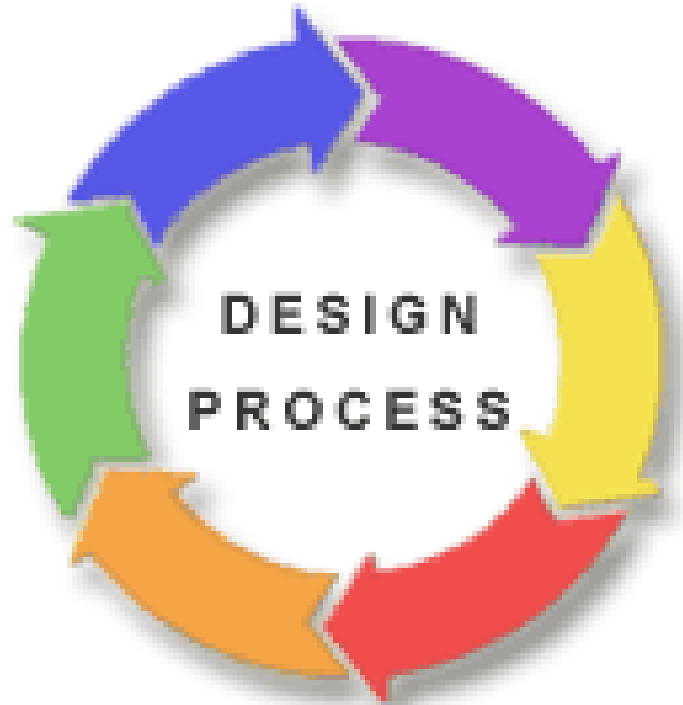
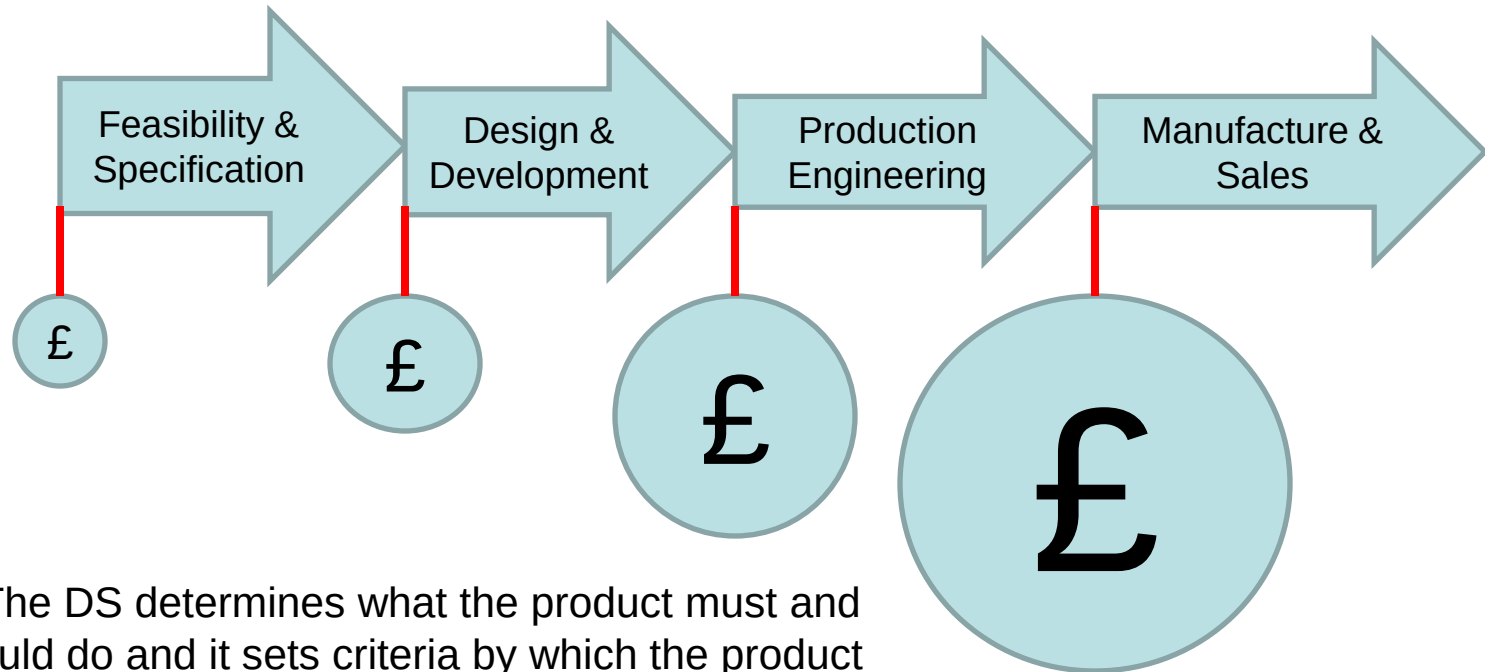


