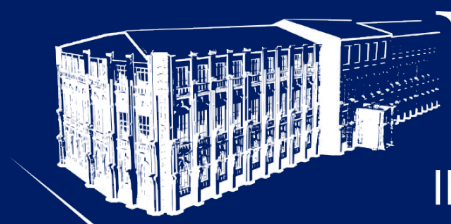


WESTMINSTER

INTERNATIONAL UNIVERSITY IN TASHKENT

An Accredited Institution of the University of Westminster (UK)

Quality & Operations Management

Lecture 1

Introduction to Quality & Operations Management Part II

Agenda

- Recap
- ”Gap” Model of Quality
- Quality Costs
- Topology of operations (Four Vs)
- Assignment Task

Module Learning Outcomes

By the end of the module the student will be able to:

1. Discuss quality management practices in organizations and how quality management facilitate organisational effectiveness.
2. Evaluate the importance of product and service design decisions and its impact on other design decisions and operations.
3. Apply principles of various planning activities including capacity planning, aggregate planning, project planning and scheduling.
4. Analyse contemporary supply chain management and inventory management activities and their relation to organisational effectiveness.

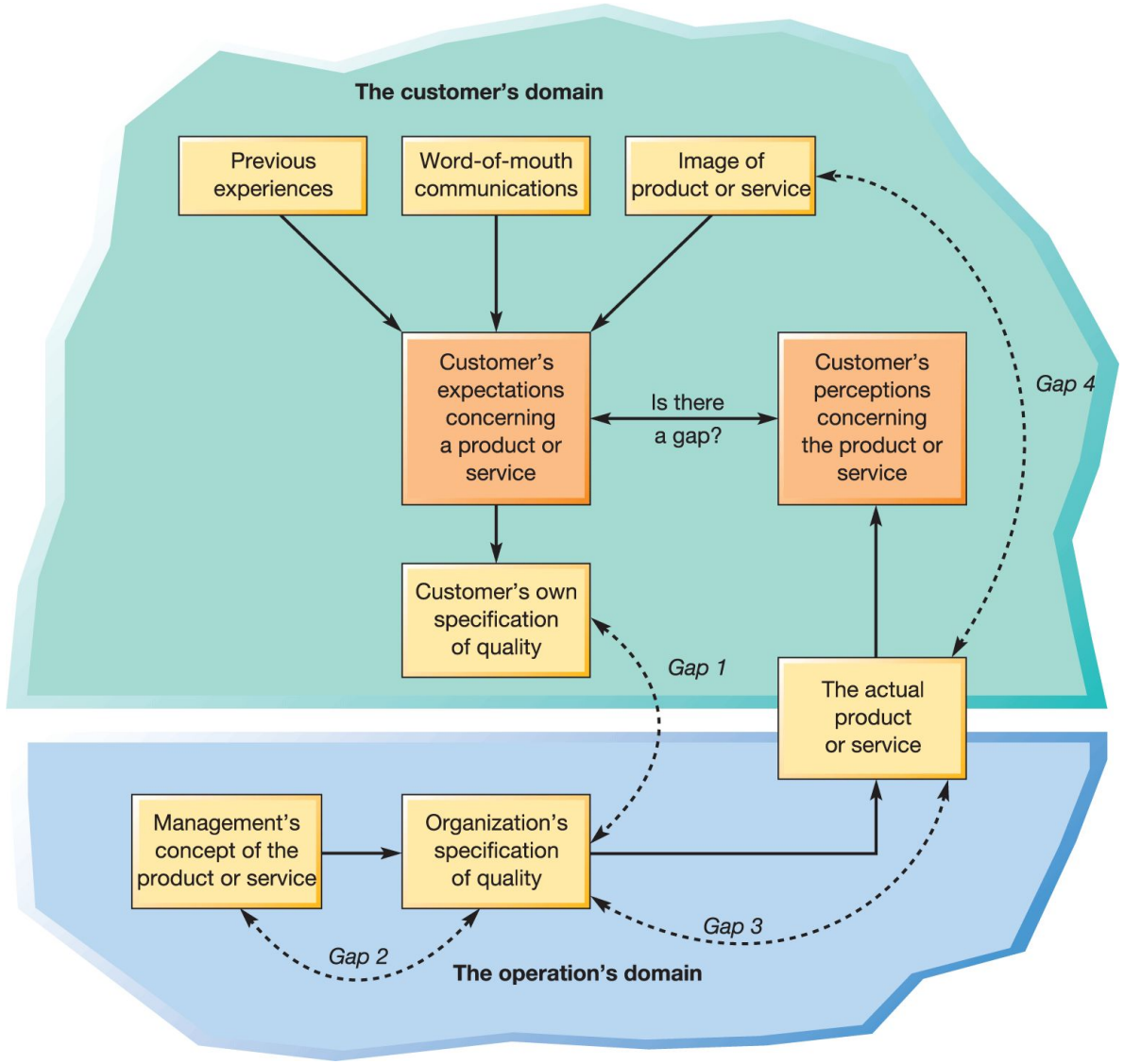
Views on Quality

- According to **operation's view**, quality is defined as **consistent conformance** to **customers' expectations**. (Slack *et al.* 2010)
  - Conformance
  - Consistence
  - Customer expectations

- According to **customer's view**, quality is how **customer understands** and individually **perceives** a service or product in different ways.

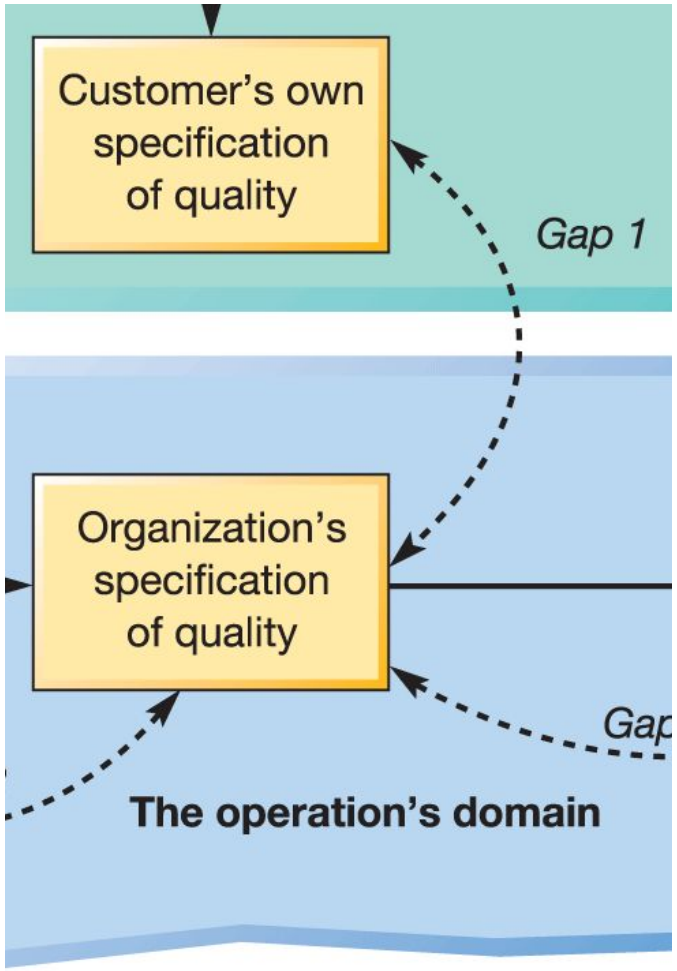
❖ **Operations Principle: Quality is multi-faceted; its individual elements differ for different operations.**

“ Gap “ Model of Quality



Source: Adapted from Parasuraman, A. et al. (1985) A conceptual model of service quality and implications for future research, *Journal of Marketing,* vol. 49, Fall.

