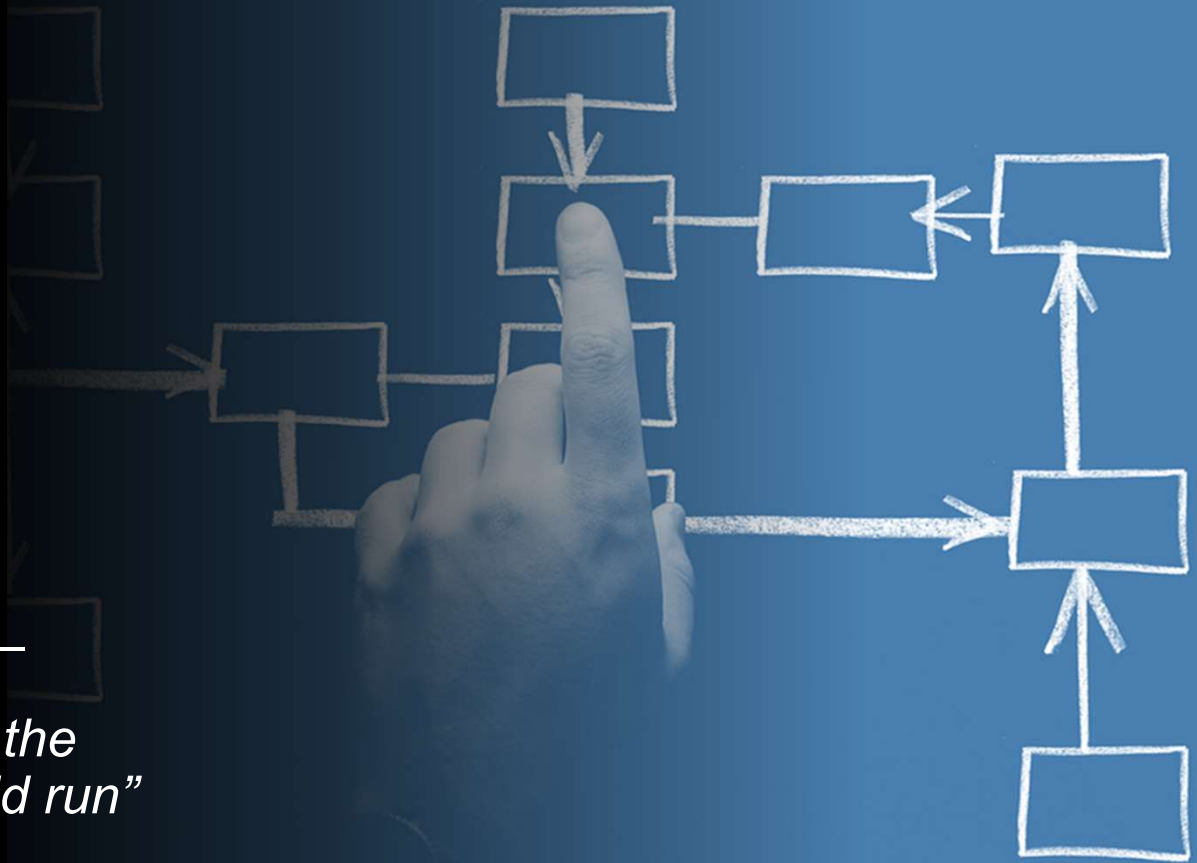




Operations Management MLI21C617

“Operations may not run the world, but it makes the world run”

Lecturer: Misa Bakajic



Spring 2024

Password: Vernon

Group Assignment 1

Some areas which were well done:

- Quality was high over all
- Every group understood the assignment well
- Application of theory was high overall

Areas where points were deducted:

- document layout (only if it was confusing)
- backing up claims (calculations, references, etc.)
- Some diagrams were overly complex
- more course theory connections could be added

Average grade was: 13

Signaling assignment quality with document layout

Left side of the room

Download Assignment Example A on Mycourses

Download Assignment Example B on Mycourses

Right side of the room

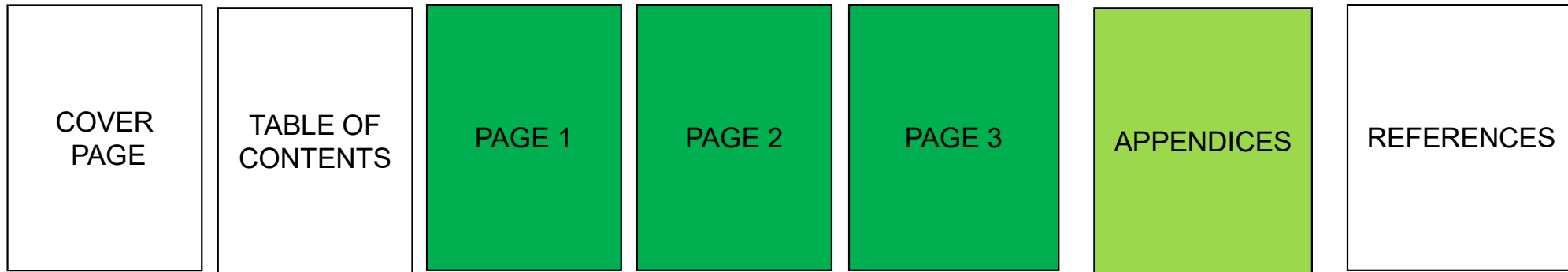
Download Assignment Example B on Mycourses

Download Assignment Example A on Mycourses

Instructions: Take 2 minutes give a grade between 1-10 for two assignments



Expected components of an assignment



Document Sections

- Cover page
- Table of contents
- Assignment text
- Appendices
- References



Recap

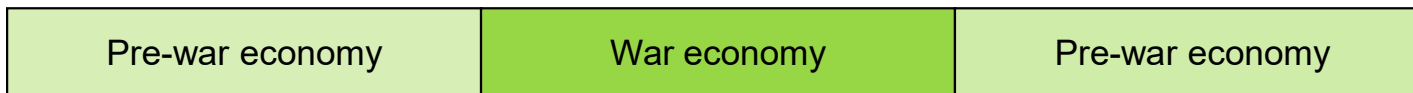
1. Operations management is all about managing variability
2. Theory of constraints focuses on “the system” rather than a single process
3. Quality is a key concept in operations management

A!

LECTURE 6 Improving Operations

A!

Operations evolution in the 20th century



American Manufacturing Output during WW2 (1939 = 100)

	1940	1941	1942	1943	1944
Aircraft	245	630	1706	2842	2805
Munitions	140	423	2167	3803	2033
Shipbuilding	159	375	1091	1815	1710
Aluminum	126	189	318	561	474
Rubber	109	144	152	202	206
Steel	131	171	190	202	197

Source: Milward, 69.



Alignment between national strategy and manufacturing

Macro Perspective

Establish manufacturing objectives and allocate resources
WHAT NEEDS TO BE DONE?

Meso Perspective

Plan and coordinate manufacturing efforts across the country
WHERE WILL IT BE DONE?

Micro Perspective

Increase factory output by adopting new machines and processes
HOW IT WILL BE DONE?