Design Specification *&* *The Kano Model of Quality*



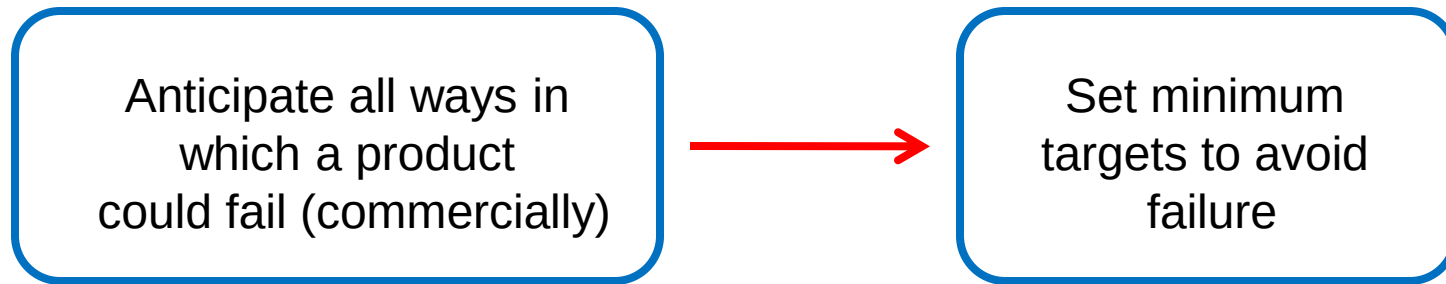
Why Create a Design Specification?

- ❑ The Design Specification (DS) is the key document against which designs are evaluated throughout the design process.



- ❑ The DS determines what the product must and should do and it sets criteria by which the product is either allowed to continue on its development or be 'killed off' during quality control reviews.
- ❑ It should also be a useful and helpful guide to the designer/design team to ensure that nothing is omitted from the product during its development

Why Create a Design Specification?



- ☐ Will it sell?
- ☐ Will it work?
- ☐ Can it be manufactured?
- ☐ Does it comply with legal / commercial legislation

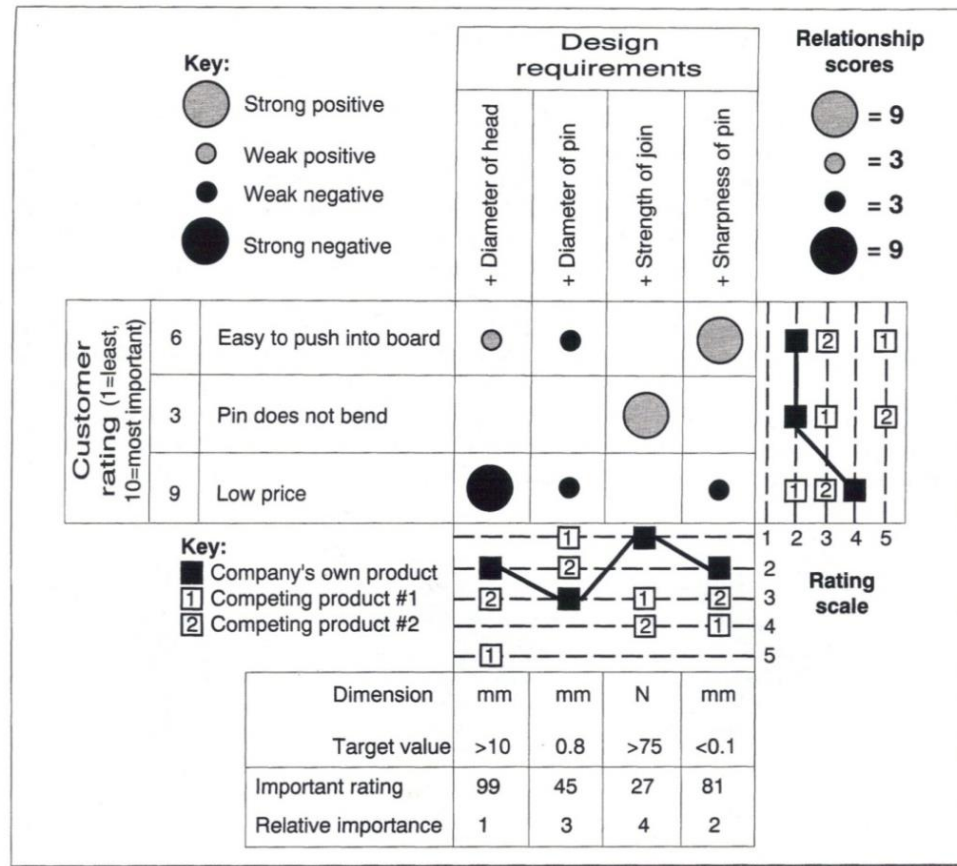
Preparation for Design Specification

Customer wants
& desires

QFD



Design
Requirements



Product Quality & Adding Value

What does quality mean?

