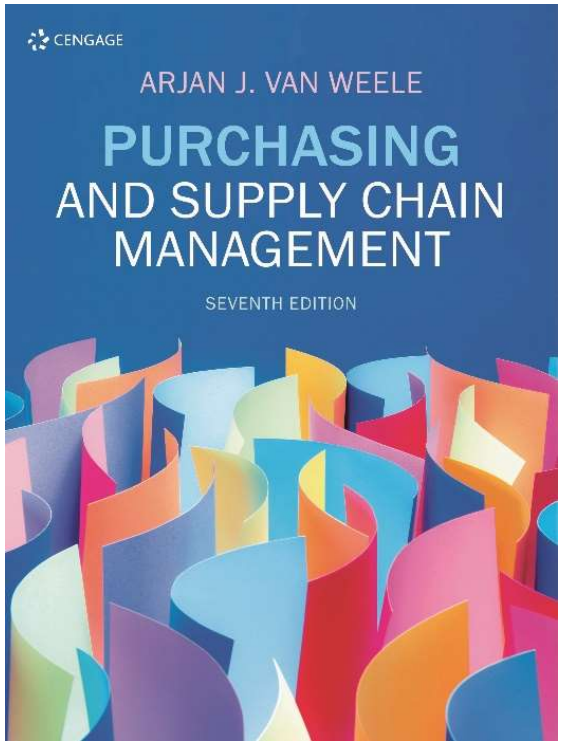


MASTER OF SCIENCE IN BUSINESS ADMINISTRATION

Procurement & Supply Chain
Prof. Corrado Cerruti

Chapter 10

Purchasing, innovation and quality management

CENGAGE Learning

For use with Purchasing and Supply Chain Management 7th Edition by Arjan J. van Weele (9781473749443)

Learning objectives

- Why large companies pursue ‘open innovation’ in their external relationships.
- The challenges of integrating purchasing in technical design and new product development processes.
- What it takes to involve suppliers early in new product development.
- The most important concepts concerning purchasing and quality management.
- Purchasing’s role in and contribution to quality management.
- How to set up a supplier quality assurance (SQA) programme.
- How to improve supplier performance.