Lean/JIT originates in the 1950s



Eiji Toyoda



Taiichi Ohno

Toyota and the whole Japan had issues after the war

- Lack of capital and resources, small home market, strict labor laws

Toyoda and Ohno visit Ford's production in 1950

- Ford had a "move the metal" -mentality (high rework and waste)
- Highly capital-intensive and inflexible production system
 - High demand (=revenues) in the US enabled the investments

They conclude operations model inappropriate for Toyota

The only way to compete would be to use more flexible machinery, which would make smaller production lots economically viable

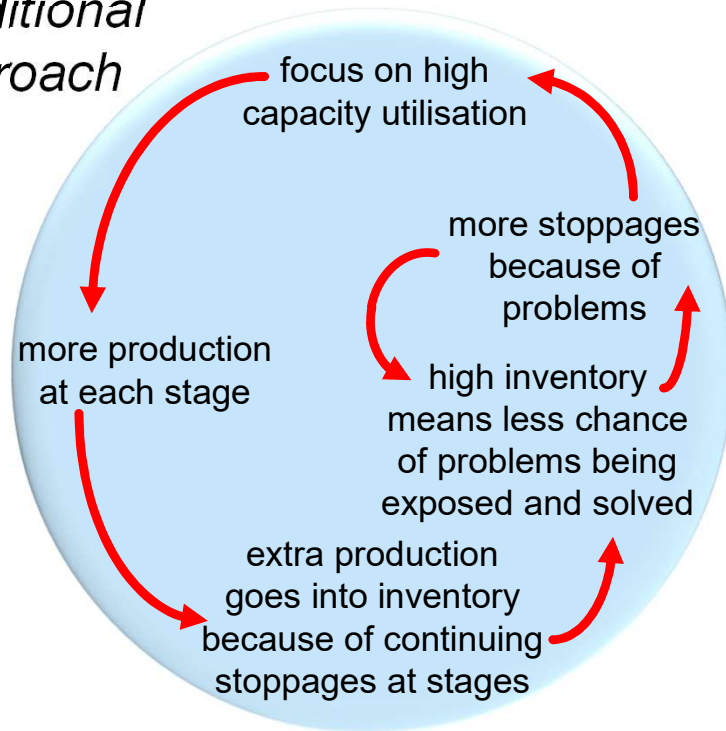
Flexibility requires reducing set-up times and costs & constant development of operations (reduction of waste)

They decide the first priority of production should be removal of waste

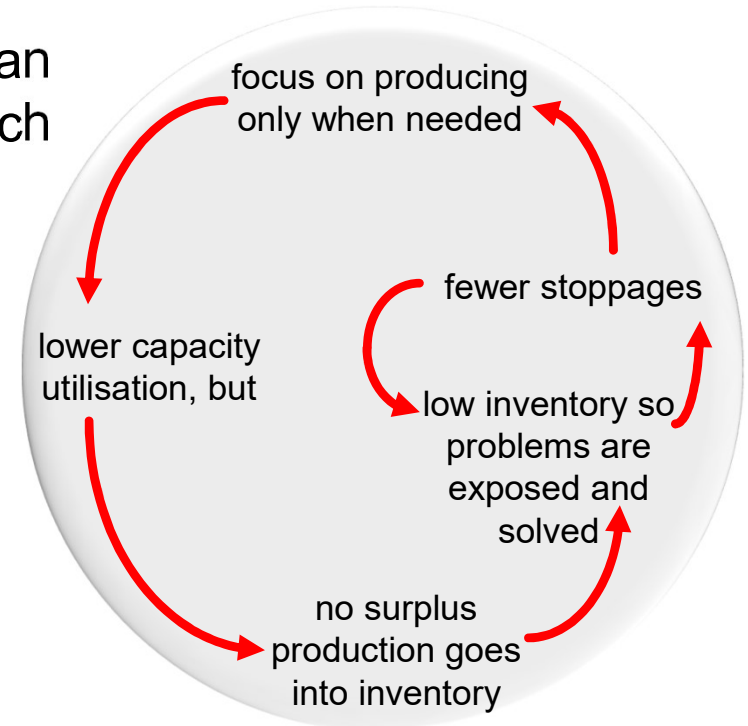
High inventory is seen as most visible result of waste, it hides other problems

Lean synchronization

Traditional approach

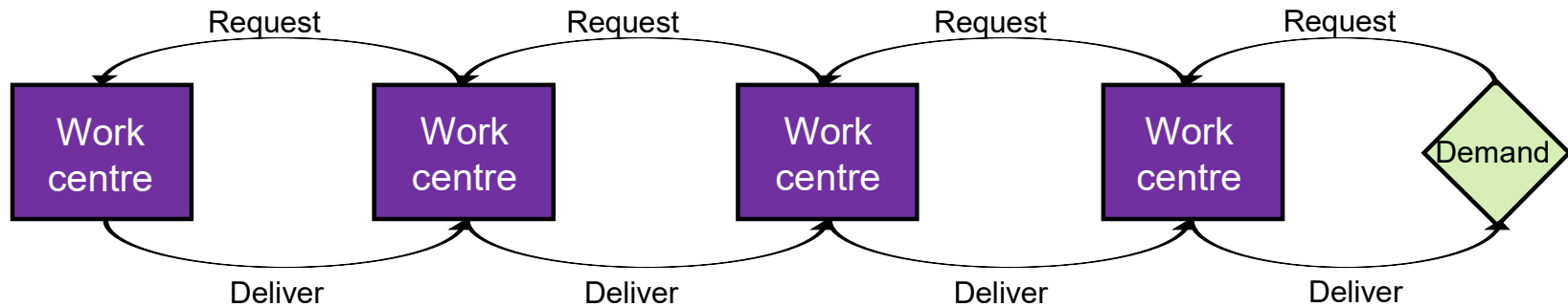
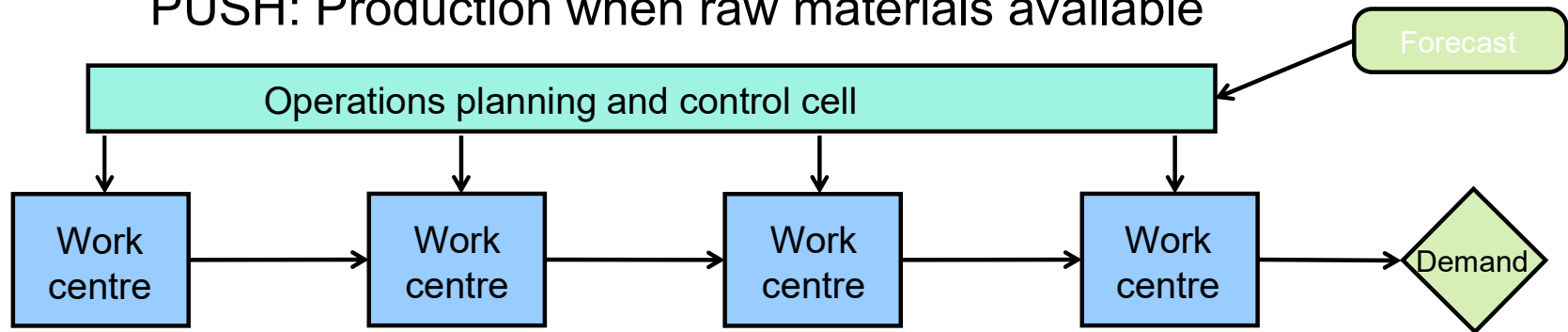


