

PMI®—Agile Certified Practitioner (PMI-ACP)®

Agile Value Stream Analysis



After completing this lesson, you will be able to:

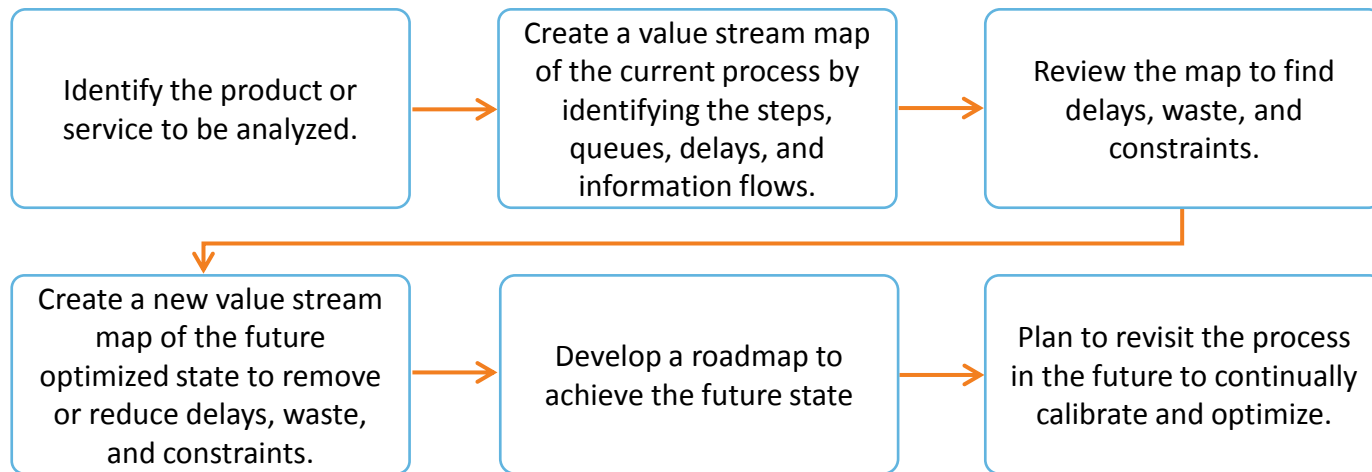
- Explain Agile value stream mapping
- Describe and use the various Agile flowchart symbols
- List the steps in creating Agile spaghetti diagrams



Value stream mapping is a technique used to analyze the flow of information, people, and material required to bring a product or service to a consumer.

- It is based on the concept of Lean manufacturing.
- It consists of a series of steps and activities classified as 'value adding' and 'non-value adding'.
- It is a key tool to identify and eliminate process waste and improve throughput.

Value stream mapping usually involves creating visual maps of the process (value stream maps) and progresses through the following stages:



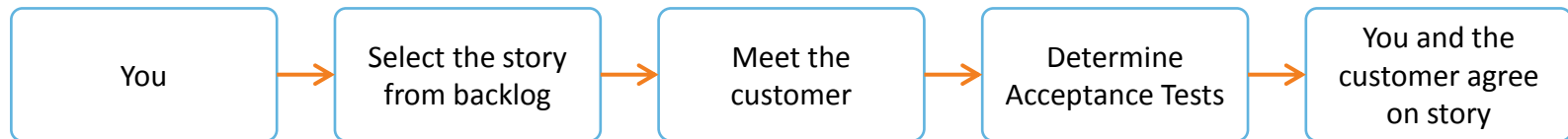
Value stream mapping entails several steps.

The first step is to identify the starting point of the process (who initiates it) and the end point (who gets the result) of the process.