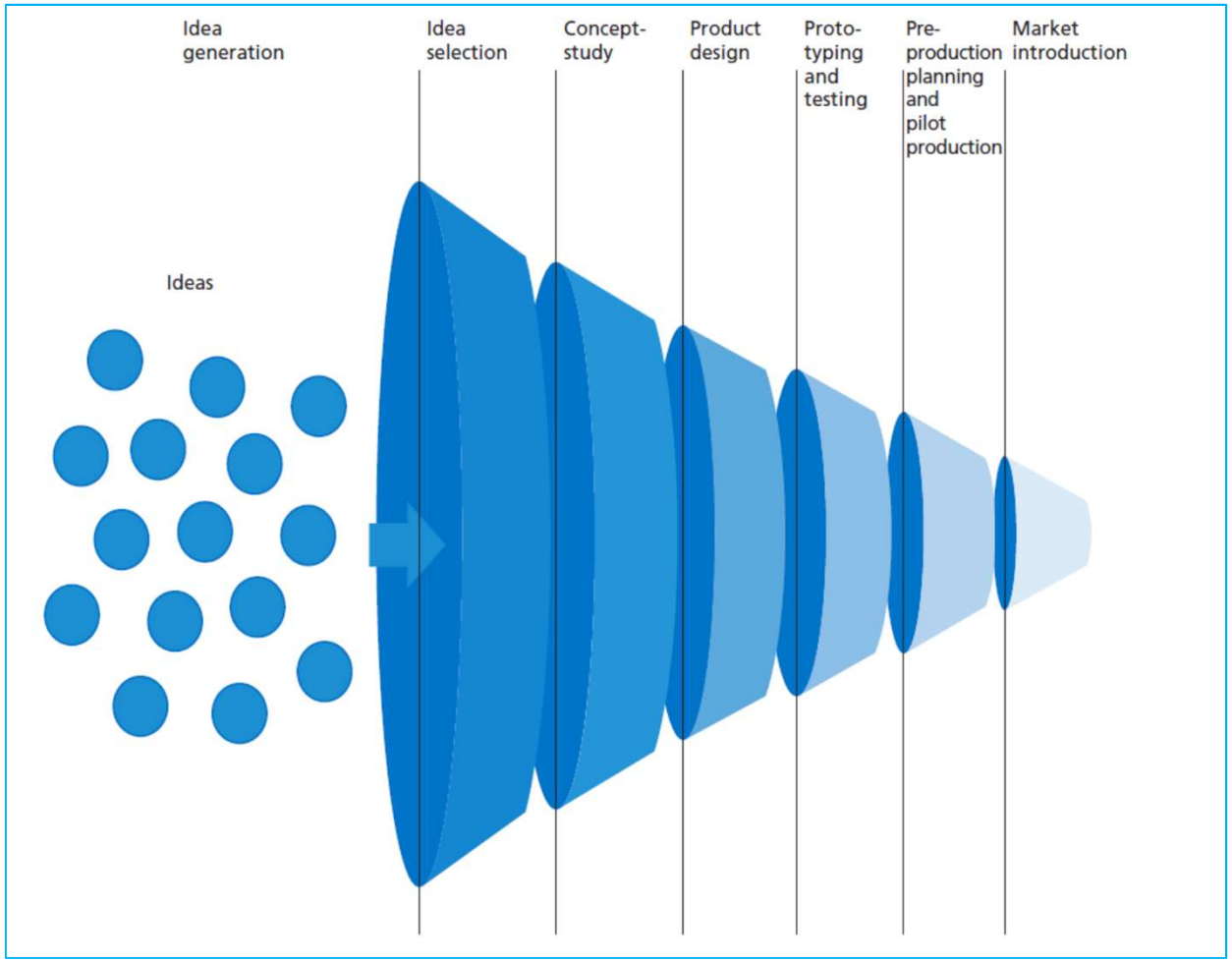
Purchasing and innovation

- Innovation is different than two decades ago:
- Transition from closed to open innovation:
    - Sharing ideas
    - Stage-gate models
- **Open innovation –**

  The purpose of open innovation is to create close collaboration on R&D, new product design and development and market introduction with parties that share the company's business interests in such collaboration.
- **Closed innovation -**

  Closed innovation implies that companies try to develop new products and processes based on the idea that the company itself has the best possible knowledge and resources for innovation.
- Complexity of products asks for external expertise.
- External cooperation can speeds up the innovation process.

Figure 10.1 The innovation funnel: innovation managed as a process marked with stage gates



The role of suppliers: Early supplier involvement

- Suppliers are an increasingly important source of innovation, e.g. The automotive industry
  - fuel injection by Bosch
  - sun protecting and security glass by Saint Gobain
- Academic results are controversial
- Some problems in early supplier involvement
  - Conditions for cooperation not always present;
  - Conflicts considering intellectual property
  - Overestimation of the developing skills of supplier
  - How to reward the supplier for the efforts