Lean approach



Pull control for lean operations

PUSH: Production when raw materials available



Kanban cards

JIT (just-in-time) planning and control is based on the idea that each process step has knowledge on

- a) when to produce a particular batch
- b) when the batch will be moved to the next step



Kanban cards

(a particular order card)



Benefits of using Kanban

A simple and easy technique

Production based on end demand

- Can be amended by $\pm 10\%$

Oversees the whole production

- No over-production or inventories

Issues in production are revealed immediately

- Won't stay at the inventories waiting to be found later on

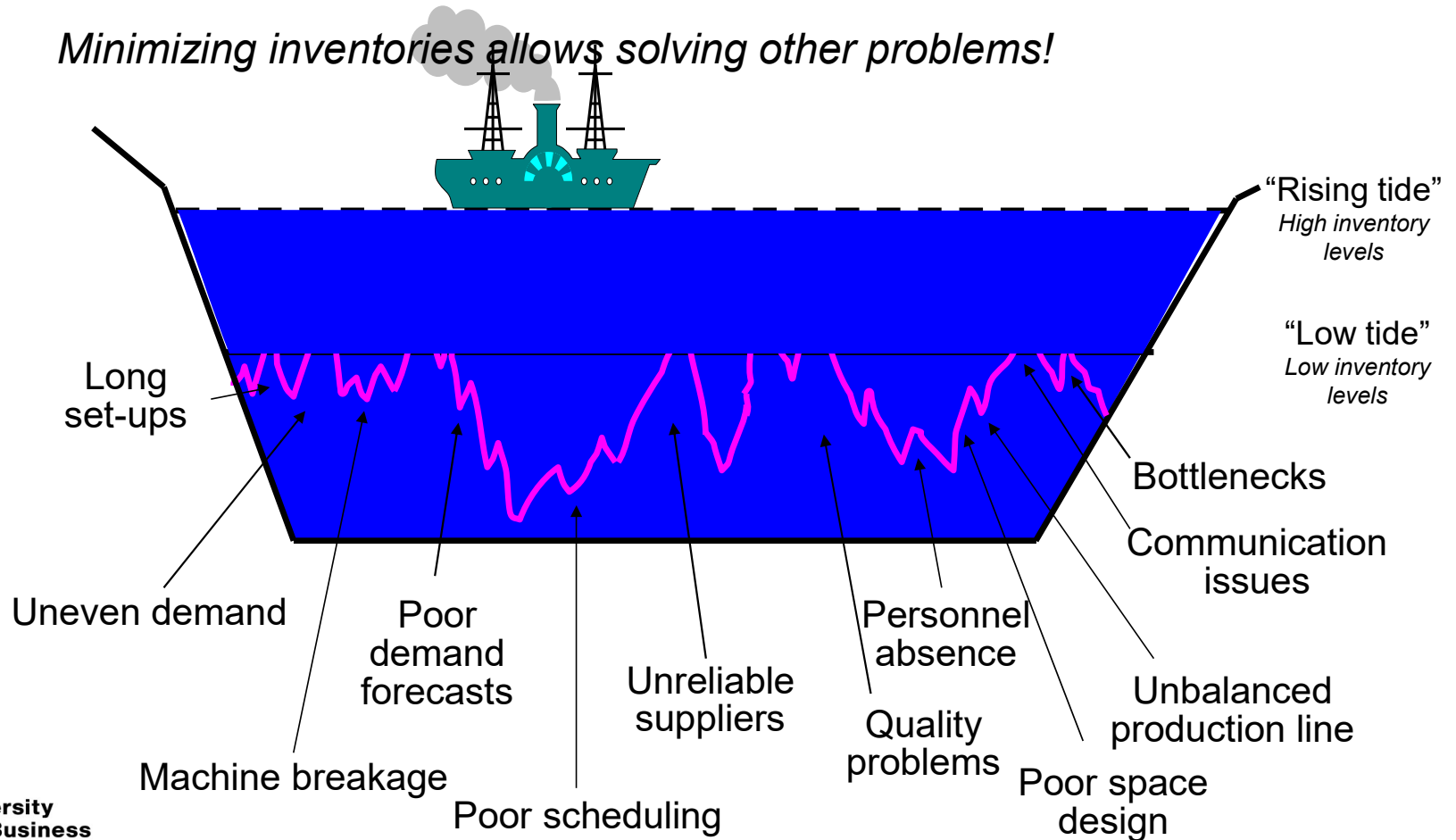
"Allows" smaller production batches

- Lower inventories (both for WIP and end products)
- Shorter throughput time



Lean – minimizing inventories

Minimizing inventories allows solving other problems!



Waste exists everywhere

Waste is “anything other than the *minimum* amount of equipment, materials, parts, space, and worker’s time, which are absolutely essential to *add value* to the product.”



Shoichiro Toyoda

1-2-4 All Activity: Identifying waste

- Using the 1-2-4 technique reflect on work you did in Assignment 1
- Your process maps had both value adding and non-value adding activities
- Try to think which processes could be labeled as “waste” using the definition given by Shoichiro Toyoda (from previous slide)
- How many waste categories can you produce?

All operations generate some waste

Mura, muri, and muda are Japanese words for different types of waste

Mura

- Unevenness in operations (internal causes), which leads to alternating stages of hurry vs. waiting.

Muri

- Overloading resources through unrealistic requirements. Such requirements lead to exhausted personnel and/or machinery and eventually to low quality.