The engineer



- ✓ Fitness for purpose
- ✓ Failure conditions exceed operating conditions
- ✓ Factors of safety

The production manager



- ✓ Ease of which the product can be manufactured to specs
- ✓ Measures of quality (proportion of products meeting specs)

- ✓ Maintenance-free operating life
- ✓ Cost of repair/maintenance
- ✓ Difficulty of servicing/maintenance

The service engineer/technician

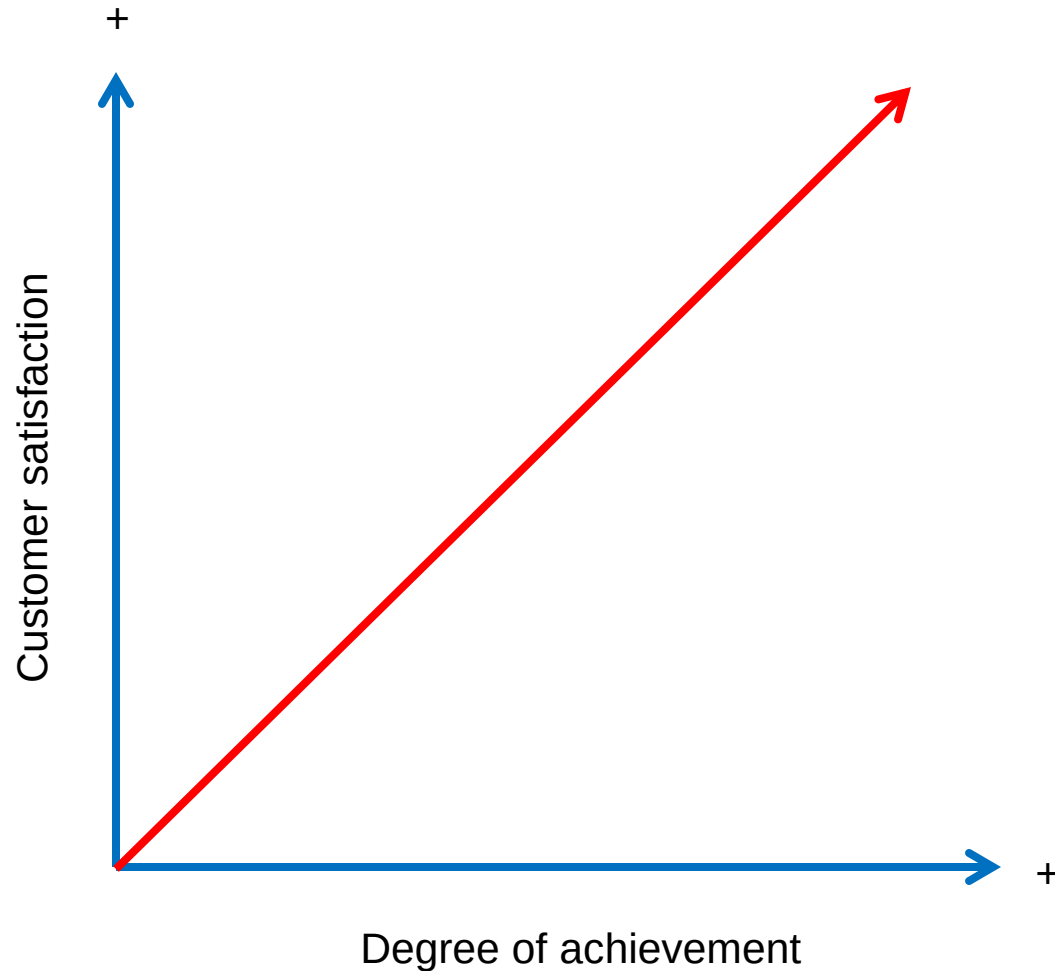


The 'customer'



- ✓ Cost (purchase/running)
- ✓ Functionality
- ✓ Reliability
- ✓ Ease of use
- etc....