Gap 1

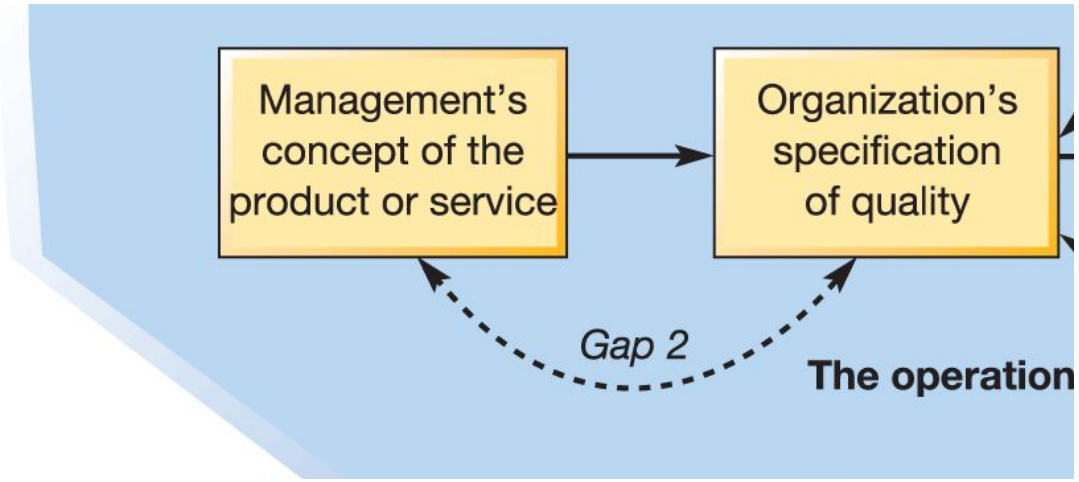


The customer's specification-operation's specification gap

Perceived quality could be poor because there may be a mismatch between the organization's own internal quality specification and the specification which is expected by the customer.

A car may be designed to need servicing every 10,000 kilometers but the customer may expect 15,000 kilometer service intervals

Gap 2

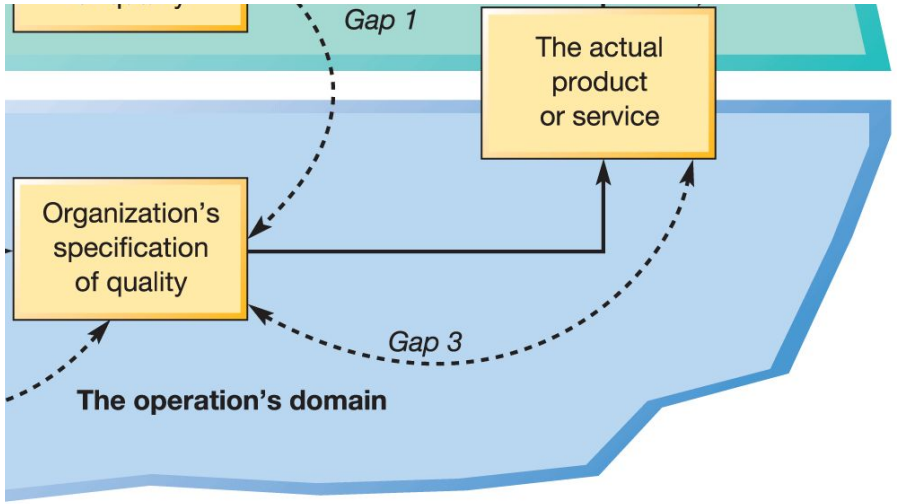


The concept-specification gap

Perceived quality could be poor because there is a mismatch between the service or product concept and they way the organization has specified quality internally.

The concept of a car might have been for an inexpensive, energy-efficient means of transportation, but the inclusion of a climate control system may have both added to its cost and made it less-energy efficient.