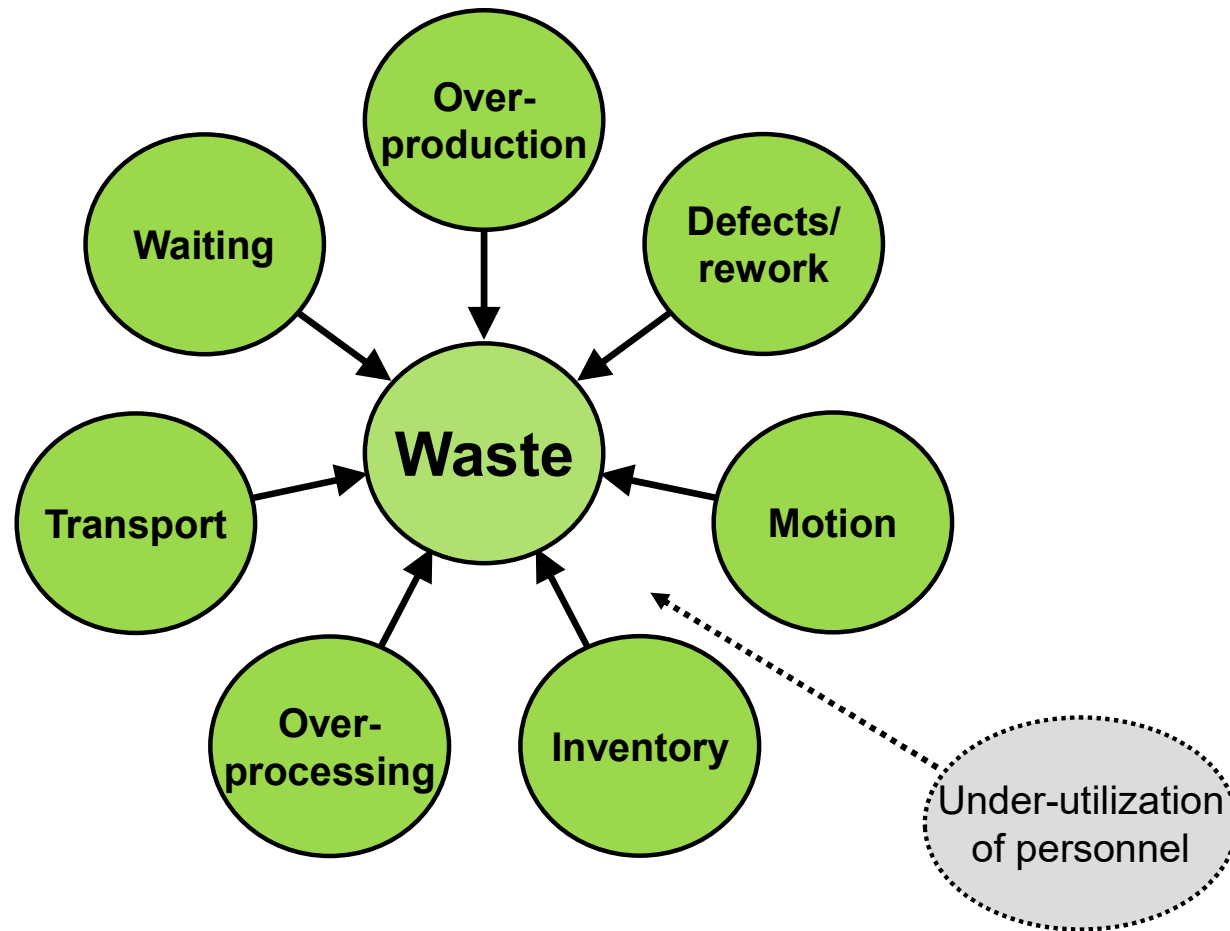
Muda

- Activities that waste resources through not producing output that is valued by customers.



*These three types of waste are interdependent: **Unevenness in operations (mura)** may lead to **exhausted resources (muri)** that can cause **non-value-adding production (muda)**.*

7 (+1) types of waste



7 (+1) types of waste

Transport – materials & products are transported



Vans drive around to collect blood samples

Defects – Things that need to be corrected



Potential safety issues

Motion – personnel move unnecessarily



Bad signage increase motion.

Inventory – “stuff” waiting to be processed



Too large an inventory wastes time & money

Waiting – for something to happen



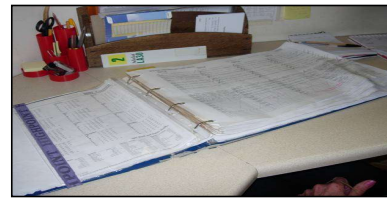
Lobbies everywhere!

Over-production – producing too much



Order more, because no visibility to inventory levels

Over-processing – complicating things



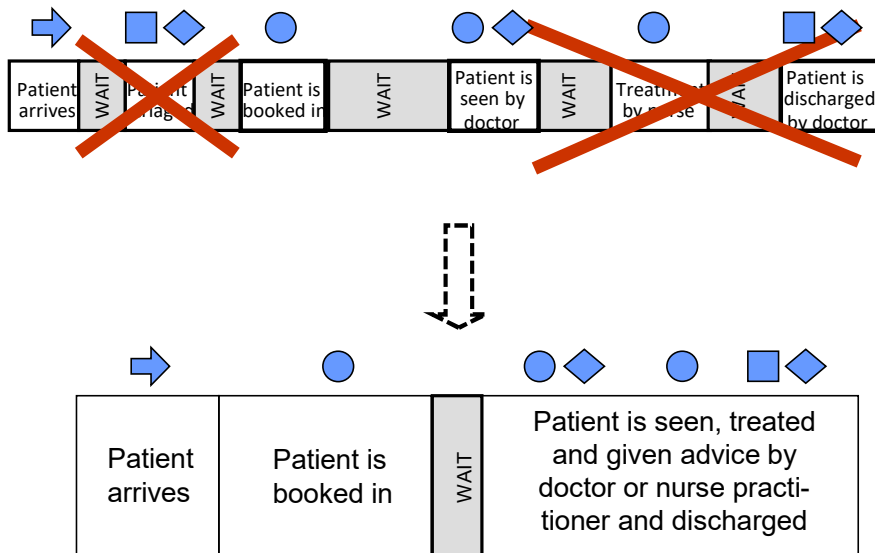
Unnecessary copying of documents

Under-utilization of personnel – skills not utilized



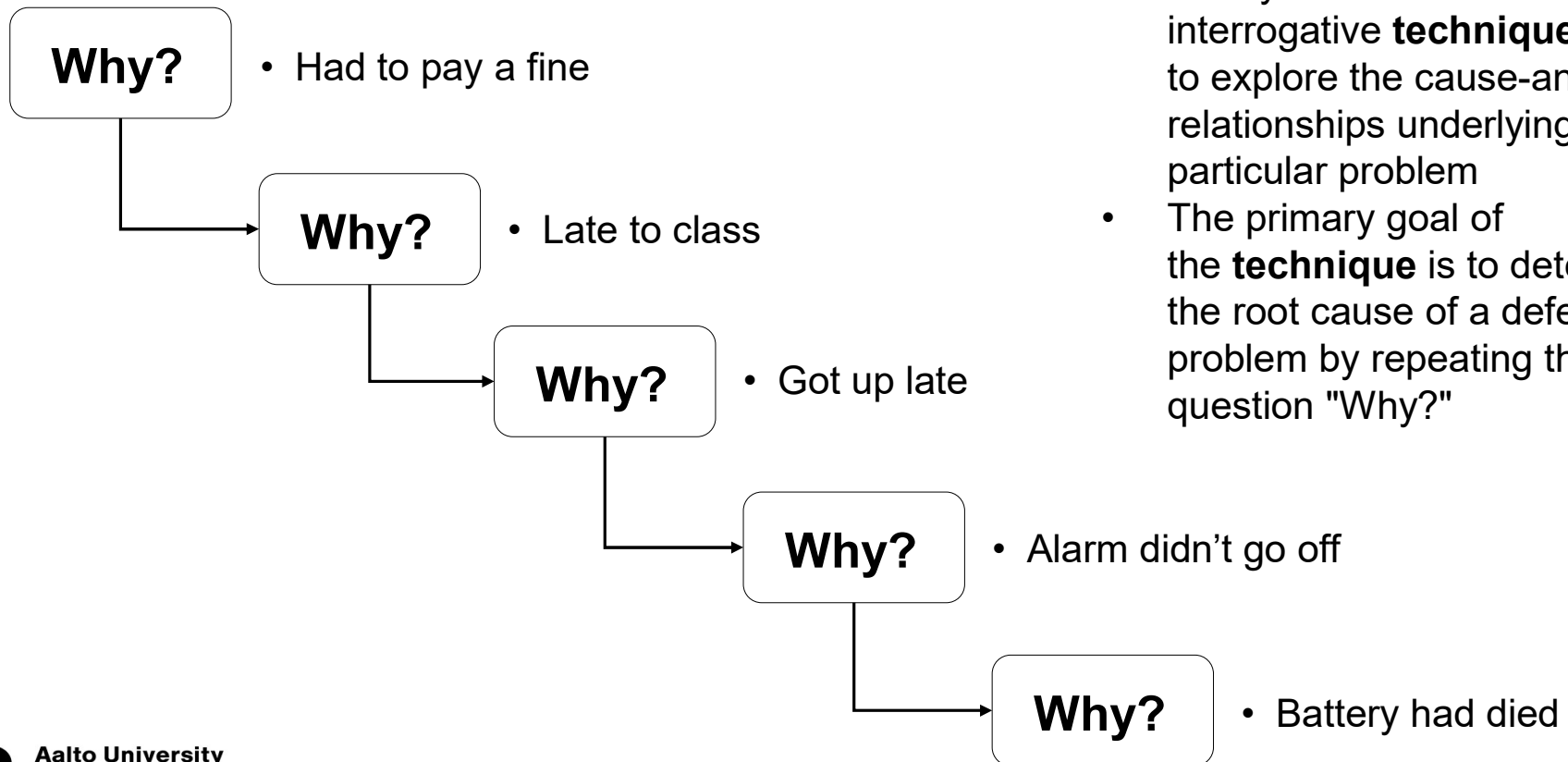
Difficult layout, shortage of space, poor safety