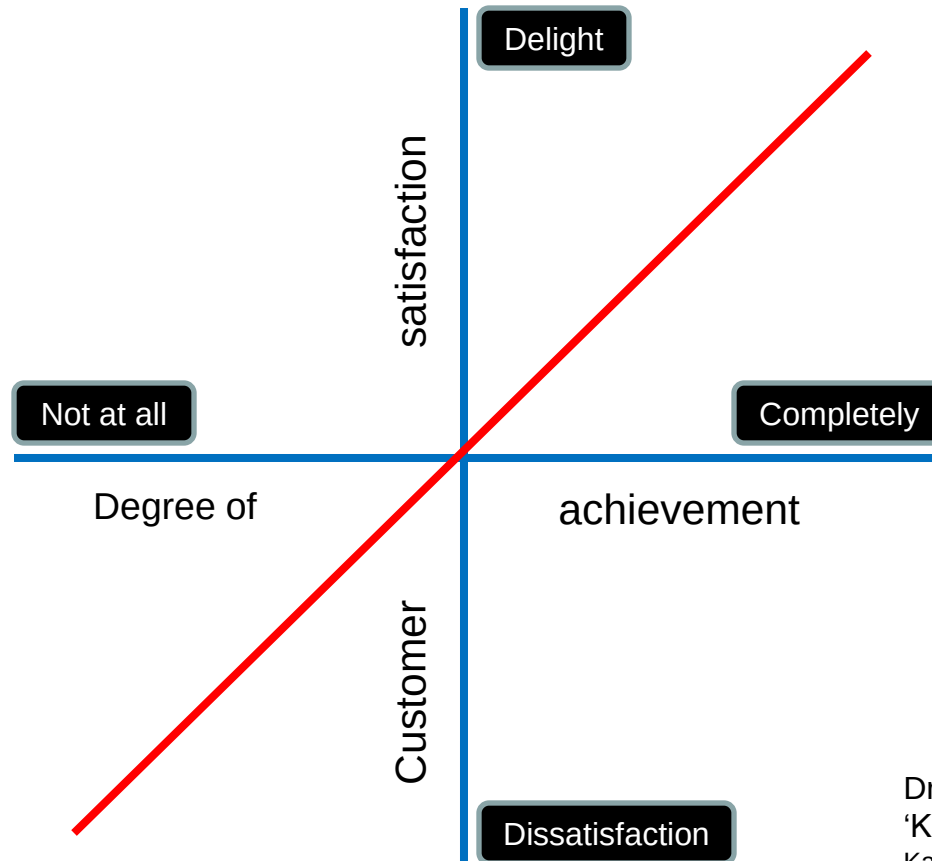
A simple model of quality



A refined model of quality

'Performance' needs

- 'Spoken' needs and wishes for features familiar from competing products
- Readily accessible to market research
- Generally additive in producing customer satisfaction
- Low achievement of performance factors can give rise to customer dissatisfaction

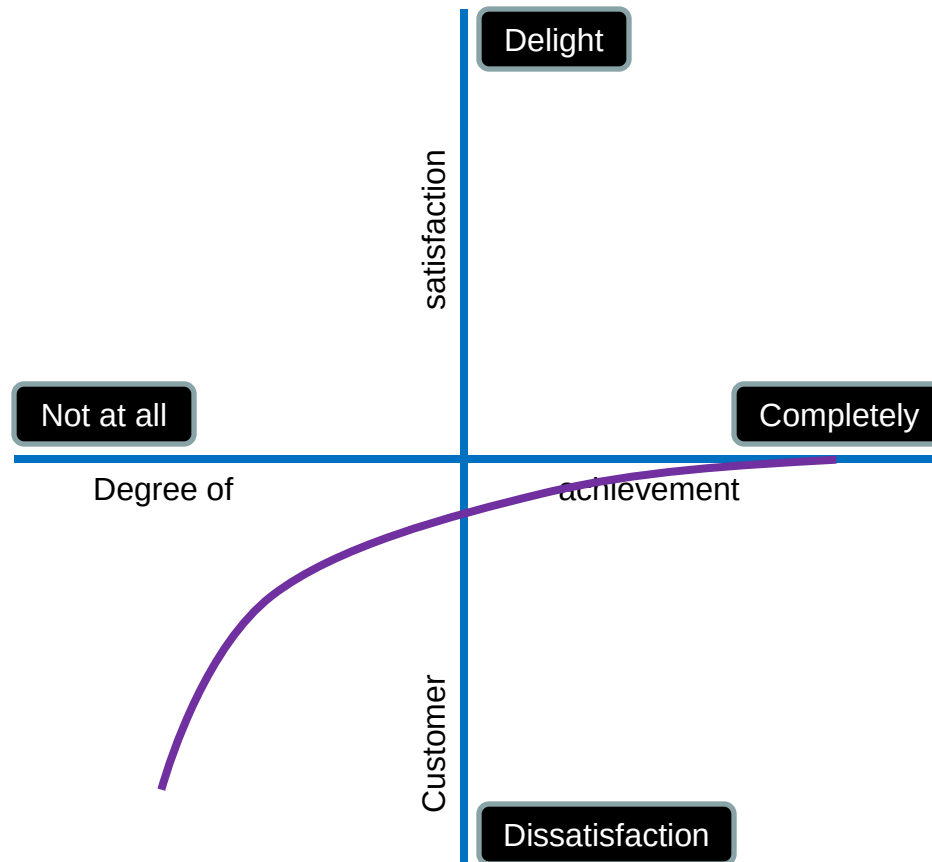


Dr. Noriaki Kano developed the 'Kano' model of quality
Kano, N. (1992) Quality Function Deployment: Practitioner Manual, American Supplier Institute, Dearbourn, Michigan pp 5-6.

