

This is Lean

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General Ideas

- Lean focuses on adding value in companies
- Lean is about flow efficiency
- The customers' needs are always in focus
- Everyone should see and be responsible for the whole process
- An organization becomes lean through the process of improvement not a specific state

Flow efficiency:	<ul style="list-style-type: none">Focus on the time gap between having a need and satisfying it.Focus on the processed unit in the organization.High percentage of value-receiving time per time period.Attach people to work.Increasing the frequency of value-adding activities to the customer and reducing anything else <p>Improve Flow Efficiency by:</p> <ul style="list-style-type: none">Reducing the number of flow unitsWorking fasterIncreasing capacityEliminating Variation
Resource Efficiency:	<ul style="list-style-type: none">Focus on how much resources are utilized in a time period.High percentage of flatus-receiving time per time period.Attach work to people.
Opportunity Cost:	<ul style="list-style-type: none">The loss from not utilizing a resource to it's fullest.

Littles Law

- Throughput time** = flow units in process * cycle time
- Throughput is not only affected by the number of units but also by the time it takes to process
- e.g. choosing a shorter line at the grocery store does not necessarily lead to faster results. If the processing time on the other line is lower, it might be faster.

Law of Bottlenecks

Bottleneck:	A point in the process where a line forms
Variations:	Changing factors in the process (Resources, Flow Units, External Factors)

- Bottlenecks show themselves through queueing or starvation in certain stages of the process
- Bottlenecks result from variation in the process
- Bottlenecks are caused by variations

The efficiency paradox

- Focus on Resource efficiency rather than flow leads to secondary needs. These needs feel value-adding to work on but distract from actual efficient work.

Break down the customer's needs

- What** does the customer want?
- When** does he want it?
- What amount** does he want?

The 7 forms of waste

- Waste that should be reduced

Overproduction:	Producing more than the customer needs
Waiting:	Waiting time for workers or machines
Transportation:	Unnecessary movement of materials or products
Overprocessing:	Doing more work or using tools beyond what is needed
Inventory:	Excess stock tying up capital and hiding problems
Motion:	Unnecessary movement of workers
Defects:	Producing faulty parts

Robust and Fragile Systems

Fragile:	Low inventory, low buffers, simple technology
Robust:	High inventory, high buffers, complex technology

The Toyota Production System (TPS)

4 Core Principles	3 Levels of Capabilities	DNA of the TPS	Continuous Improvement
1. Teamwork 2. Communication 3. Waste Reduction 4. Continuous Improvement (Kaizen)	1. Routine in manufacturing 2. Routine in learning 3. Routine in evolution	1. Define all work in content, sequence, timing and outcome 2. Keep connections direct and clear. (Yes or No) 3. Use simple, direct paths. 4. Improve scientifically at the lowest level.	1. Challenge: a long term vision that is challenging 2. Kaizen: commitment to continuous improvement 3. Genchi Genbutsu: Go to the source and find the facts

Definition of Lean in different layers of abstraction

The acceptance of lean in an organization is dependent on the presentation and what is needed

- A philosophy, culture, values, way of living/thinking
- A way to improve, a quality/production system
- A metho/tool to eliminate waste

The efficiency Matrix

- An organization can only be resource efficient and flow efficient to a certain degree
- Both cannot be reached perfectly at the same time
- There needs to be a compromise to low and resource efficiency
- Variation reduces the max. amount of efficiency possible

A Lean operations Strategy

Values:	How to act in every situation
Principles:	What to prioritize <ol style="list-style-type: none">Just-in-time: creating flow for delivering what, when and how much the customer wantsJidoka: Giving the people the tools and permission to act on the process (like stopping production)
Methods:	How to do certain tasks <ul style="list-style-type: none">Identify, standardize and spread the best way to do things
Tools & Activities:	Every type of tool and activity involved in the daily work <ul style="list-style-type: none">e.g. A3 Template to document standards for problems