Removing waste – Value stream mapping and process redesign



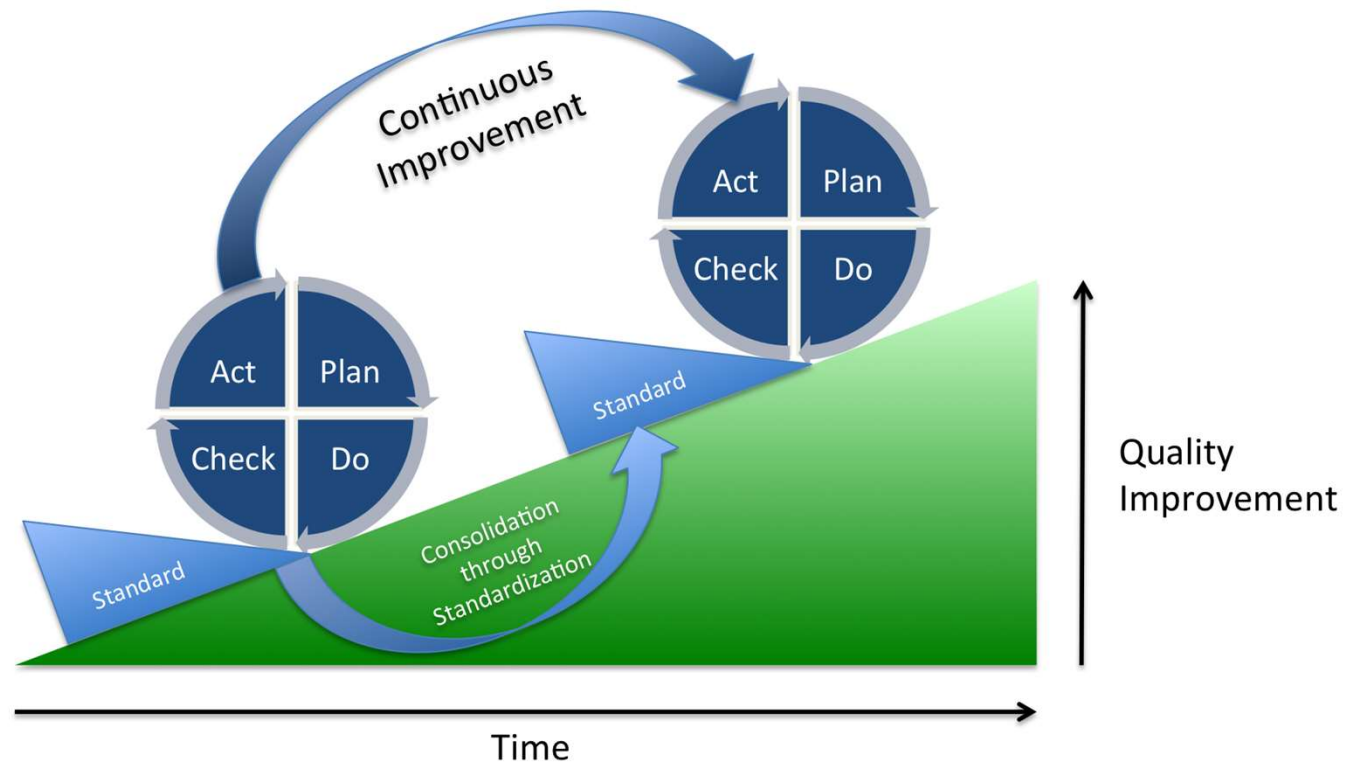
- A lean-management method for process analysis, to
 - analyze the current state
 - design a future state
 - reduce waste

5 whys technique (again)

