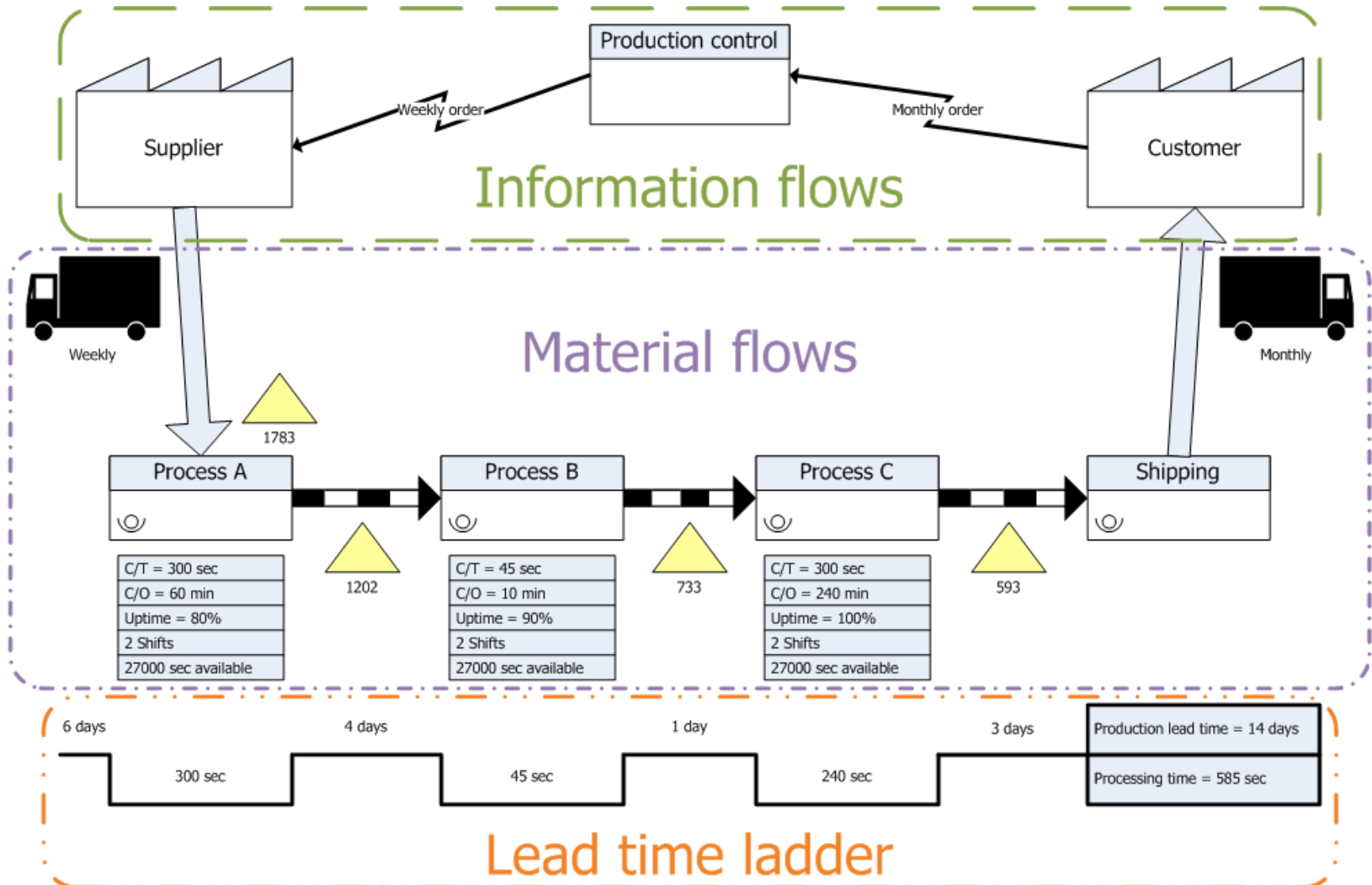
Three Steps in Understanding the Value Stream

- 3. Document the steps of the process – initial walk-through.** Use a SIPOC diagram (suppliers, inputs, process, output, customers) to document the process steps. Begin with the customers and work backward. A project team will gain more insight by working in reverse order. During the walk-through, think about the customer:
- How does the customer receive the product or service?
 - What triggers the product or service to be delivered to the customer?
 - What are the inputs? From where are these inputs supplied?
 - Once the walk-through is completed, there should be enough initial data to understand the value stream, and begin creating a current-state value stream map with a more detailed depiction of the value stream.