'Basic' aspects of quality

'Basic' needs

- 'Unspoken' needs and wishes for features typical, and expected from, competing products
- Difficult to discover through market research

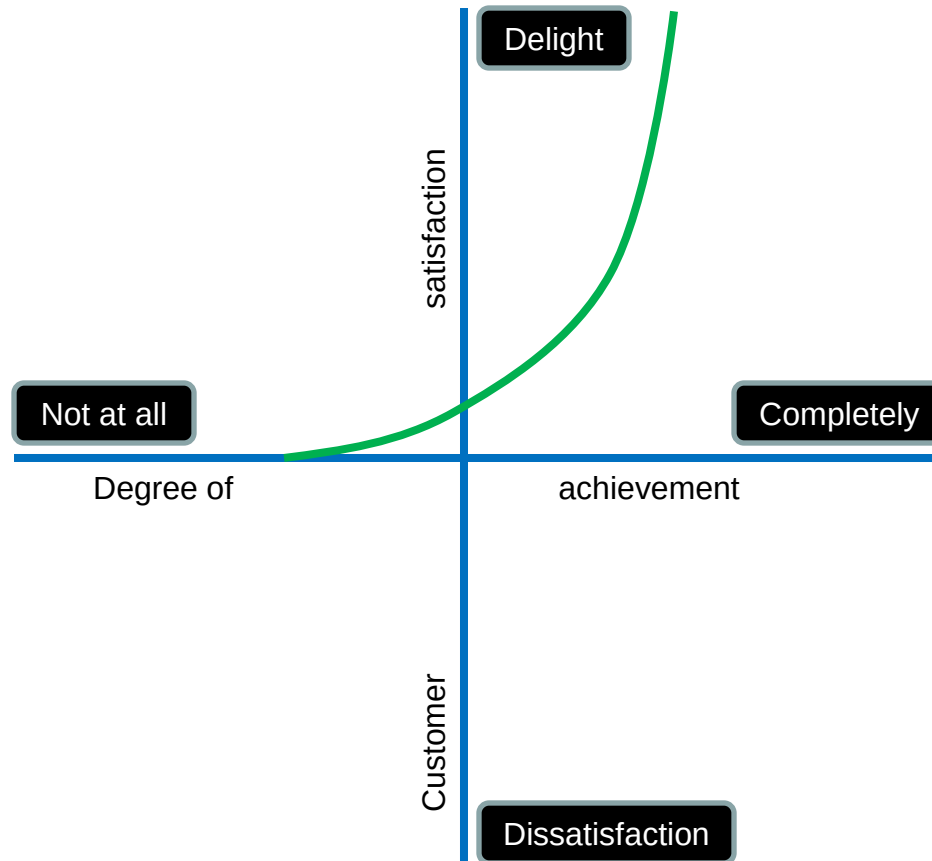


- Discovered by competing product analysis
- Failure to achieve any basic needs will lead to customer dissatisfaction