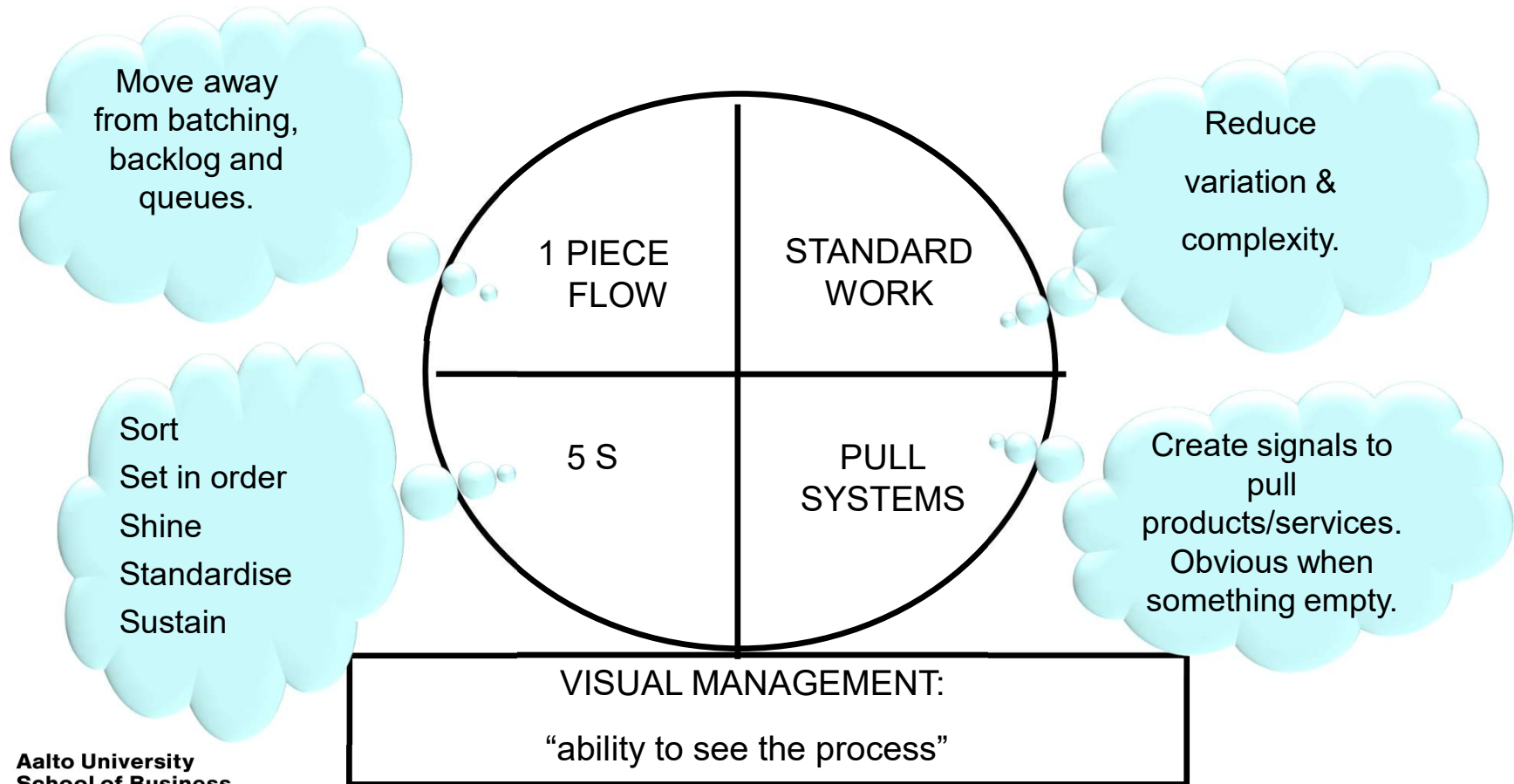


- 5 Whys is an iterative interrogative **technique** used to explore the cause-and-effect relationships underlying a particular problem
- The primary goal of the **technique** is to determine the root cause of a defect or problem by repeating the question "Why?"

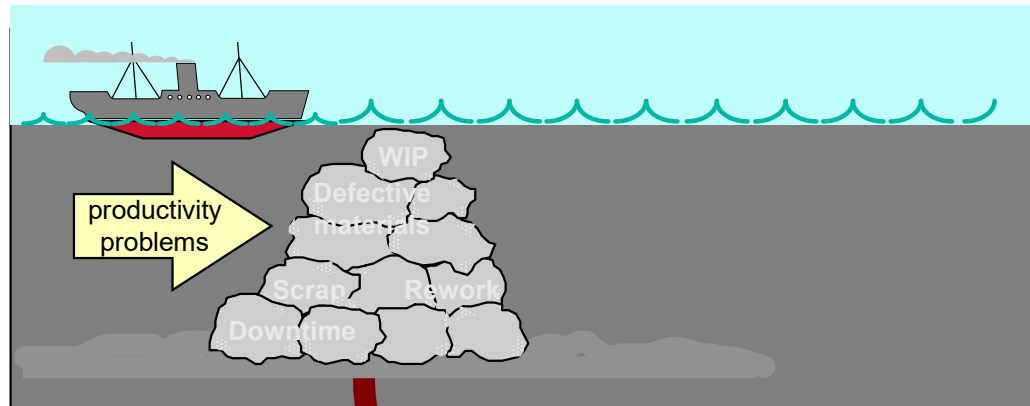
PDCA cycle



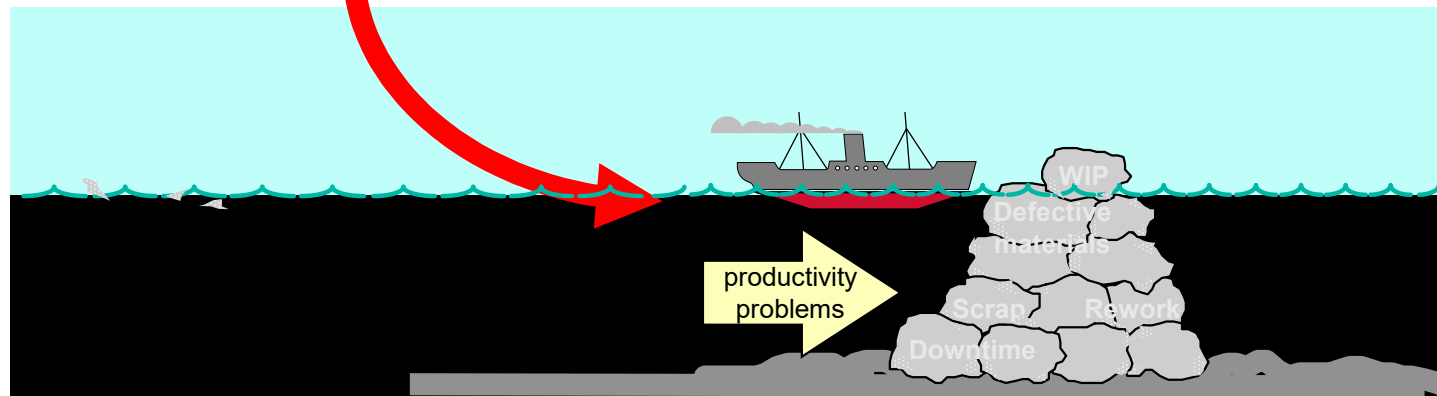
Lean principles



The 'river and rocks' analogy



Reducing the level of inventory (water) allows operations management (ship) to see problems in the process (rocks)



How does Lean eliminate waste?

- Identify the causes and types of waste
 - e.g. 5 whys technique & 7+1 types of waste
- Eliminate waste through
 - streamlined flow using e.g. Value stream mapping
 - matching supply and demand e.g. Pull system
 - minimizing variability e.g. level delivery Schedule
 - flexible processes
- Can be viewed through 5S

Just in Time VS Just in Case

- The rise of Lean popularity is somewhat tied to historic context
- Discuss with partner about the value of Lean methodology today
- Is Lean suitable for post-covid 19 global business landscape?
- Decide if Lean thinking will be as relevant in the next 5 years.