Value Stream Mapping

- A VSM (AKA end-to-end system map) takes into account not only the activity of the product, but the management and information systems that support the basic process. This is especially helpful when working to reduce cycle time, because you gain insight into the decision making flow in addition to the process flow.
- VSM helps companies avoid randomly making improvements by allowing them to identify and prioritize areas of improvement up front as well as to set measurable goals for improvement activities. This is accomplished through three stages:
 1. Create a current state map showing how the company serves its customers today.
 2. Create a future-state map showing the reduction of waste and the effects of the changes.
 3. Develop and implement a plan to reach the future state.

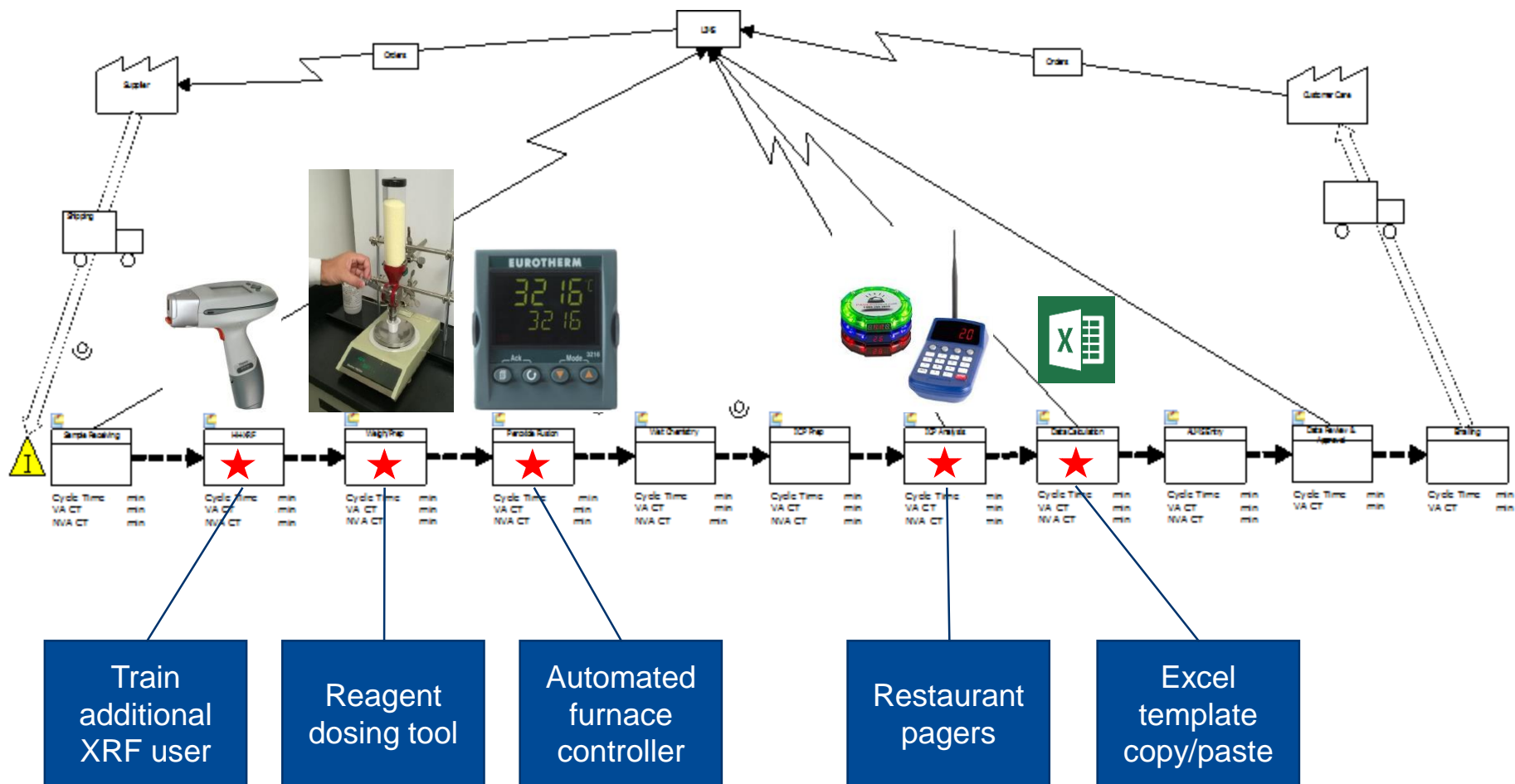
VSM Example



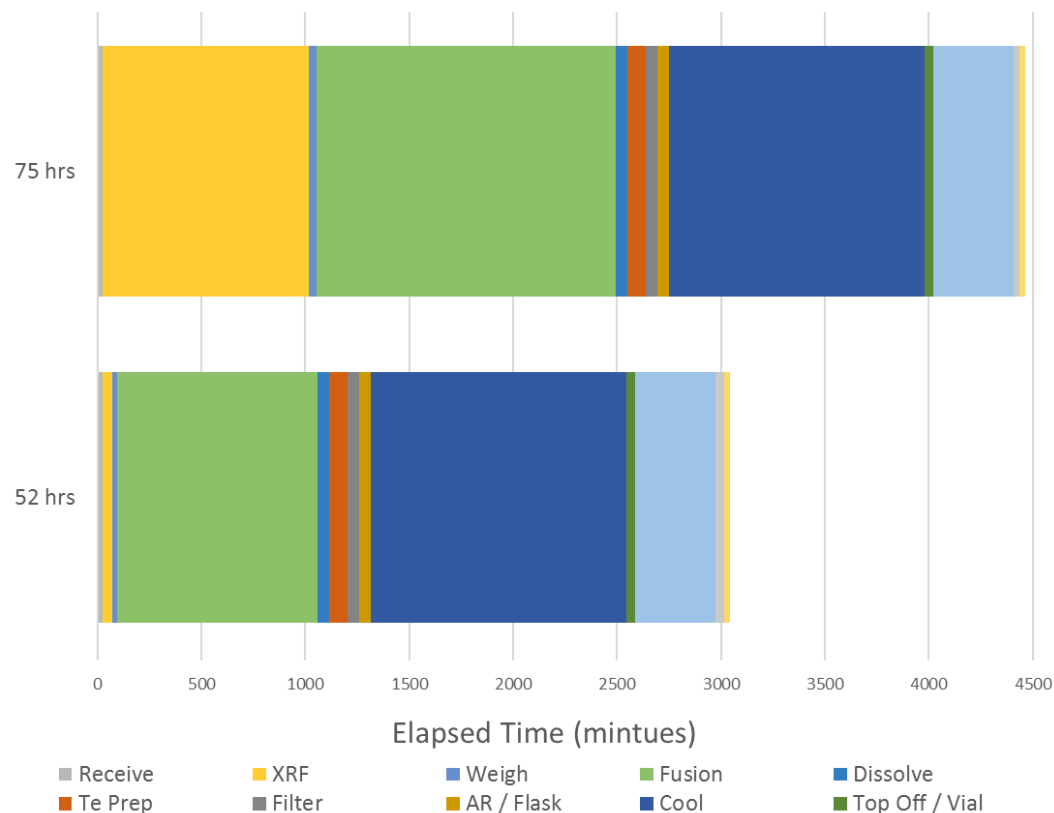
Example of VSM

- Project: Recycled Auto Catalyst Assays by Te-collection
 - ▶ Goal: Decrease cycle time to support business objectives
 - ▶ Target: Receipt of sample to completion of assay < 3 days, sustainably, without sacrificing accuracy or precision
- The Process
 - ▶ Define the products or services needed to complete the sample assay
 - ▶ Define the value stream
 - ▶ Map the value stream, complete an average time study