Gap 3

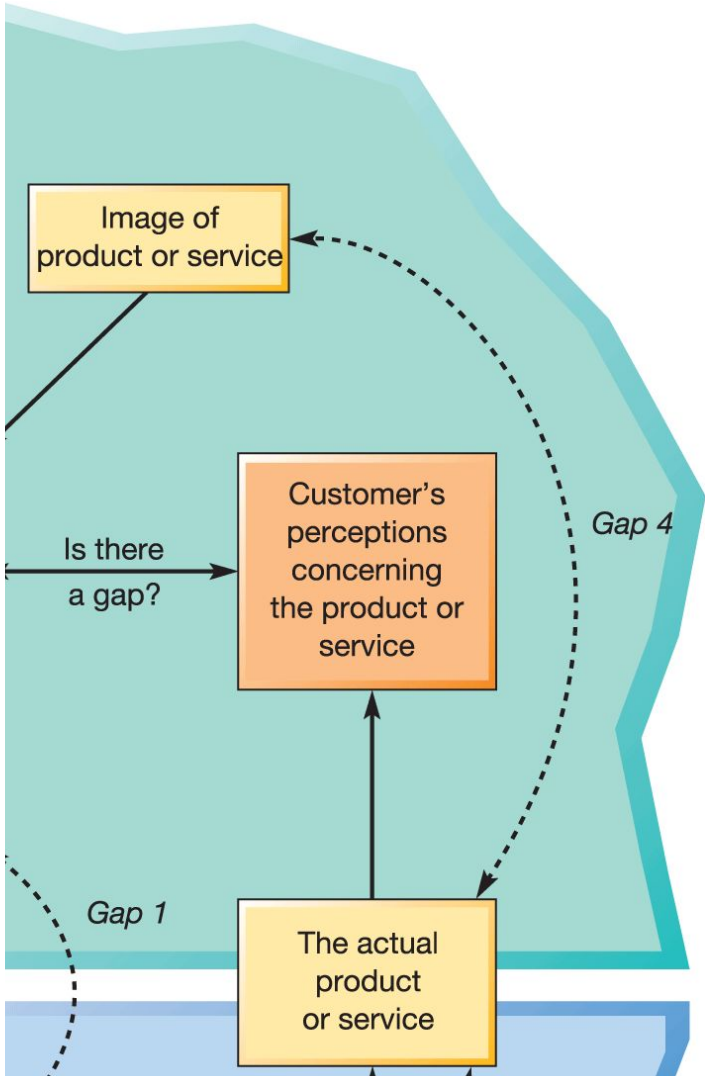


The quality specification-actual quality gap

Perceived quality could be poor because there is a mismatch between actual quality and the internal specification
(often called conformance to specification).

The internal quality specification for a car may be that the gap between its doors and body, when closed, must not exceed 7 mm. However, because of inadequate equipment, the gap in reality is 9mm