Early supplier involvement

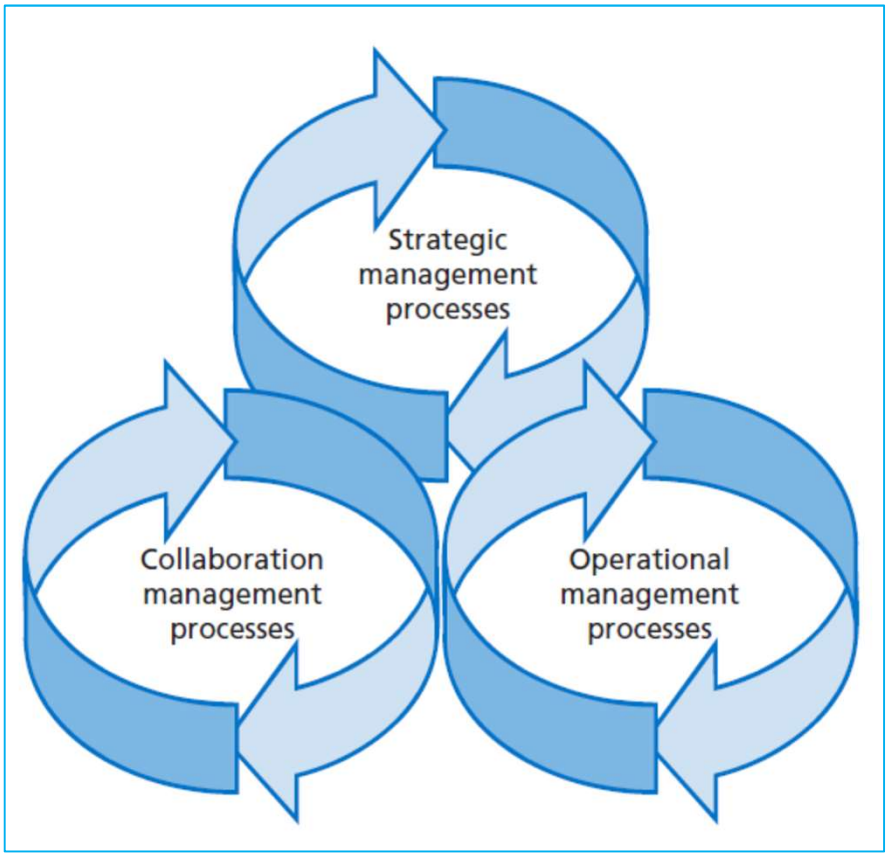
- Echtelt (2004) distinguishes:
  1. Short term benefits
     - Better production quality
     - Lower production costs
     - Shorter develop cycle
     - Lower developing costs
  2. Long term benefits
     - Joint research programmes
     - Aligning technology strategies
     - Risk sharing

Early supplier involvement

Three parallel processes:

1. Strategic management processes
   - Create infrastructure for future technological collaboration
2. Operational management processes
   - Individual development process
   - For which technology areas do we want to get suppliers involved
3. Collaboration processes
   - Cooperate with external parties

Figure 10.3 Integrated new product development: three core processes



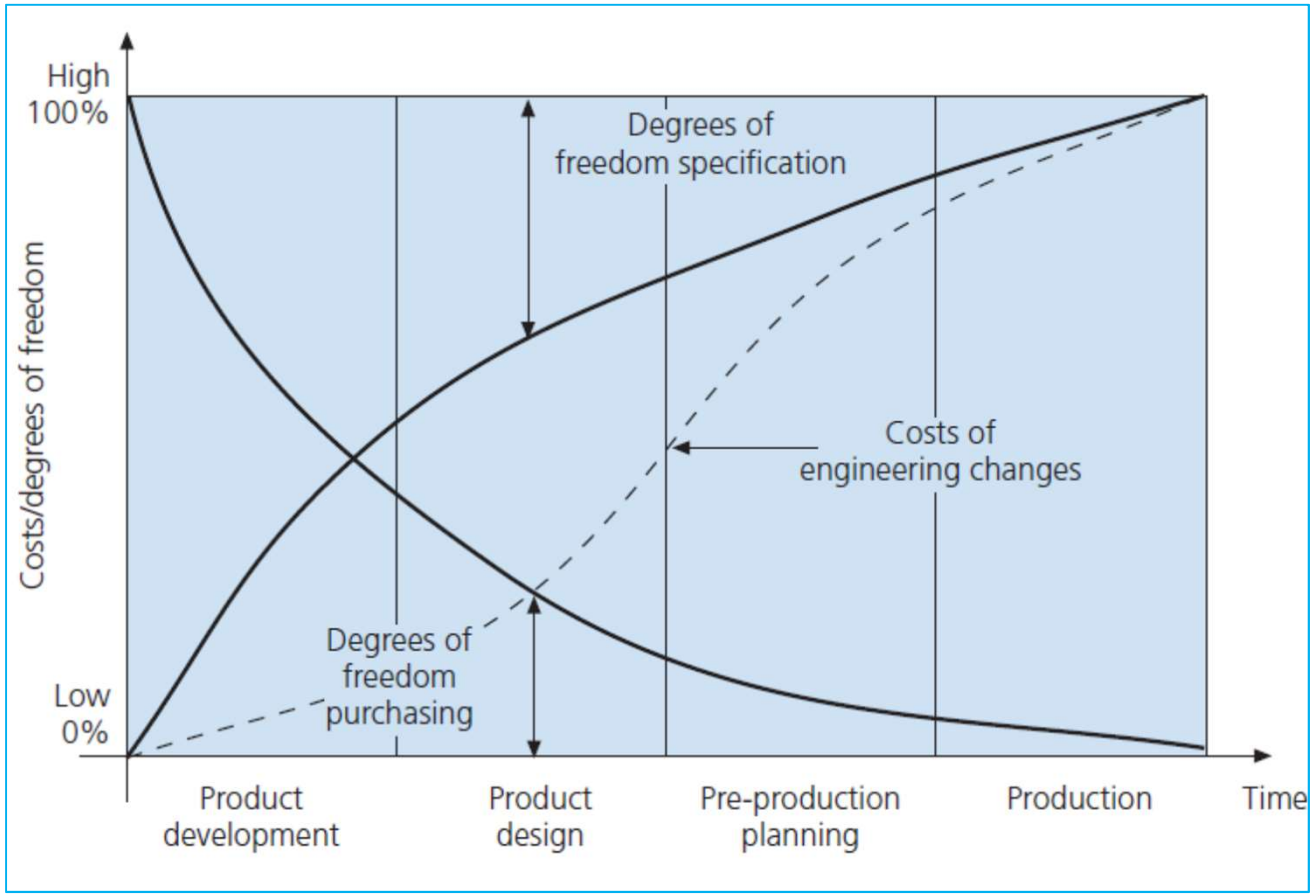
Source: Van Echtelt (2004)