Dual benefits of higher quality

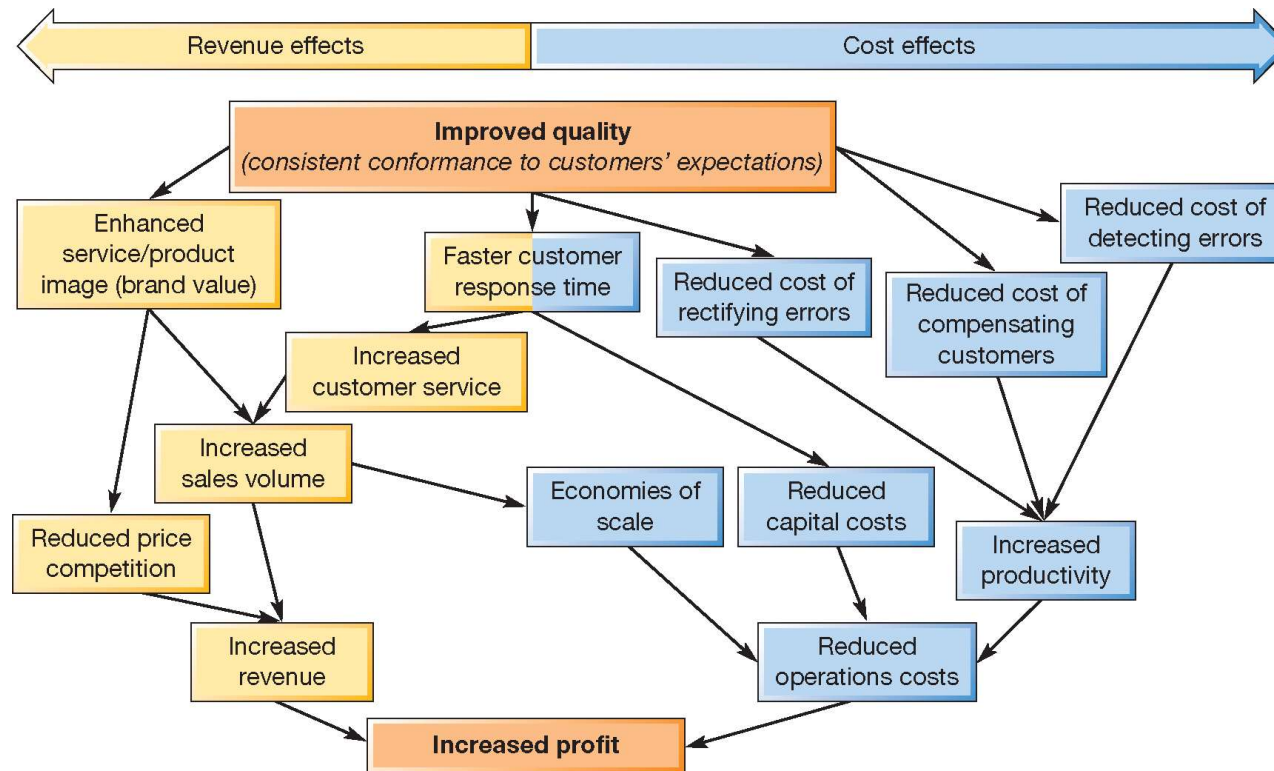
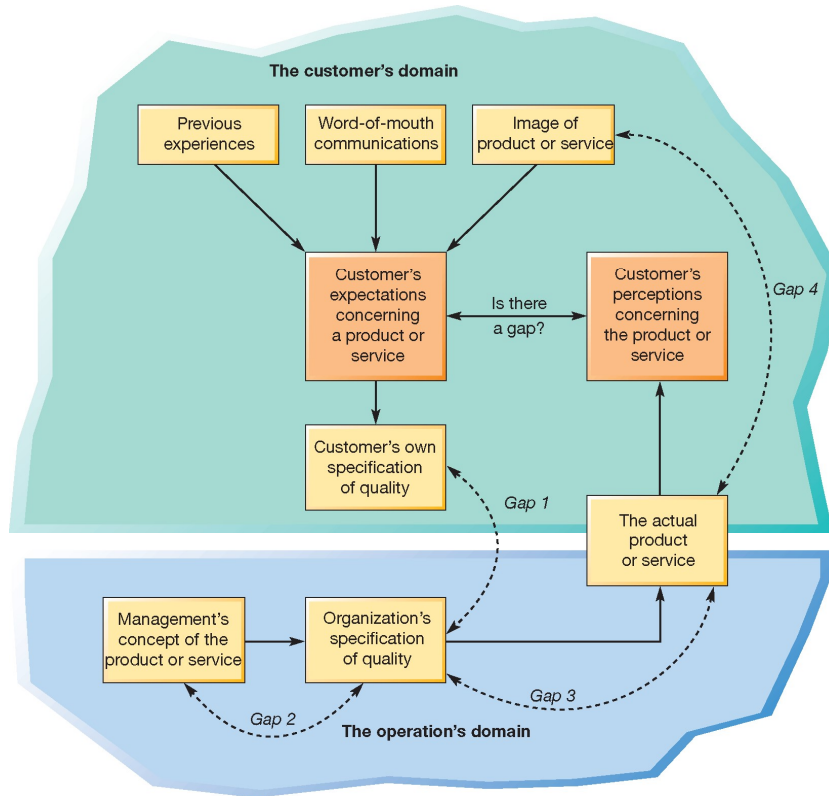


Figure 17.2

Customers' expectation and actual quality



TQM as an extension of previous views of quality

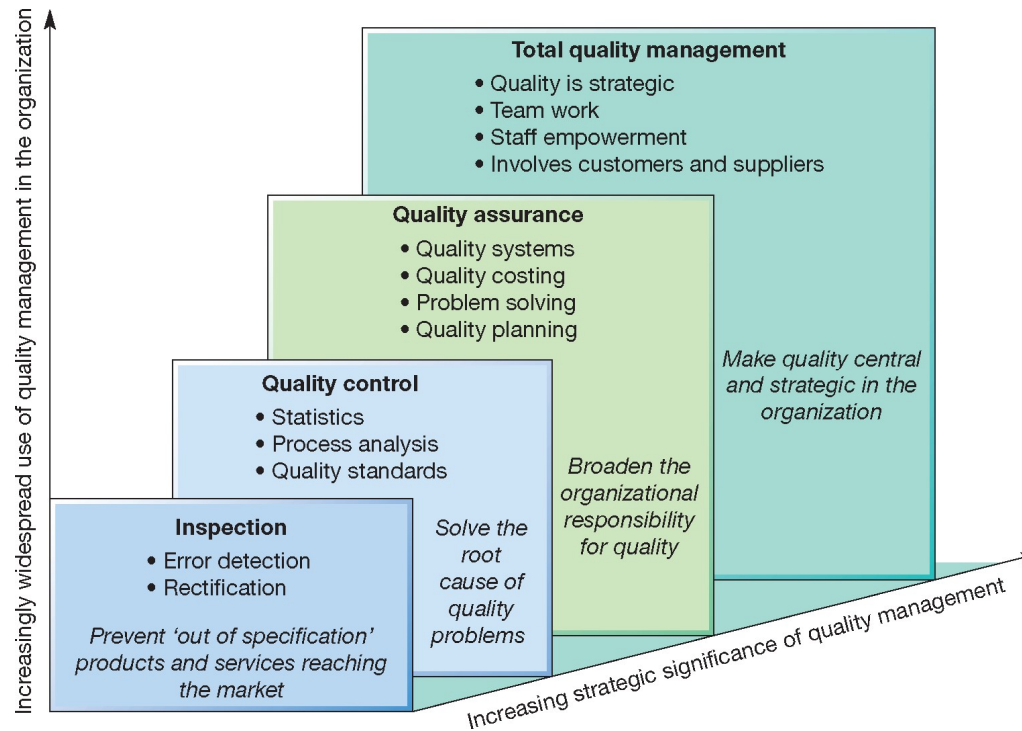
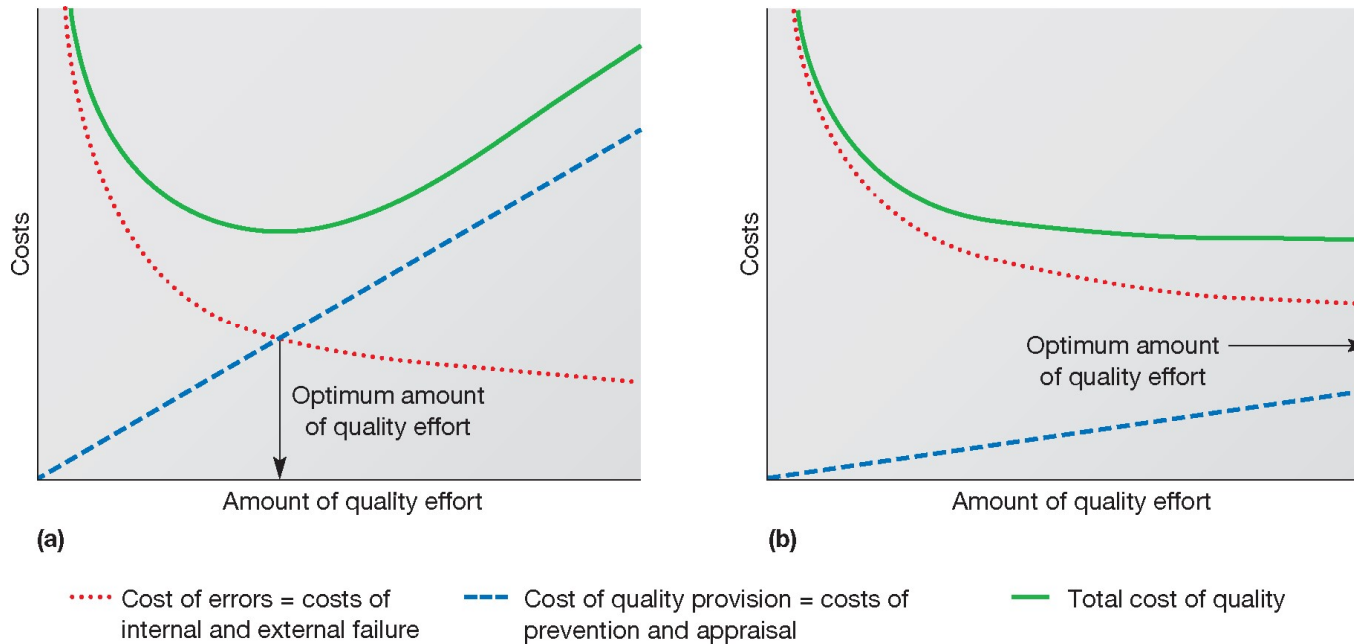