'Excitement' aspects of quality

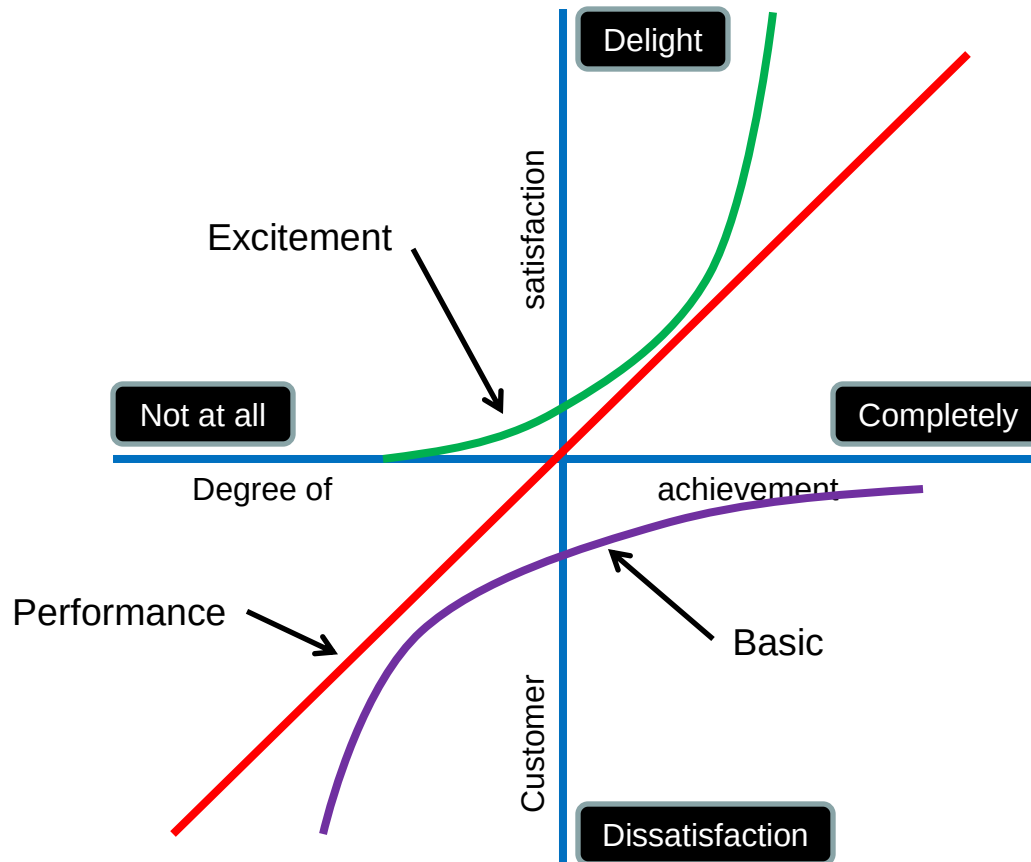
'Excitement' needs

- 'Unspoken', latent customer needs and wishes unprecedented in competing products
- Satisfying genuine needs, they are not just gimmicks



- Extrapolated from market research aimed at understanding of customer's underlying wishes and their unresolved frustrations with existing products
- Failure to achieve excitement factors does not lead to customer dissatisfaction
- Difficult to discover through market research

'Kano' model of quality



Preparing the Design Specification

There are 4 main steps in the preparation of a design specification:

- 1) Review and finalise the commercial objectives for the product from the opportunity specification.
- 2) Conduct design specification briefings with key staff involved in the product development and subsequent product management after the product is launched
- 3) Draft the design specification
- 4) Review the draft design specification with the key staff briefed earlier and finalise it