Gap 4

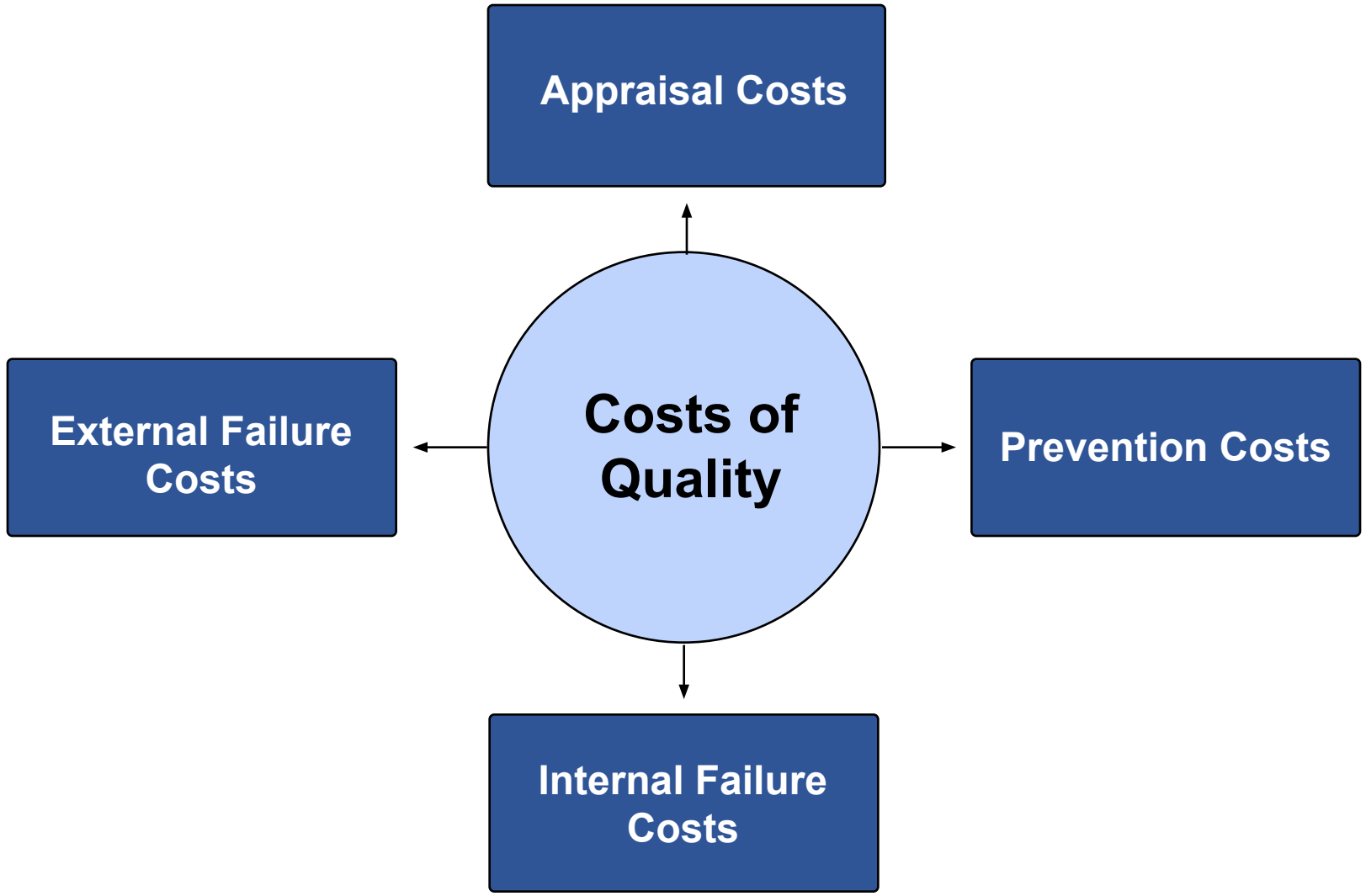


The actual quality-communicated image gap

Perceived quality could be poor because there is a gap between the organization's external communications or market image and the actual quality delivered to the customer.

An advertising campaign for an airline might show a cabin attendant offering to replace a customer's shirt on which food or drink has been spilt, whereas such a service may not in fact be available should this happen

Costs of quality



1.Preventing Costs

- **Preventing are** those costs incurred in trying to prevent problems, failures and errors, from occurring in the first place. They include such things as:

- **identifying potential problems** and putting the process right before poor quality occurs;
- **designing and improving** the design of products and services and processes to reduce quality problems;
- **training and development** of personnel in the best way to perform their jobs;
- **process control**.

2.Appraisal costs

- **Appraisal costs** are those costs associated with controlling quality to check to see if problems or errors have occurred during and after the creation of the service or product.

- **the setting up** of statistical acceptance sampling **plans**;
- **the time and effort required** to inspect inputs, processes and outputs;
- **obtaining** processing **inspection** and **test data**;
- **investigating** quality **problems** and **providing** quality **reports**;
- **conducting** customer **surveys** and quality **audits**.

3.Internal failure costs

- **Internal failure costs** are failure costs associated with errors which are dealt with inside the operation. These costs might include such things as:

- the **cost** of scrapped **parts** and **materials**;
- **reworked parts** and **materials**;
- **the lost** production **time** as a result of coping with **errors**;
- **lack of concentration** due to time spent **troubleshooting** rather than improvements.

4.External failure costs

- **External failure costs** are those which are associated with an error going out of the operation to a customer. These costs include such things as:

- **loss of customer goodwill** affecting future business;
- **aggrieved customers** who may take up time;
- **litigation**;
- **guarantee** and **warranty costs**;
- **the cost** to the company of providing **excessive capability** (too much coffee in the pack or too much information to a client).

The Four Vs

The Four Vs

❖**Operations Principle: The way in which processes need to be managed is influenced by VOLUME, VARIETY, VARIATION AND VISIBILITY.**

- The volume of processes' output
- The variety of the output
- The variation in demand for the output
- The degree of visibility which customers have of the creation of output

The implications of the four Vs predetermine the way how the operations are to be organized.

Volume Dimension

The volume and frequency of the processes. If there is high-volume production (for instance, Fast Food restaurant or assembly line) it becomes vital to standardize the processes.