Purchasing and new product development

Stages of new product development:

- Idea generation
- Concept study stage
- Design stage
- Product development
- Preproduction planning
- Pilot production
- Start of regular production

Figure 10.4 Purchasing's relationship to the new product development process

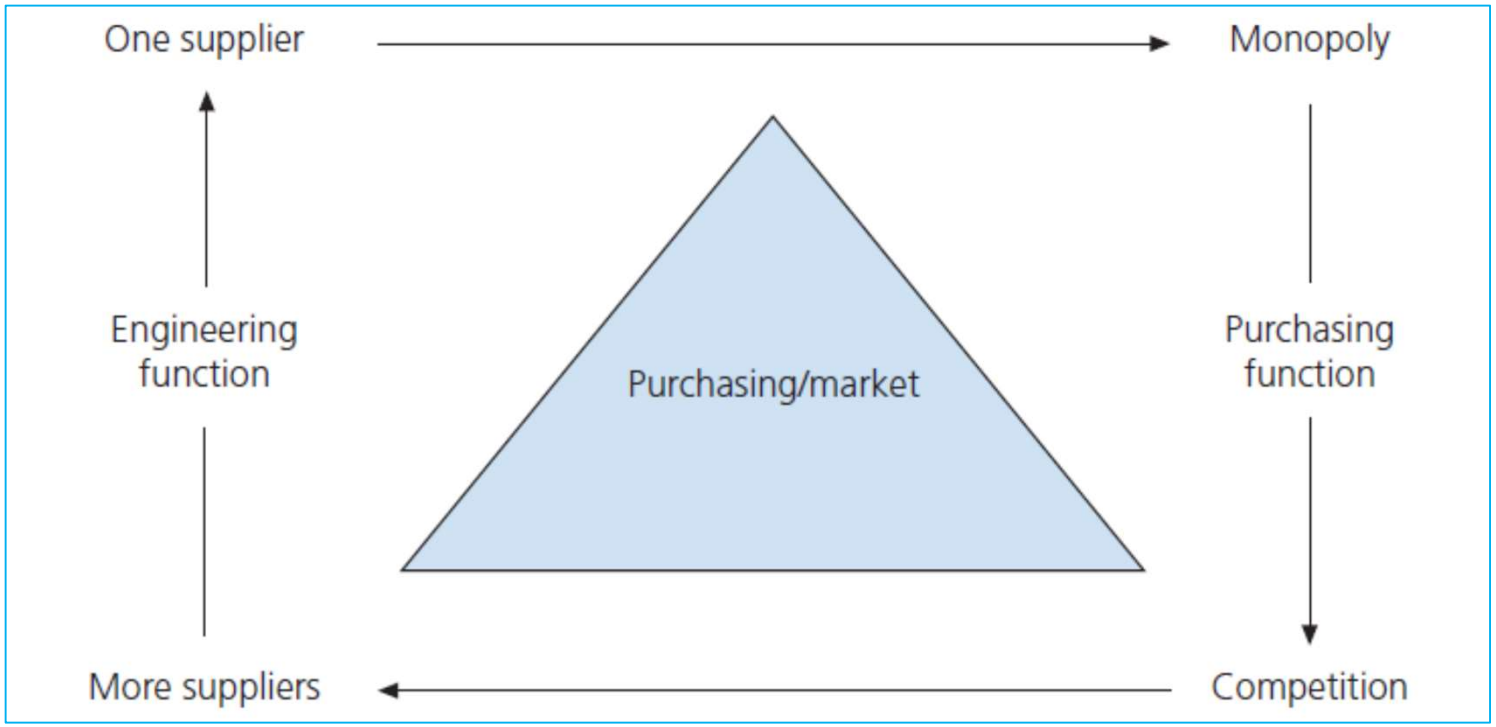


Purchasing and new product development

How do large manufacturers communicate with their first tier suppliers in product development projects?

- **Purchasing engineering**
  A specialist function to provide the liaison between the engineering department and the purchasing department.
- **Early supplier involvement (ESI)**