Figure 17.8

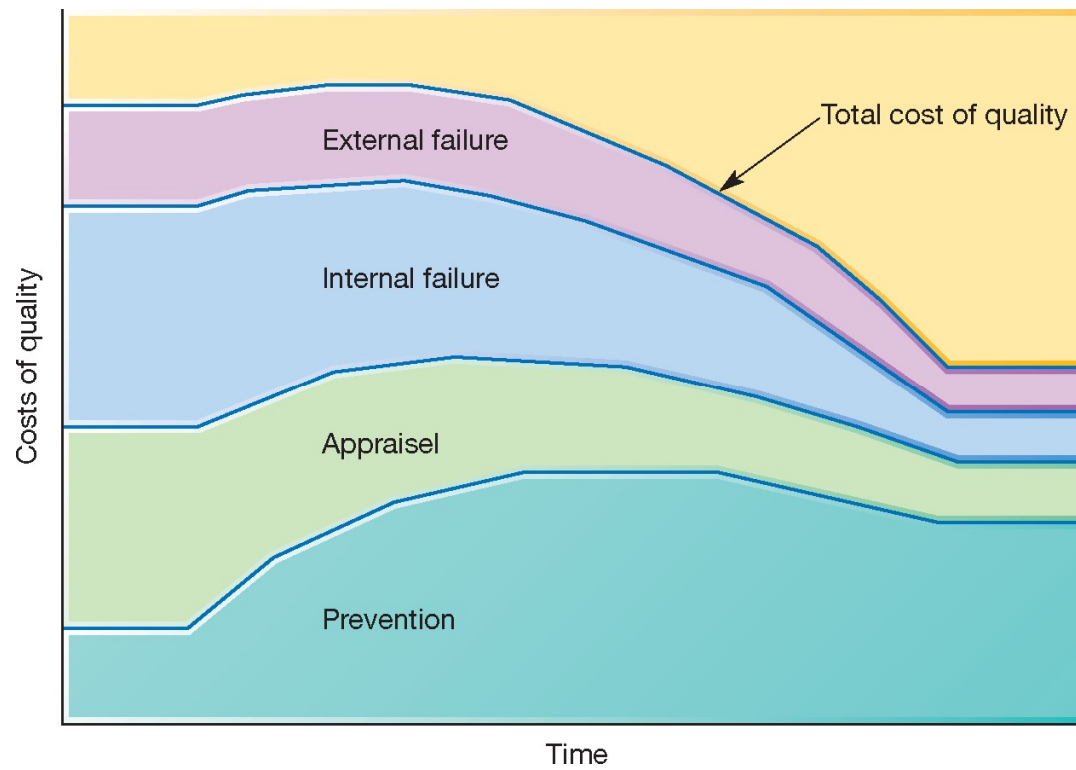
(a) The traditional cost of quality model, and (b) the traditional cost of quality model with adjustments to reflect TQM



A!

Figure 17.9

Investment in TQM



A!

Figure 17.10

References

- Krajewski, L. J., Malhotra, M. K. & Ritzman, L. P. 2019. Operations management: Processes and supply chains. Twelfth edition. Global edition. Harlow, England: Pearson.
- Slack, N., Brandon-Jones, A. & Burgess, N. 2022. *Operations management*. Tenth edition. Harlow, England ; New York: Pearson.
- Finne, M. (2022) Operations Management course. [bachelor course] Aalto Yliopisto.

VALEY HEALTH CASE STUDY



Developing a vaccine
distribution strategy

Introduction

In this assignment, you're to imagine you are part of a sourcing and logistics team for a fictional health authority in British Columbia, Canada. The key themes of the case are the sourcing and delivery of Covid-19 vaccines and the planning of a new facility. You'll find most of the information you need in the case material, but feel free to use other trusted sources.

Levels of analysis

- Macro Level
- Meso Level
- Micro Level

Emails

- Email from the CEO of Valley Health
- Email from John Cahill Sourcing Director of Valley Health (Macro)
- Email from Laura Jenkins Logistics Manager (Meso)
- Email from Markus Jones Healthcare Center Manager (Micro)

Assignment deliverables

- Here's what you need to submit for this assignment:
 - A 5-page report outlining 3 analysis levels: macro, meso, and micro.
 - 10 presentation slides handed in along with the report.
 - An in-class 10-minute presentation focusing on just one of the three solutions. The specific solution to focus on will be specified by the teacher after the report and slides are submitted.
-
- EVERYONE SUBMITS BOTH WRITTEN ASSIGNMENT AND PRESENTATION SLIDES
 - ON DAY 1 OF PRESENTATIONS LECTURER WILL ANNOUNCE PRESENTATION ORDER
 - EVERYONE PRESENTS ONLY 1 SOLUTION TYPE (MACRO, MESO, MICRO)
 - BUT BE PREPARED FOR QUESTIONS REGARDING ALL THREE LEVELS!

A!

**Kiitos
aalto.fi**