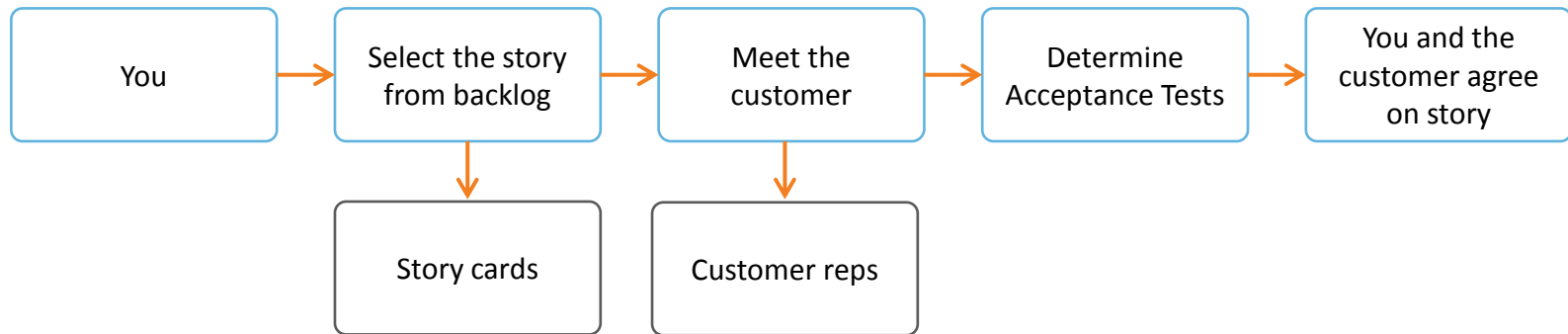
You

You and the
customer agree
on story

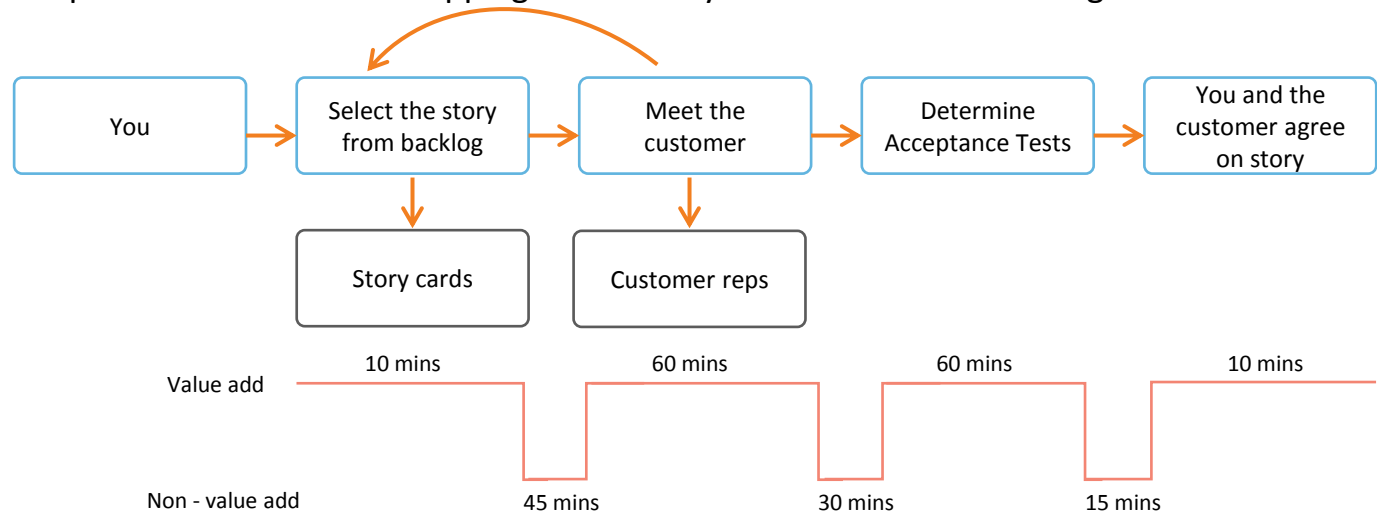
The second step in value stream mapping is to identify the high level steps, inventories, and queues through the process focusing on the primary flow.



The third step in value stream mapping is to identify any supporting groups and alternative flows, such as selecting another story if the customer representative is not available.



The next step in the value stream mapping is to classify activities as value adding and non-value adding.



Total Cycle time = Value Added + Non-value added time
Process Cycle Efficiency = $\frac{\text{Total Value Add Time}}{\text{Total Cycle Time}}$

Total Cycle Time = 230 mins
Total Process Efficiency = $\frac{140}{230} = 61\%$

Mapping Seven Wastes of Lean Manufacturing to Software

The Lean methodologies provide guidance on identifying waste in the manufacturing world. Mary Poppendieck has translated these for the software development activities.