  Best-in-class suppliers are invited to participate in the company's product/process development projects at an early stage.
- **Residential engineering**
  Engineers from the other party are located on a more or less permanent basis within the organization.

Figure 10.5 Interaction between purchasing and engineering activities

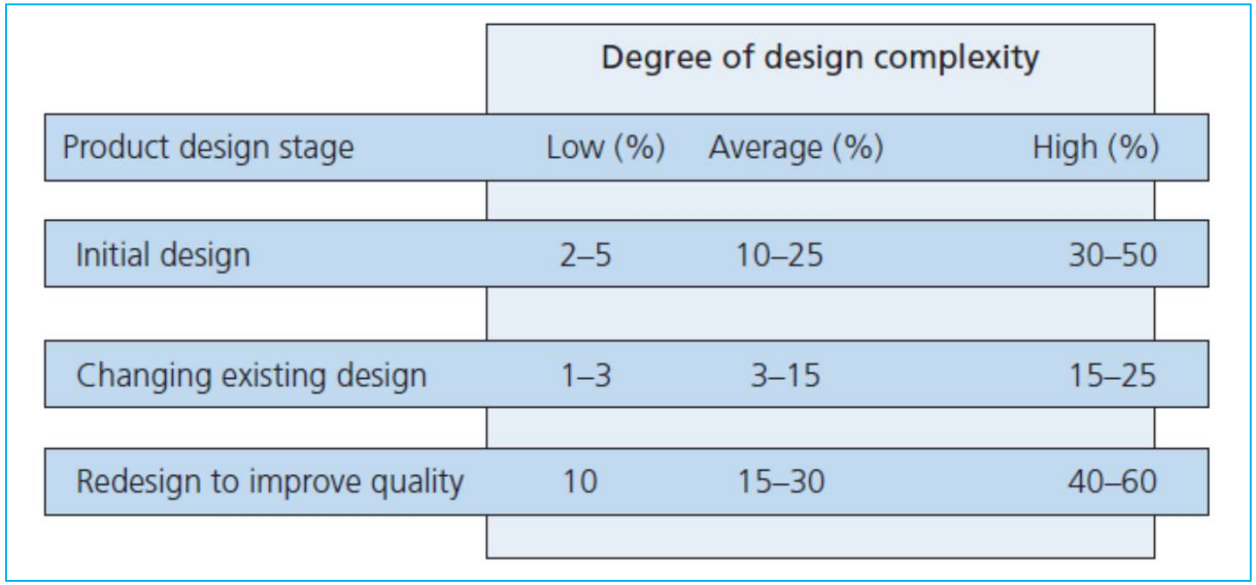


Conflicting interest between purchasing and engineering activities…

Purchasing and new product development

- Involving buyers in development processes at an early stage can result in contribution of new knowledge and better understanding of:
  - Construction
  - Suitable materials
  - Suppliers
  - Supplier knowledge
- Involving the supplier in new product development can also result in **considerable savings.**

