

7. Process

Value Streams are the 'vehicle' for delivering value to customers. A Value Stream consists of steps that add value to the unit of work being processed. Each of these steps is executed in a certain way. Lean aims to continuously improve the way each of the steps is carried out, both individually and particularly as a chain of steps to be optimized. When work is not carried out correctly, or when the required value is not delivered, the first place we look to find the cause is in the value stream. The assumption is that the way the process was designed or carried out is the cause of the issue, and often is, especially in service industries like IT. The beauty of investigating the process is that it is the central entity that will almost inevitably lead us to the cause, even if we find that the design or execution of process is not at fault.

At any given moment in time, there is a best practice way to carry out the step or process as a whole. This process should be documented to ensure standardization which leads to a consistent level of quality of the output. The document describing this standardized way of working is known as a **Standard Operating Procedure (SOP)**. In this way, Lean aims to improve the value delivered to customers through standardization.

Within IT, we have a number of Value Streams such as delivering new functionality or ensuring that an IT service works. We also resolve incidents. This activity is based on failure demand rather than value demand. We therefore refer to the process for resolving incidents as a Failure Stream.

As we saw in the Lean principles, Value Stream was the second principle after Customer Value.

This underscores the importance of Value Streams, or processes, in the world of Lean. IT has been concerned with processes since the advent of ITIL® in the 1980's. As we saw in the Introduction, Lean IT takes a different approach to processes than the standard IT process frameworks.

Within Lean, processes are vital. They are the vehicles we use to deliver value to customers. For this reason, we refer to processes as Value Streams. The concepts are synonyms, only the use of the word Value indicates clearly what the intent is of the process. A Value Stream is a chain of specific and identifiable actions that lead to the creation of a product or service that has value for the recipient of the product or service.

The actions must be performed correctly in the right sequence at the correct time for value to be created and delivered. The actions must also be executed in succession so that delays between steps are minimal. In this case, the value stream has the characteristic of Flow, the third Lean principle. Our aim is also to start the value stream when a customer provides the trigger, also known as the fourth Lean principle of Pull.

Lean challenges us to look at processes from customer triggers to deliver the value. However, it is simply impractical to consider the entire chain of actions. We therefore need to be aware of the links between processes. This is done by being aware of the output of one process or action, which is then the input of the next process or action. A key skill here is to be able to define products or intermediate products rather than focus on the activities. Experience has shown that within IT, people

tend to talk about what needs to be done, rather than what needs to be created.

Before we dive into the details of Lean process analysis, let us acquaint ourselves with the most important elements of a process.

7.1 Process

Fundamentally, a process consists of input that is transformed to output through a series of actions. Input can be information, machinery, materials and labor or a combination of these inputs. Work is then done to create the desired output, being a product, service or information.

The output is always created for a clearly definable customer. If we cannot identify the customer, it is questionable as to whether we should carry out the process at all.

Every process has a goal and a predefined result. In order to ensure the process works correctly, we need to have people taking care of the activities. These people have roles and responsibilities. One of the responsibilities is to ensure the process works correctly. This is done by having process measures and controls to check how units of work are progressing through the process.

Let us quickly look at an example. Taking the IT process Request Fulfillment, we can define:

- **The Goal:** To answer requests for service, not being the resolution of disruptions, from customers regarding IT services
- **The Result:** Customers promptly receive the service they require
- **The Input:** A submitted request for service
- **The Output** is a fulfilled service request
- **The Transformation** will differ depending on the type of service request submitted.

Resetting a password requires a different set of actions than providing access to a new application.

- **Roles** may include a “password re-setter” as a role for a service desk agent, who has the responsibility of ensuring that passwords are reset as quickly as possible
- **Measures** may include a measurement of how many password resets are carried out per day and what the average time is that customers have to wait for their password reset.

It is important to understand each of these aspects of a process to ensure that when we aim to improve it, we do the right things. There will be more about that when we look at the tools for analyzing value streams.

7.2 Basic processes

At an abstract level, each organization has three processes: Design, Delivery and Support.

- **The Design Process** takes an idea from concept to the launch of a product or service
- This product or service must then be delivered to customers. **The Delivery Process** covers the activities from order intake to the delivery of the product to the customer
- During the lifecycle of the product or service use by the customer, the **Support Process** ensures that the customer continues to benefit from the value of the product or service

IT organizations obviously also have three similar processes: Product & Service Development, Production & Delivery and Service & Support:

- The **Product and Service Development Process** is concerned with the design of an IT service
- The **Production and Delivery Process** is all about ensuring the IT service is created and deployed

- **The Service and Support Process** is concerned with operating and supporting the deployed IT service

It is important to understand these different processes because within IT they can become intertwined. If we look at the process of delivering a change, often the production and delivery actions follow the development steps seamlessly, leading to a deployed service for which support may be required the moment it is in production. This is where understanding the links between processes is vital.