Type of Waste	Description	Example
Partially done work	Work started, but not complete. Partially done work will lose its value over time	Code waiting for QA; Specs waiting for development
Extra processes	Extra work that does not add value	Unused documentation; Unnecessary approvals
Extra features	Features that are not required, or thought of as nice to have	Gold plating; Technology features
Task switching	Multitasking between multiple projects that has context switching penalties	People on multiple projects
Waiting	Delays waiting for reviews and approvals	Waiting for prototype reviews; Waiting for document approvals
Motion	The effort required to communicate or move information or deliverables from one group to another. If teams are not co-located, this can be higher	Distributed teams; Handoffs
Defects	Defective documents or software that needs correction	Requirements defects; Software bugs

An Agile flowchart is a useful tool for illustrating the process flow. A process is a set of activities with a defined 'trigger' or starting event that produces a specific output of value to a customer.





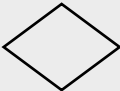
- Flowcharts are used for analyzing, designing, documenting, and managing a process or program in various fields.
- Flowcharts help uncover process gaps which contribute to waste, delays, and bottlenecks.



Agile flowcharts are also known as process flow chart, functional flow chart, process map, process chart, functional process chart, business process model, process model, process flow diagram, work flow diagram, and business flow diagram.

Flowchart Symbols

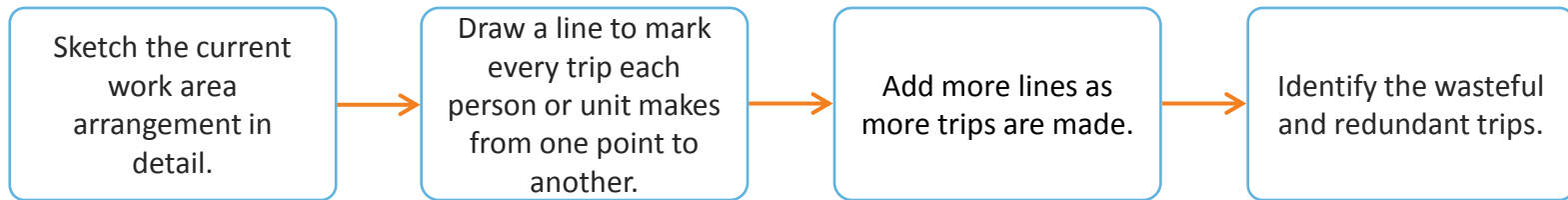
Various flow chart symbols and their uses are given below:

Name	Symbol	Use in flowchart
Oval		Denotes the beginning or end of a program.
Flow line		Denotes the direction of logic flow in a program.
Parallelogram		Denotes either an input or an output operation (e.g., Print).
Rectangle		Denotes a process to be carried out (e.g., Addition).
Diamond		Denotes a decision (or branch) to be made. The program should continue along one of the two routes (If/then/else).

Spaghetti diagram is a graphical tool that uses a continuous flow line, tracing the path of an item, or activity through a process.

- The continuous flow line enables process teams to identify redundancies in the work flow and opportunities to expedite process flow.
- Spaghetti diagram is also known as physical process flow, point-to-point flowchart, or workflow diagram.

The steps involved in creating a spaghetti diagram are as follows:



As more wasteful or redundant trips are made, the chart gets thicker with more lines.

The benefits of using spaghetti diagram are as follows:

- It identifies inefficiencies in area or plant layout.
- It identifies opportunities to reduce handling.
- It identifies opportunities for better workforce communication.
- It identifies resource allocation opportunities.
- It identifies opportunities for improvement of workplace safety.

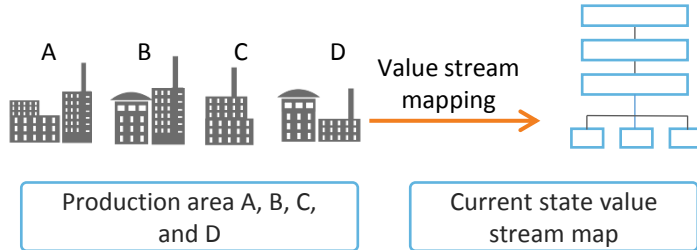
Harris Products Group, a subsidiary of publicly traded Lincoln Electric Co., produces a variety of products used in the metal brazing, cutting, and welding industries, and an array of gas-control equipment used in industrial, medical, and laboratory applications.

As a part of its continuous drive for improvement, Harris Products Group wanted to improve the preparation of chrome-plated components for assembly into its gas-pressure regulators.