Figure 10.6 Early supplier involvement may lead to significantcost reductions

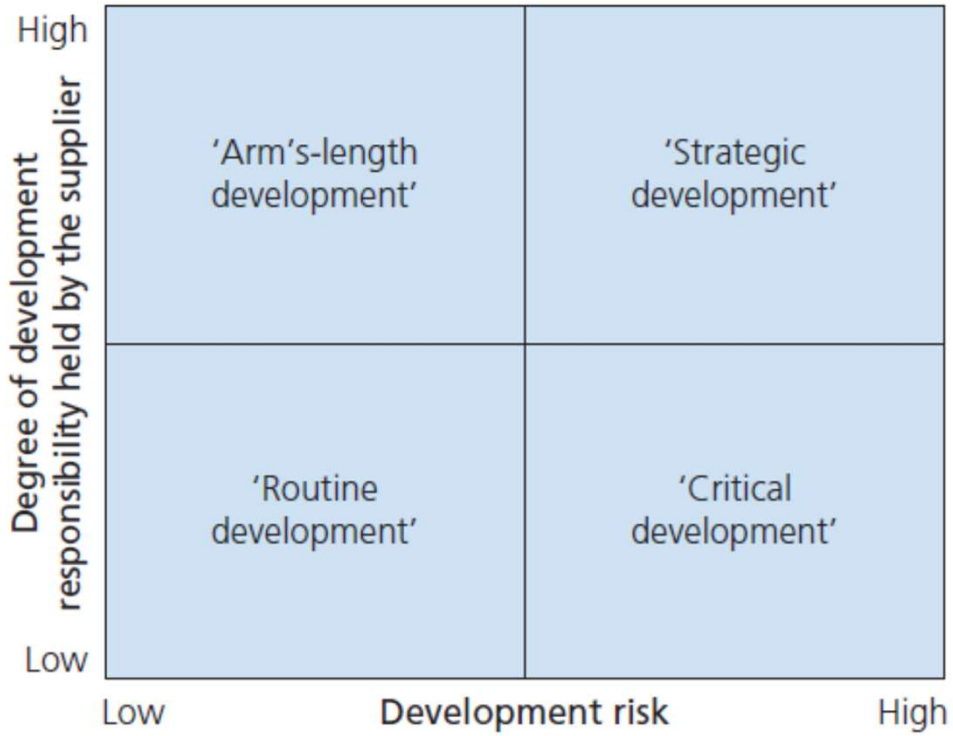


	Degree of design complexity		
Product design stage	Low (%)	Average (%)	High (%)
Initial design	2–5	10–25	30–50
Changing existing design	1–3	3–15	15–25
Redesign to improve quality	10	15–30	40–60

Early supplier involvement may lead to significant cost reductions

Figure 10.7 Supplier development portfolio

Source: Wynstra et al. (2000).



Purchasing and quality management

- IBM defines quality as:
  - Quality is the degree in which customer requirements are met. We speak of a quality product or quality service when both supplier and customer agree on requirements and these requirements are met.
- Quality control: making sure that the requirements are met and being able to demonstrate this objectively.