 - ▶ Debottleneck / improve efficiency of the VS
 - ▶ Capture current state versus future state velocity gains and cost savings

Recycled Auto Catalyst VSM Exercise



OPEX VSM Outcome



- Biggest gain was in training an additional XRF user.
- Automated furnace program saves chemists from checking on and manually adjusting the furnace; can be run unattended at the end of the day.
- Paging system eliminated unnecessary travels.
- Projected Savings:

Improvement	Cost	Calculated Savings
Peroxide dispenser	\$ 100	\$ 20,800
Furnace programmers	\$ 1,500	\$ 124,800
Paging system	\$ 500	\$ 62,400
Total	\$ 2,100	\$ 208,000

- Peroxide dispenser (5 min/day x 8 people)
- Furnace programmer (30 min/day x 8 people)
- Paging system (15 min/day x 8 people)

Conclusions

- Investing time into VSM has allowed our lab to:
 - ▶ Work smarter and more efficiently, eliminate waste
 - ▶ Free up time for R&D and methods development exercises
 - ▶ Remain headcount neutral with increased workload
 - ▶ Be more cost efficient - *“Many a mickle makes a muckle.”*

- Special thanks to:
 - ▶ BASF Union Lab OPEX Team
 - ▶ IPMI SAC

■ Contact information:

Dr. Zachary J. Henneman

Manager – RCC/CM Precious Metal Assay Services

BASF Corporation, 2655 US 22 West, Union, NJ 07083, USA

Phone: +1 908 624-7537

E-Mail: zachary.j.henneman@basf.com



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