When there is high volume – the processes are mostly repeatable. By systemizing and standardizing *low unit costs* may be achieved.

Contrast these two examples:

A Burger from EVOS

- Ingredients prepared in advance
- Time for preparation is short
- Expected quality
- Low unit cost (ingredients bought in bulk)

A Burger from Cafeteria

- No ingredients prepared in advance
- Time for preparation is long
- Quality-wise might be better
- High unit cost (rarely ordered, therefore no procurement made)

Variety Dimension

There are companies offering different varieties of products or services.

VS

- Picks up the customer from any place
- Drops off almost everywhere
- Change of the route is possible

- Picks up the customer from the station
- Drops off only at the station
- Change of the route is rarely possible

Which has lower costs?

Variation in Demand Dimension

There are companies changing capacities according to the variation of the demand in the market.

Hotel located by the winter resort

- Seasonal demand
- Hard to predict
- Extra costs

Hotel located in city center

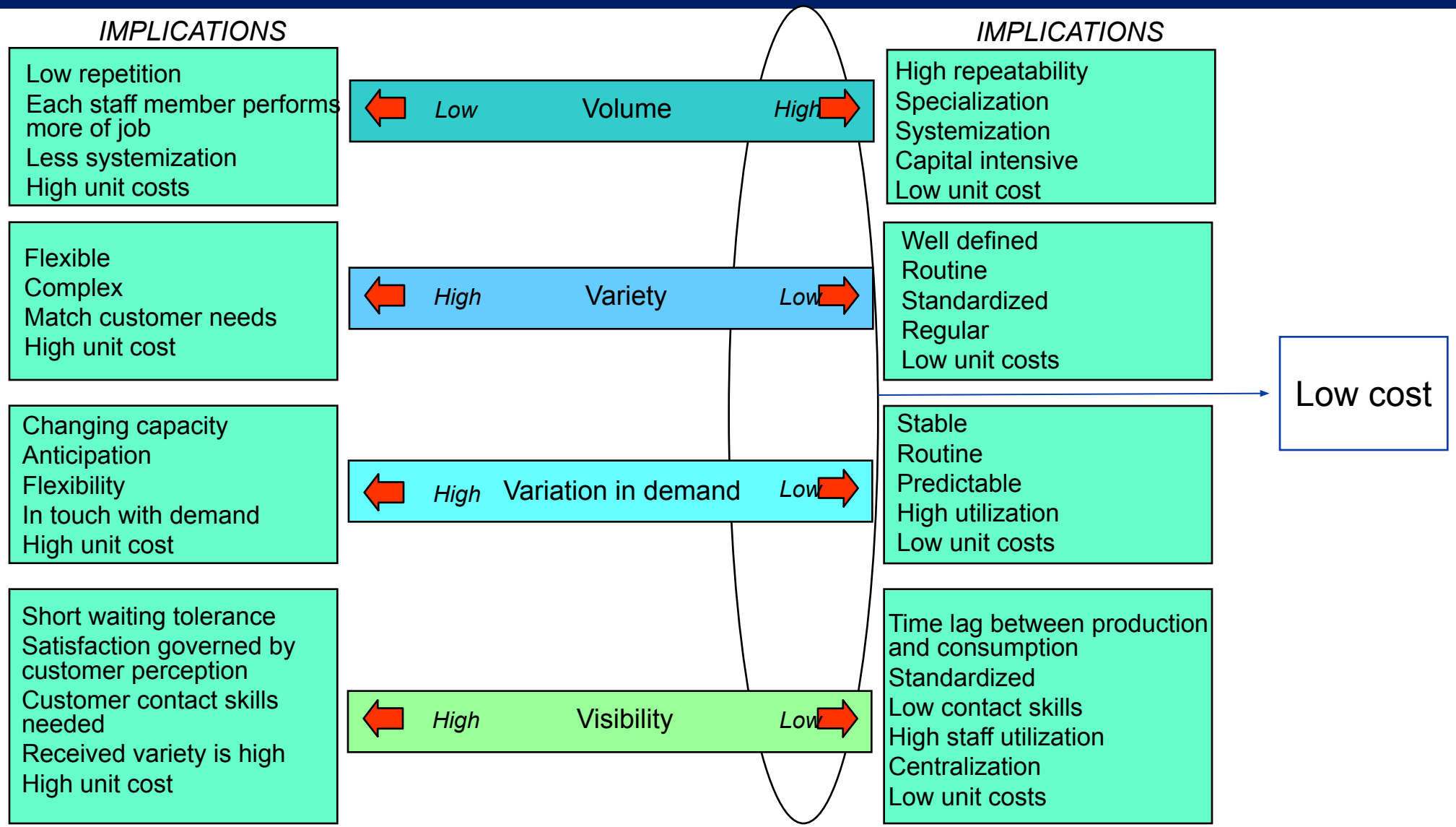
- Stable demand
- Easier to forecast
- No extra costs