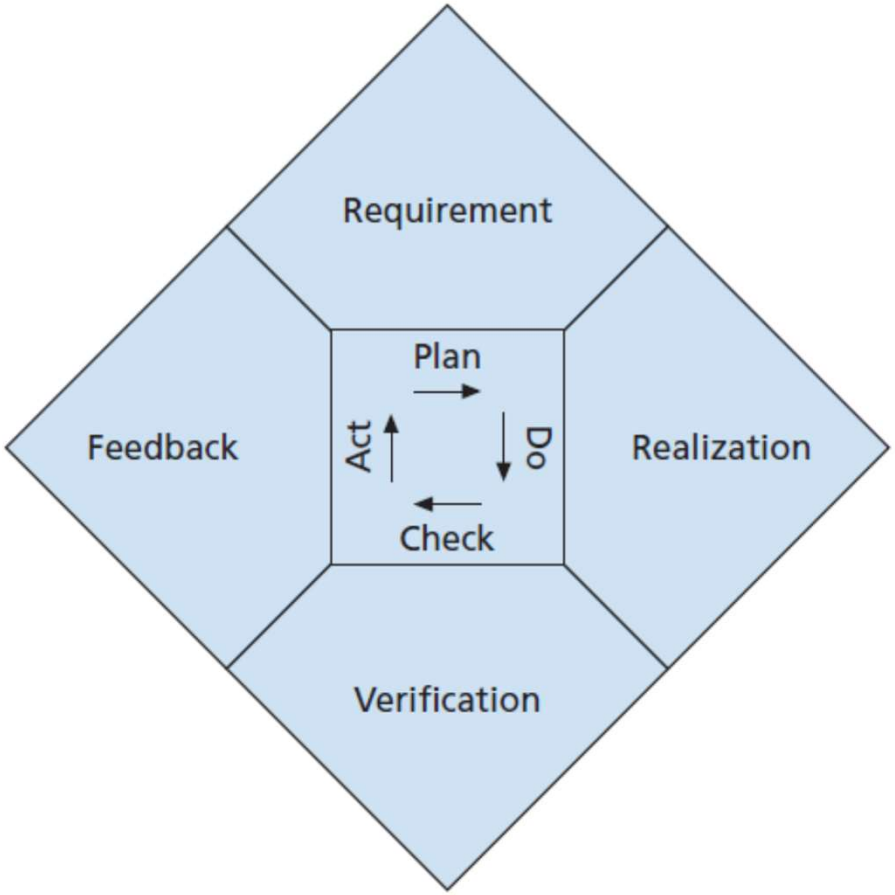
Purchasing and quality management

For every transaction between customer and supplier, they need to agree on:

- the basic requirements of the transaction.
- the way in which the requirements are to be realized.
- how to check that the requirements are (being) fulfilled.
- the measures to be taken when the requirements/expectations are not met.

Quality assurance concerns keeping methods and procedures of quality control up to date