Typical Headings for a Design Specification

Market requirements

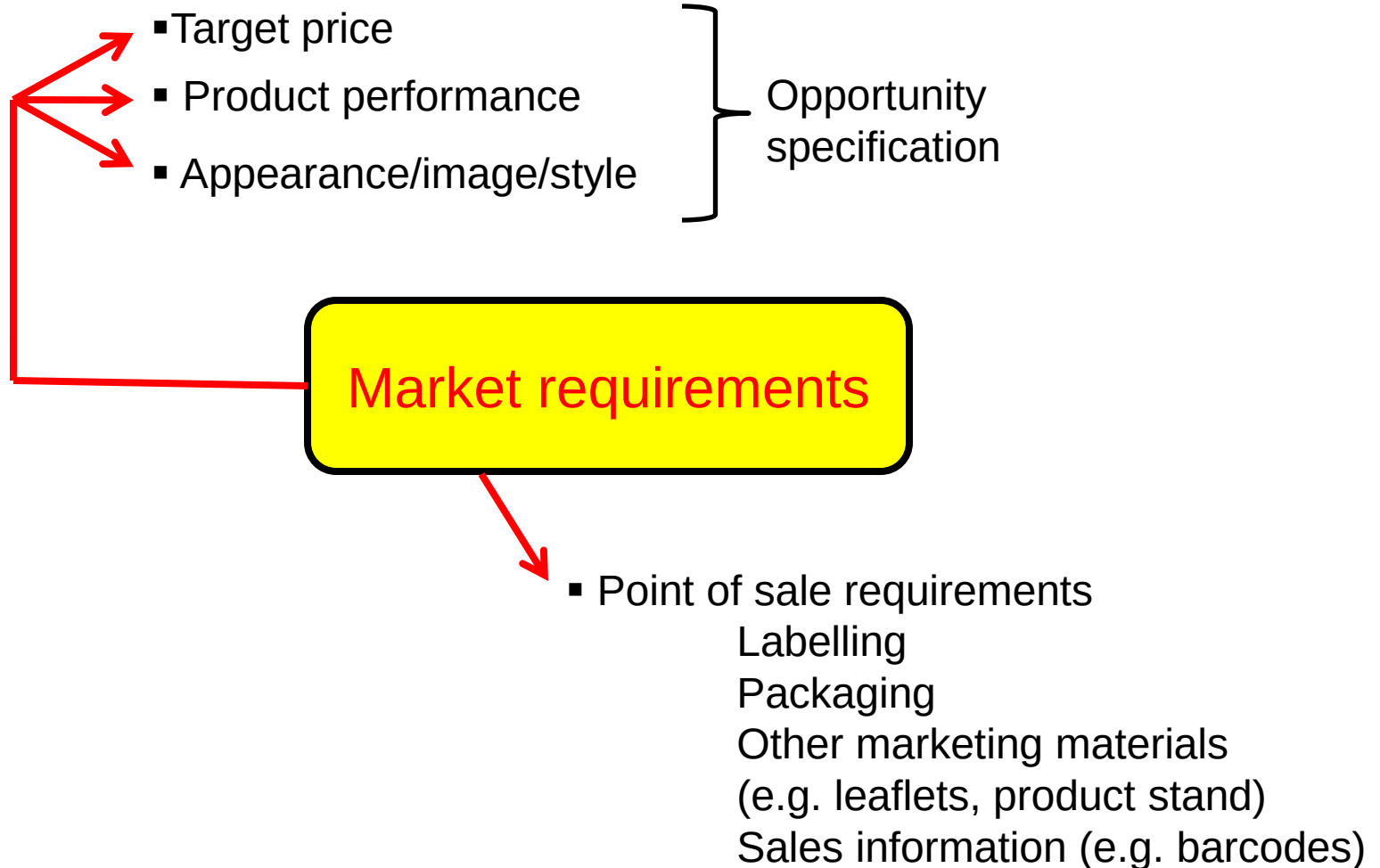
Life in service
requirements

Production
requirements

Conformance
requirements

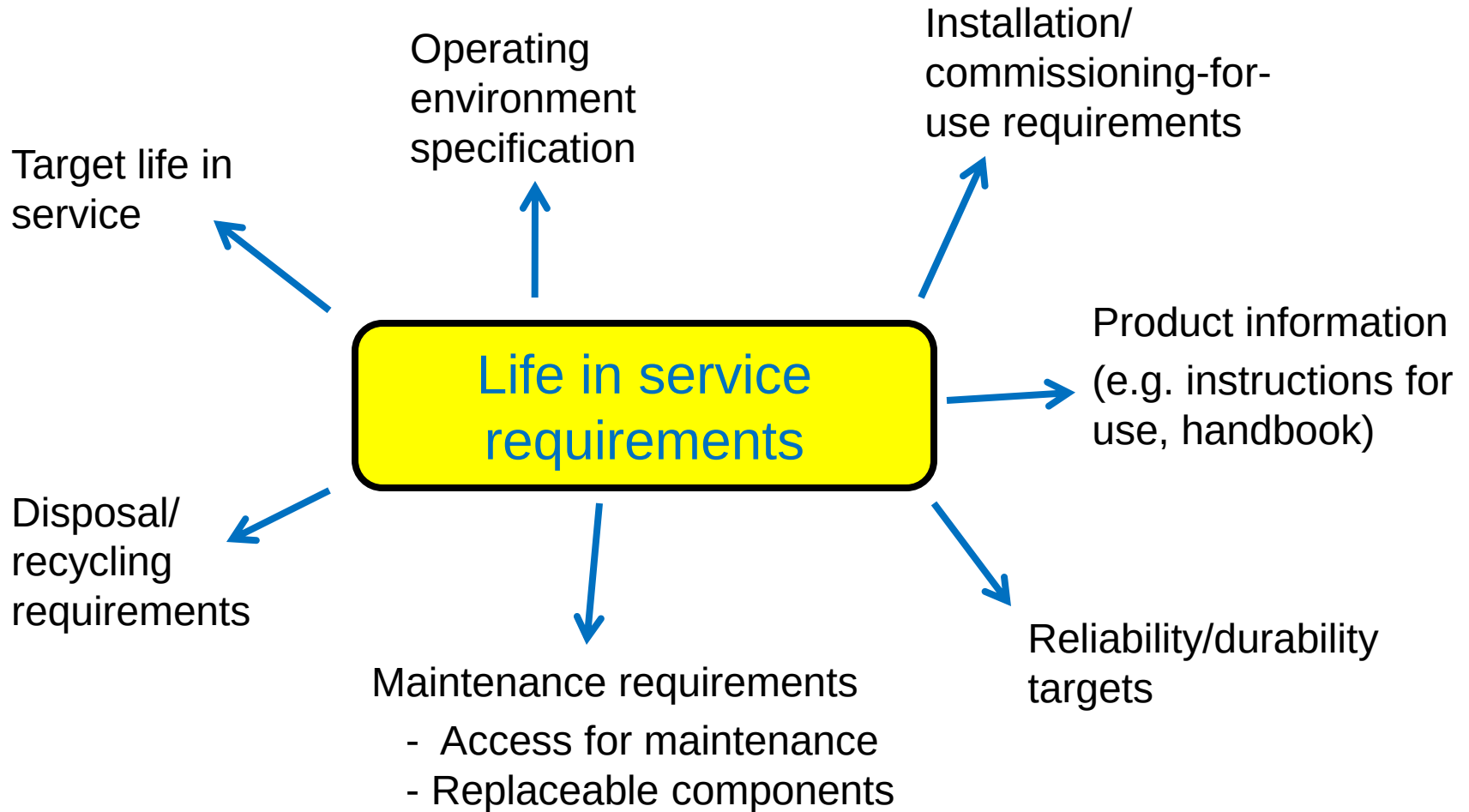