7.3 Push and Pull

We already mentioned that value streams should have the characteristic of pull, so what is the difference between a Push and a Pull system?

A **Push System** produces a product or service before the customer has actually ordered the product or service. The product is so-called “pushed” through the process. The key effect is that we produce to stock: Push processes always have inventory. In general, this pertains mostly final product but also work-in-progress. Push systems use a mechanism called Batch and Queue. We produce a certain number of products in one go and then store them in stock until the next step in the process takes place. Push production systems tend to work with forecast demand schedules rather than actual demand. This type of production always accentuates the bottlenecks in the system since each process step produces at maximum capacity. The process step with the lowest capacity will become the step with the greatest inventory preceding it.

A **Pull System** work differently. The value stream starts when the customer places an order. In effect, we let the customer pull the

product or service through production. The ultimate version of a pull system is Just-In-Time production in which inventory is brought into the process at the moment that it is needed in a value-adding step. In reality, most pull systems have small inventories to support the levelling of production. The ideal situation is that a single product is pulled through the process as and when the customer needs it. This is known as Single Piece Flow. In this situation, there will be no bottlenecks since each step in the process is capable of processing a single unit of work at a time.

We have covered the definitions and elements of processes and value streams, the various types of processes and the characteristics of value streams. The question now is: how can we analyze value streams? Within Lean IT, we use Value Stream Mapping. This is an instrument that consists of two tools: the SIPOC and the VSM.

7.4 SIPOC

Achieving the improvement of a value stream is done in two phases. In the first phase, we define the scope of the value stream we are aiming to improve. The second phase is all about detailing the value stream with the goal of implementing improvements.

Scoping a value stream starts with the elements we saw in the Customer module. Based on the Voice of the Customer and the related Critical to Quality tree, we can identify an area where the organization is not delivering the value required and the value stream most affected, and the stakeholders associated with this area.

In preparation for improving a value stream, we need to know who the customer is, what value

they are currently receiving and what the CTQ tree is associated to this particular customer value. We need to know what the customer thinks of its current performance. This is important because the perception may be good or even excellent, which would mean that we can better spend our time on improving a different value stream.

The next step is to define the boundaries of the value stream. We do this with the SIPOC tool, which is a method for scoping a value stream to be improved. Based on the input from key stakeholders, we assemble a team of people to investigate the value stream.

Using the **Supplier, Input, Process, Output and Customer (SIPOC) tool**, we can record the information related to this investigation. SIPOC stands for Supplier, Input, Process, Output, Customer. SIPOC is a method for scoping a value stream that needs to be improved. Assuming the CTQ and Voice of the Customer require us to improve the value stream, we can first identify the Output of the process and the Customer who receives the output.

We must then discuss the scope of the value stream with stakeholders since process boundaries are not always obvious. What will form part of the analysis, and what is explicitly not part of the analysis, should be confirmed with the stakeholders. A good place to start is to identify the goal and results of the process to be improved. Make sure this is clearly linked to the output of the process.

Based on the process, output and the customer, we should be able to identify the input and the supplier of the input. Each of the SIPOC entities may be adjusted as the value stream is analyzed. For example, the request fulfillment process that starts with a request

will be different from one that starts with an authorized request especially if, in both cases, the request needs to be authorized before it can be fulfilled.

Ensure all stakeholders directly related in the value stream are in some way involved in the Value Stream Mapping exercise. This is a precondition to ensure support for implementing the suggested improvements later on. Assuming the team aiming to improve the process has been able to identify the SIPOC components, the process steps can then be described. Generally, the aim is to describe the process in 3 to 5 high level steps. A guide for defining the steps is to identify handover moments; when does the process pass from one role to another?

The process of creating the SIPOC for the problem you wish to solve may take a number of iterations.

7.5 Value Stream Mapping

Value Stream Mapping (VSM) is an exercise to understand waste and improvement potential in a value stream. We use it to visualize the current and future states of a particular value stream. This visualization is used to facilitate the communication within the team improving the value stream and the stakeholders, such as other resources in the process or managers responsible for the process. The most important output of the Value Stream Map is to determine which improvement actions need to be implemented to achieve the desired future state.

The aim of the VSM analysis is to understand where the process fails to provide the value that the customer requires. Understanding these issues, gives us input for continuously