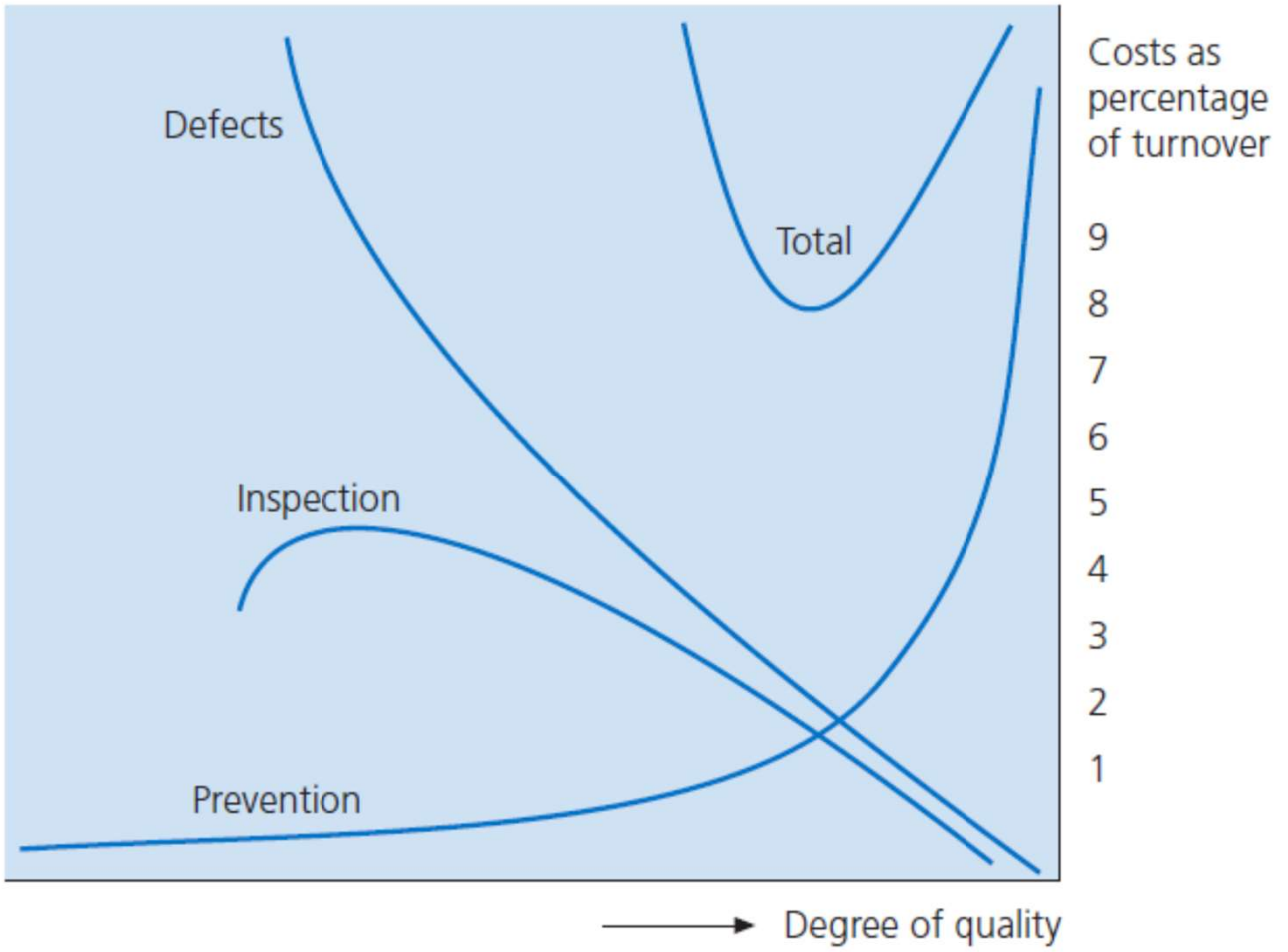
Figure 10.8 The plan–do–check–act cycle



The cost of quality

1) Prevention costs - the costs of preventing quality errors
2) Assessment costs - the costs related to the timely recognition of quality errors
3) Correction costs - the cost that result from (rectifying) mistakes
   - Internal error costs: result from mistakes noticed in time
   - External error costs: are result of flaws identified by the customer

Figure 10.9 The quality costs model



Supplier quality assurance (SQA)

- Internal quality assurance regarding suppliers
  - Preparing the purchase order specification
  - Preliminary qualification of (potential) suppliers
  - Sample inspection procedure
  - Delivery of first and subsequent preproduction series
  - Manufacture of the first production series
  - Quality agreement and certification
  - Periodic verification

Assessing supplier quality

Methods for assessing a supplier's capabilities:

- **Product audit**
  Provides an image of the degree in which a company succeeds in making everything run perfectly by inspecting final products.
- **Process audit**
  A systematic investigation of the extent to which the (technical) processes are capable of meeting the standards.
- **Systems audit**
  Compares the quality system to external standards (e.g. ISO 9000).

Assessing supplier quality: diagnostic methods

The ISO 9000 series of quality assurance standards

TABLE 10.1 The ISO 9000 series of quality assurance standards

There are many standards in the ISO 9000 family, including:

ISO 9001: 2008	Sets out the requirements of a quality management system
ISO 9000: 2005	Covers the basic concepts and language
ISO 9004: 2009	Focuses on how to make a quality management system more efficient and effective
ISO 19011: 2011	Sets out guidance on internal and external audits of quality management systems.

Source: http://www.iso.org/iso/home/standards/management-standards/iso_9000.htm

Implementing supplier quality assurance: consequences for purchasing

The most important changes to be prepared for by purchasing:

- Clear task descriptions and performance measures
  - Maximum rejection percentage per article code or per supplier
  - The average term in which rejection reports must be dealt with (per buyer)
  - Number of quality agreements closed with suppliers
  - Number of certified suppliers
- Clarity concerning supplier selection
  - Who in the company is competent to enter into relationships with suppliers?
  - Who is responsible for ultimate selection of suppliers?
  - Communication to suppliers from one central point (supplier account management)
- Quality first
  - Take responsibility for quality and being accountable
  - Rejection percentages and number of quality agreements becoming part of the buyer's annual assessment
- To measure is to know
  - Essential that suppliers receive feedback on their performance (e.g. vendor rating system)

Summary

- There is an interfaces between purchasing, new product innovation and quality assurance.
- Competition forces companies to speed up their innovation processes.
  - The challenge, however, is how to mobilise a supplier's innovation potential.
- A question to consider is what supplier to involve at what stage of the new product development process.
- Buyers are important scouts when it comes to spotting new technological developments that occur in the supplier market.
- The product design is the basis for product quality.