Visibility Dimension

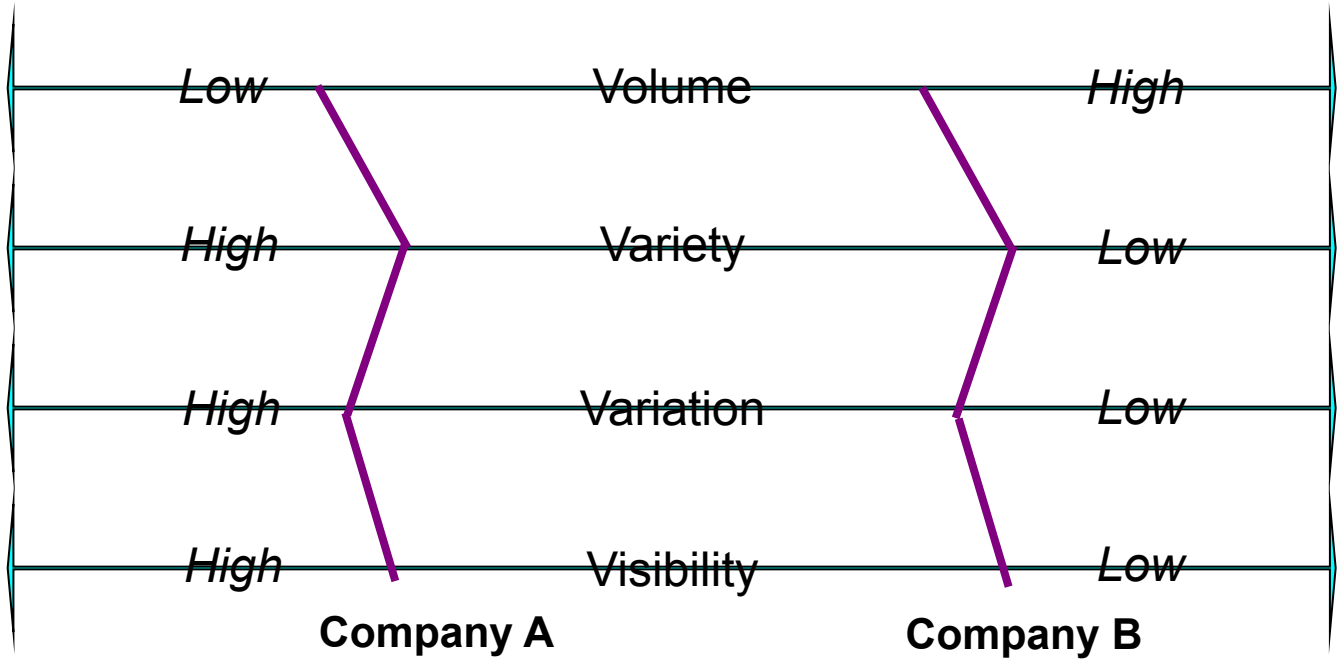
This dimension means how much of the operation's activities its customers experience, or how much the operation is exposed to its customers.

(Restaurant service or fast food business focuses on customer-processing operations).