Process Improvement Example—Solution

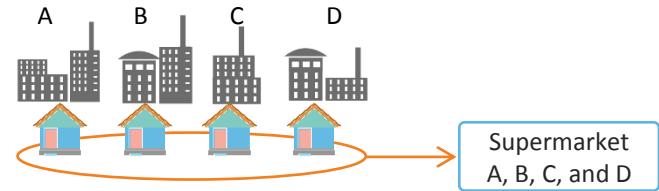
Bill Nusbaum, the Northeast Region Manager, and Tara Barrett, a Lean Services Product Manager for GaMEP, performed a value stream mapping analysis.

Analysis



The value stream mapping tool provides detailed information of the flow of materials through a production process. It helps to identify areas for improvement.

Implementation



- Supermarkets (locations in which a standard amount of inventory is stored) were established at various points along the production chain to ensure a steady flow of components through the production process.
- Supermarkets were restocked whenever they were running low on inventory.

After reorganizing the production process, Harris Products Group witnessed following improvements:

- For the past 18 months, there have been no instances of outages of components.
- There was a 75% reduction in WIP related to the components.
- The cash that was previously used in inventory was saved, leading to significant savings.



QUIZ 1

Which of the following diagrams can be used to show the flow of materials through various areas, departments, or physical spaces?

- a. Flowcharts
- b. Spaghetti diagrams
- c. SIPOC diagram
- d. Swimlane diagrams



QUIZ
1

Which of the following diagrams can be used to show the flow of materials through various areas, departments, or physical spaces?

- a. Flowcharts
- b. Spaghetti diagrams
- c. SIPOC diagram
- d. Swimlane diagrams



Answer: b.

Explanation: Spaghetti diagrams show the flow of materials through various areas, departments, or physical spaces. A SIPOC diagram is a high level process map that provides an overview the entire process, from supplier to customer. Swimlane diagrams are more useful for demonstrating roles and responsibilities.



QUIZ 2

Which of the following helps to determine the steps that add value to a process and the ones that do not?

- a. Flowchart
- b. Swimlanes
- c. Value stream map
- d. Spaghetti diagrams



QUIZ
2

Which of the following helps to determine the steps that add value to a process and the ones that do not?

- a. Flowchart
- b. Swimlanes
- c. Value stream map
- d. Spaghetti diagrams



Answer: c.

Explanation: Value stream map is a sophisticated flow charting method that uses symbols, metrics, and arrows to help visualize processes and track performance. This method helps determine which steps add value and which do not.



QUIZ

3

Process Cycle Efficiency is determined by _____.

- a. Total Value Added Time divided by Total Non-Value Added Time
- b. Total Value Added time minus Total Non-Value Added time divided by Total Cycle Time
- c. Total Value Add Time divided by Total Cycle Time
- d. Total Process Time divided by Total Value Added Time



QUIZ

3

Process Cycle Efficiency is determined by _____.

- a. Total Value Added Time divided by Total Non-Value Added Time
- b. Total Value Added time minus Total Non-Value Added time divided by Total Cycle Time
- c. Total Value Add Time divided by Total Cycle Time
- d. Total Process Time divided by Total Value Added Time



Answer: c.

Explanation: Process Cycle Efficiency = Total Value Add Time/ Total Cycle Time



QUIZ

4

Airline flight routes (maps) can be an example of which of the following diagrams?

- a. Flowchart
- b. Map
- c. Topographic sheets
- d. Spaghetti diagram



QUIZ

4

Airline flight routes (maps) can be an example of which of the following diagrams?

- a. Flowchart
- b. Map
- c. Topographic sheets
- d. Spaghetti diagram



Answer: d.

Explanation: Airline flight routes are a common example of Spaghetti diagrams.



QUIZ
5

What defines a process?

- a. A set of activities with a starting event and an output that creates value to a customer
- b. A sequence of events that must be followed to achieve a result
- c. A set of activities with a documented set of procedures
- d. A sequence of activities performed in a specific order



QUIZ

5

What defines a process?

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- c. A set of activities with a documented set of procedures
- d. A sequence of activities performed in a specific order



Answer: a.

Explanation: A set of activities with a starting event and an output that creates value to a customer.



Here is a quick recap of what was covered in this lesson:



- Value stream mapping is a technique used to analyze the flow of information, people, and material required to bring a product or service to a consumer.
- Value stream mapping is a key tool to identify and eliminate process waste and improve throughput.
- An Agile flowchart is useful for illustrating the process flow.
- Spaghetti diagram is a graphical tool that uses a continuous flow line, tracing the path of an item, or activity through a process.
- Spaghetti diagram gets thicker with more lines as more wasteful or redundant trips are made.



THANK YOU