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LEAN SYSTEM PRINCIPLES

What is lean ?

This lecture introduces the following concepts:

- The principles of Lean Systems
- Muda / Waste in Systems
- Value
- Classifications of activities within a system:
 - Value Adding Activity
 - Non Value Adding Activity (essential and non-essential).

What is lean ?

Lean is a systematic approach
of eliminating “Waste”
so every step adds
“Value” for the Customer.

What is Waste AKA Muda?

**“Waste” or “Muda” is any activity that
consumes
time, resources or space,
but does “NOT”
add any “Value” to the product or service.**

What is value?

“Value” is a capability provided to a customer,
at the right time,
at an appropriate price,
as defined by the customer.

Cost

Quality

Service

History of Lean

So,

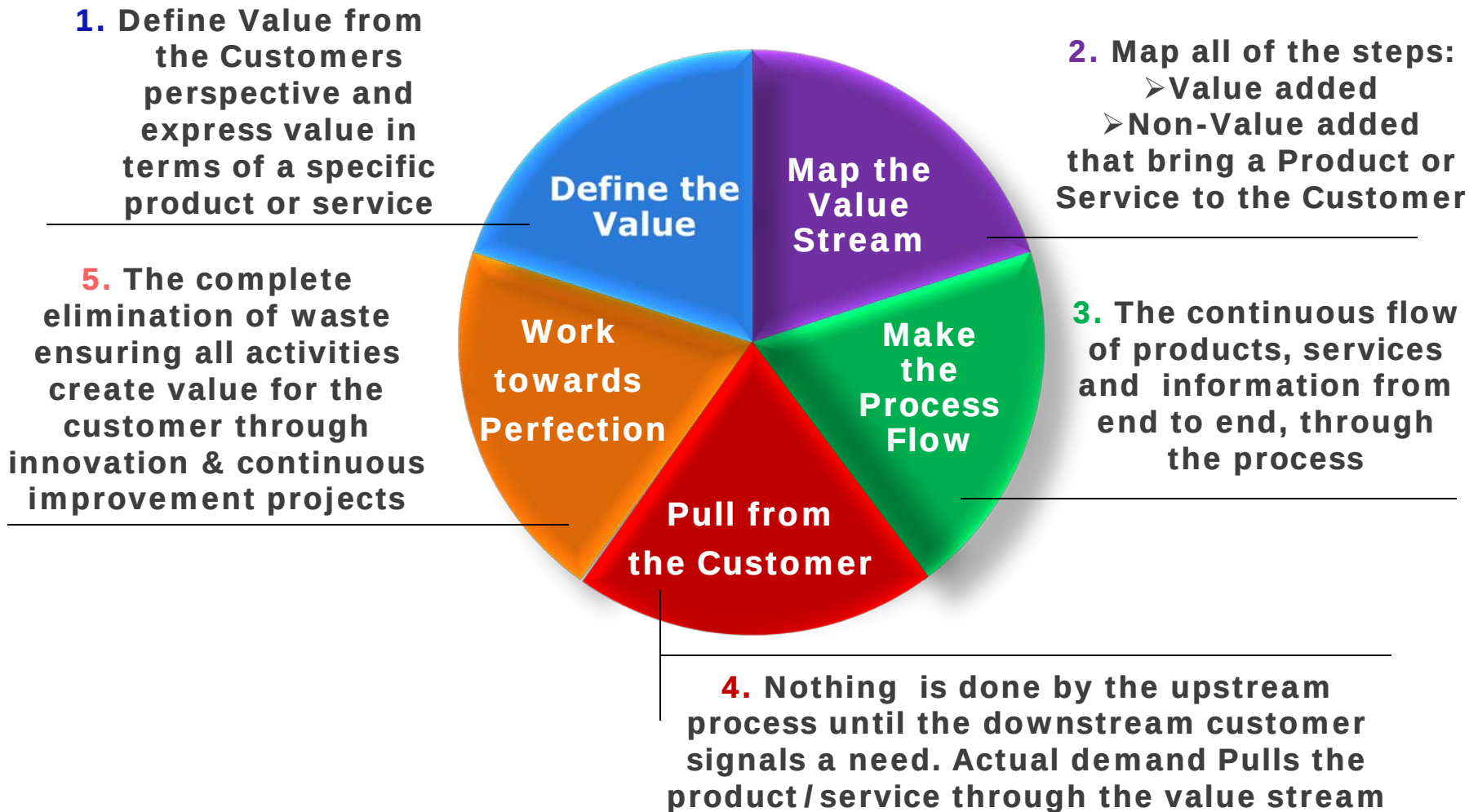
Where did lean come from?

https://www.youtube.com/watch?v=v2KN8CCfu_E

5 Principles of Lean (as defined by Womack on Jones)

- 1. Define the value** (*from the customer perspective*)
- 2. Map the value stream**
- 3. Make the process flow**
- 4. Pull from the customer**
- 5. Work toward perfection**

Lean Principles (as defined by Womack on Jones)



Value

It's value if the customer is willing to pay for it

Solutions provided at the right place and time

So...activities that add no value are waste (muda)



- Lean systems are developed by means of **incremental** and **continuous improvement**.
- These continuous improvement initiatives and projects are often labeled **Kaizen**

Let's look at this 'before and after'