A Topology of Operations



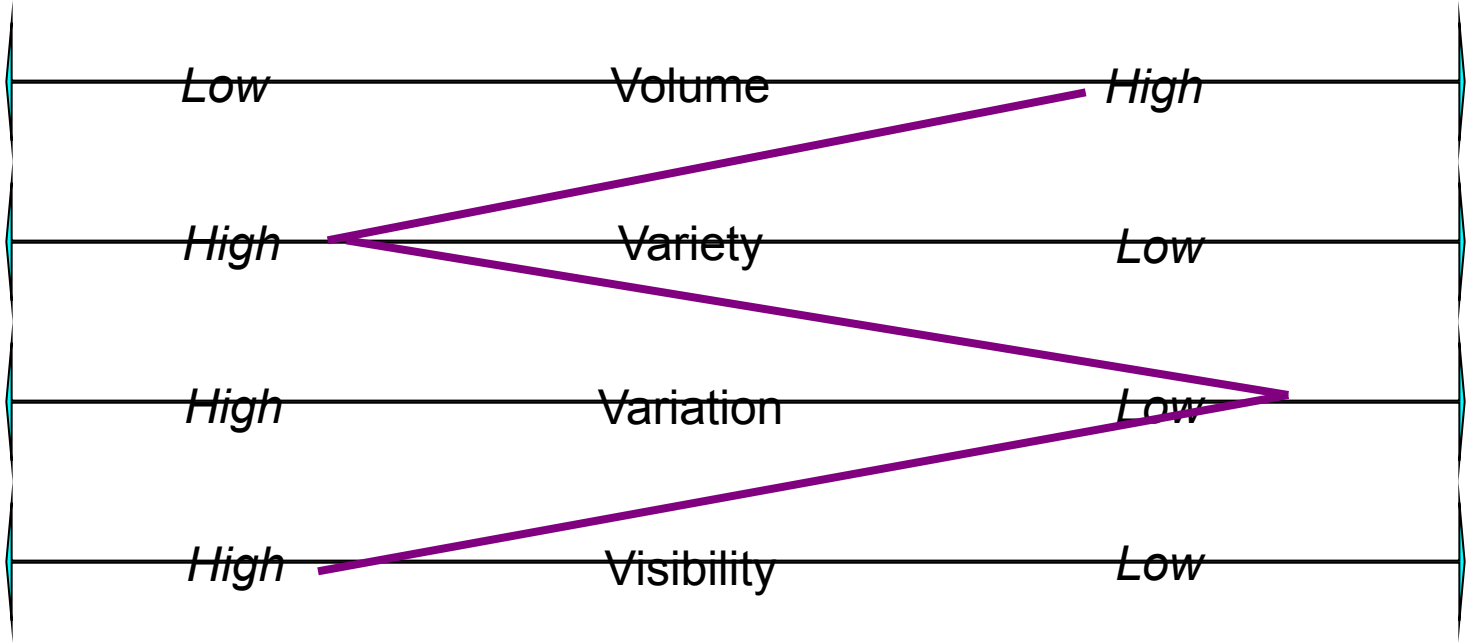
A Topology of Operations



- Important to understand how different operations are positioned on the 4V's.
- Is there position where they want to be?
- Do they understand the strategic implications?

Example

Four Vs at Subway



Volume is high – customer traffic is constant

Variety is high – customer can assemble a sandwich out of numerous breads, vegetables, sauces

Variation in demand is low – there are no seasonal fluctuations

Visibility is high – sandwiches are prepared in front of the customer and the feedback is instant, any changes can be done (mistakes fixed) without extra cost for customer and the store

Input-Transformation-Output Process

TRANSFORMED RESOURCES

Ingredients:

- Bread
- Filling
- Salad
- Sauce

TRANSFORMING RESOURCES

Facilities

Staff

- Sandwich artist

INPUT

TRANSFORMATION PROCESS

OUTPUT

Subway Sandwich

Conclusion

- Operations processes have mainly **four (4Vs)** characteristics:
  - The volume dimension
  - The variety dimension
  - The variation dimension
  - The visibility dimension
- **Quality costs** include:
  - Prevention costs
  - Appraisal costs
  - Internal costs
  - External costs

References

- Nigel S, Alistair B, and Robert J (2016). *Operations Management.* Pearson Publishing. (chapter 1)
- Nigel S, Alistair B, and Robert J (2013). *Operations Management.* Pearson Publishing. (chapter -17)