<https://www.youtube.com/watch?v=UIGI3laGAo>

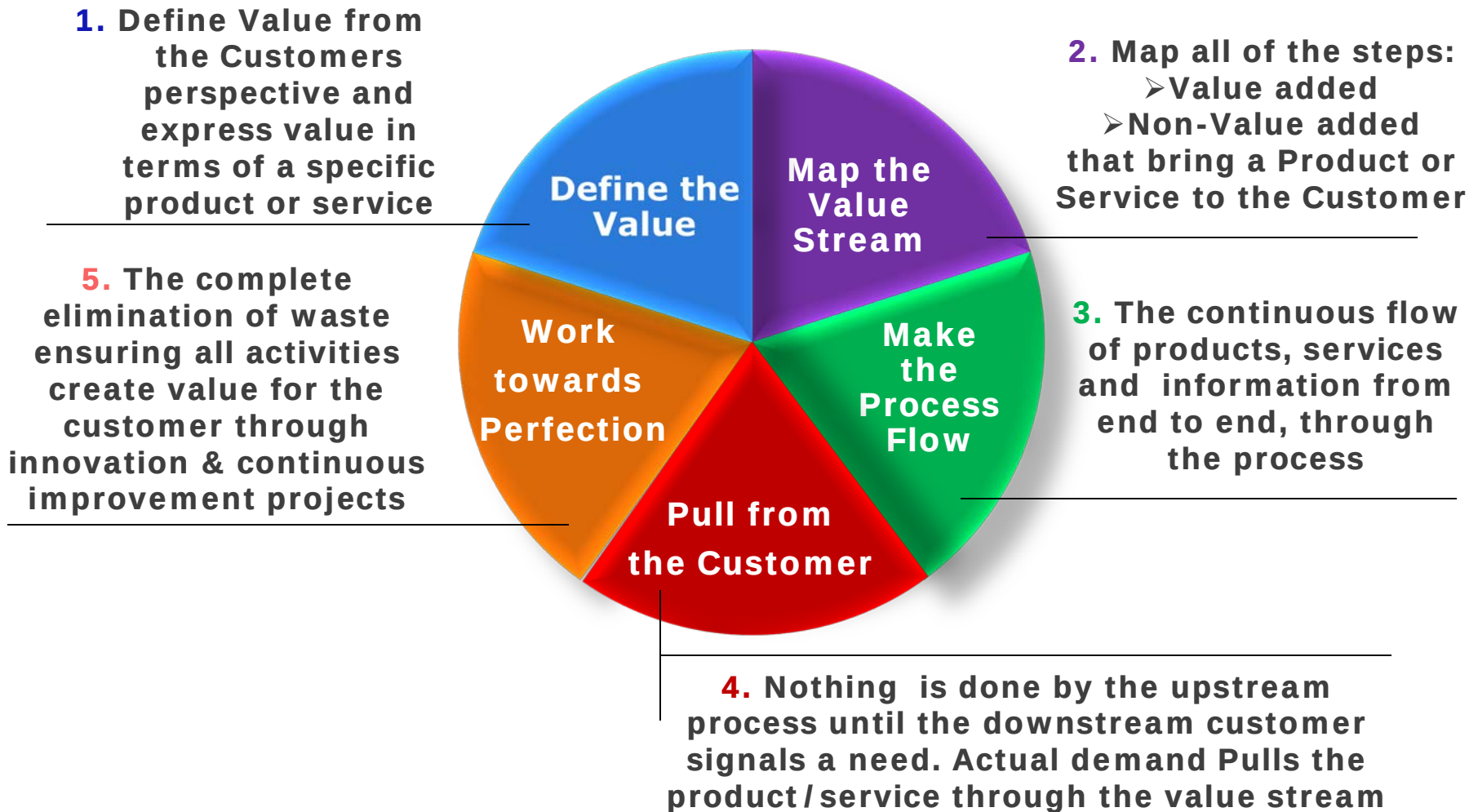
5 Principles of Lean

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An example of a very lean system...

<https://www.youtube.com/watch?v=8-DgmfMa5Zk>

Lean Principles (as defined by Womack on Jones)



The concept of Value

When a customer chooses a service or product, does he or she think much about cost?

Don't confuse **PRICE** with **COST**

- Selling Price = Cost + Profit
- Profit = Selling Price - Cost

VALUE should be (and is) defined by the customer / end user. Customers purchase products or services because they have a certain perceived/actual **value** to them.

The concept of Value

Value adding activity:

An activity is value added if (and only if) three conditions are met:

1. The customer must be willing to pay for the activity
2. The activity must change the product, making it closer to the end product that the customer wants and will pay
3. The activity must be done right the first time.

The concept of Value

A value added activity is one that either
(1) directly adds value to the final product or
(2) directly satisfies the customer

It is therefore an activity or a feature of the product that the client or customer is willing to pay for.

Value-added activities can be thought of as activities that change the **FORM**, **FIT**, or **FUNCTION** of the part and the customer is willing to pay for them.

The concept of Value

Some activities are **non-value adding**

It is therefore an activity or a feature of the product that the client or customer **would not willingly pay for.**

Non-value-added activities are activities that do NOT change the **FORM, FIT, or FUNCTION** of the part.

The concept of Value

Non Value Added (NVA) Activities:

These are activities that our customer does not want, but our current processes require them in order to complete the value added tasks.

Those NVA activities which can be reduced (but not eliminated altogether) are referred to as **ESSENTIAL NON-VALUE ADDING ACTIVITIES**. Those that can be eliminated (by changing the process/procedure or system) without negatively impacting on the **VA ACTIVITIES** are referred to as **NON-ESSENTIAL NON VALUE ADDING ACTIVITIES**.

It is not untypical to see the balance of VA and NVA activities in companies where Lean principles have not been adopted stand at:

- Value Added = 5%
- Non-Value Added = 95%

Further Reading:

Bicheno, J. and Holweg, M. (2009). *The lean toolbox*. 1st ed. Buckingham: PICSIE Books.

Jones, D. and Womack, J. (2014). *Lean thinking*. 1st ed. [Place of publication not identified]: Free Press.