Market requirements

Check: Are these sufficient to ensure that the product will sell?



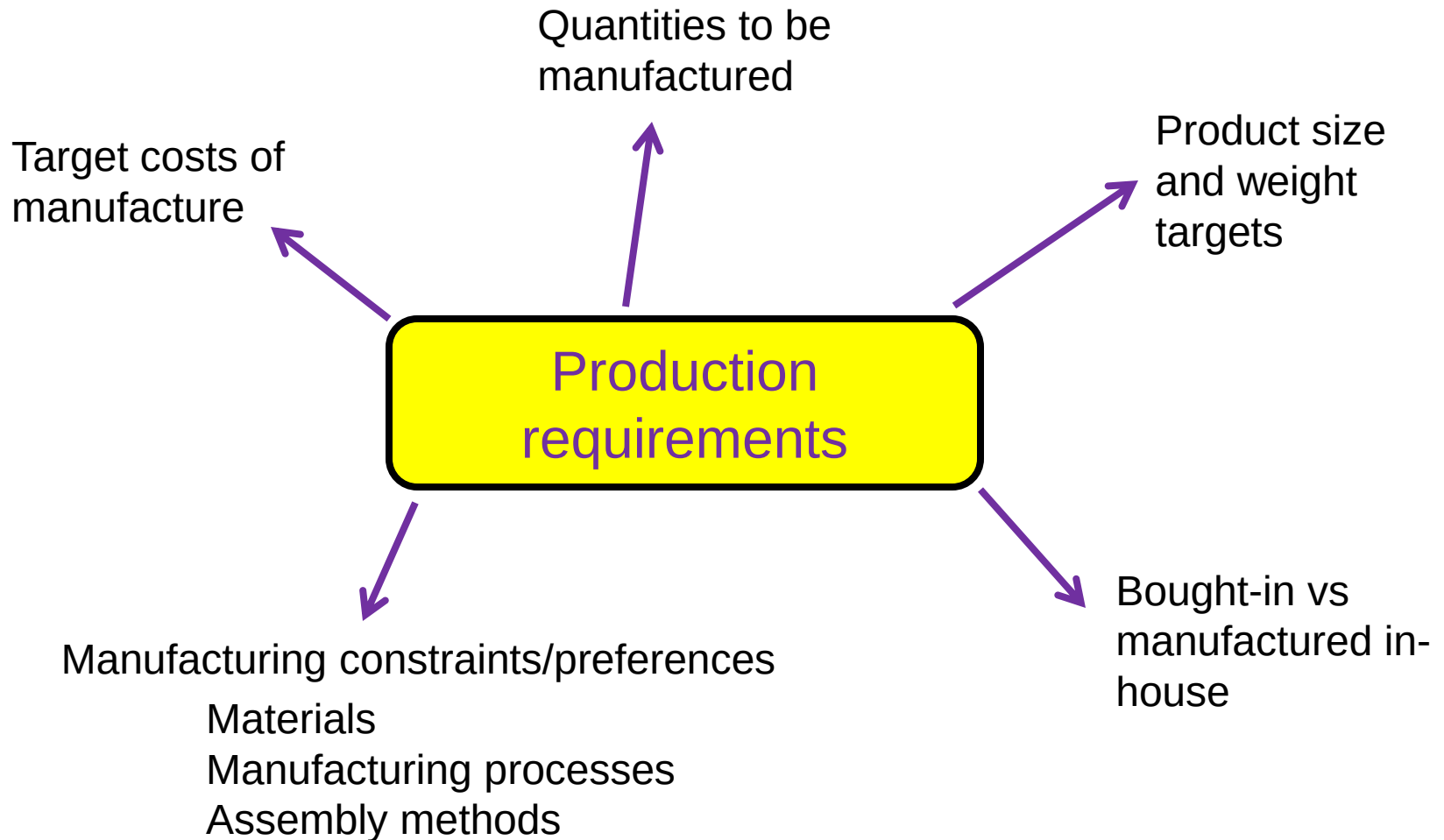
Life in service requirements

Check: Are these sufficient to ensure that the product will work?



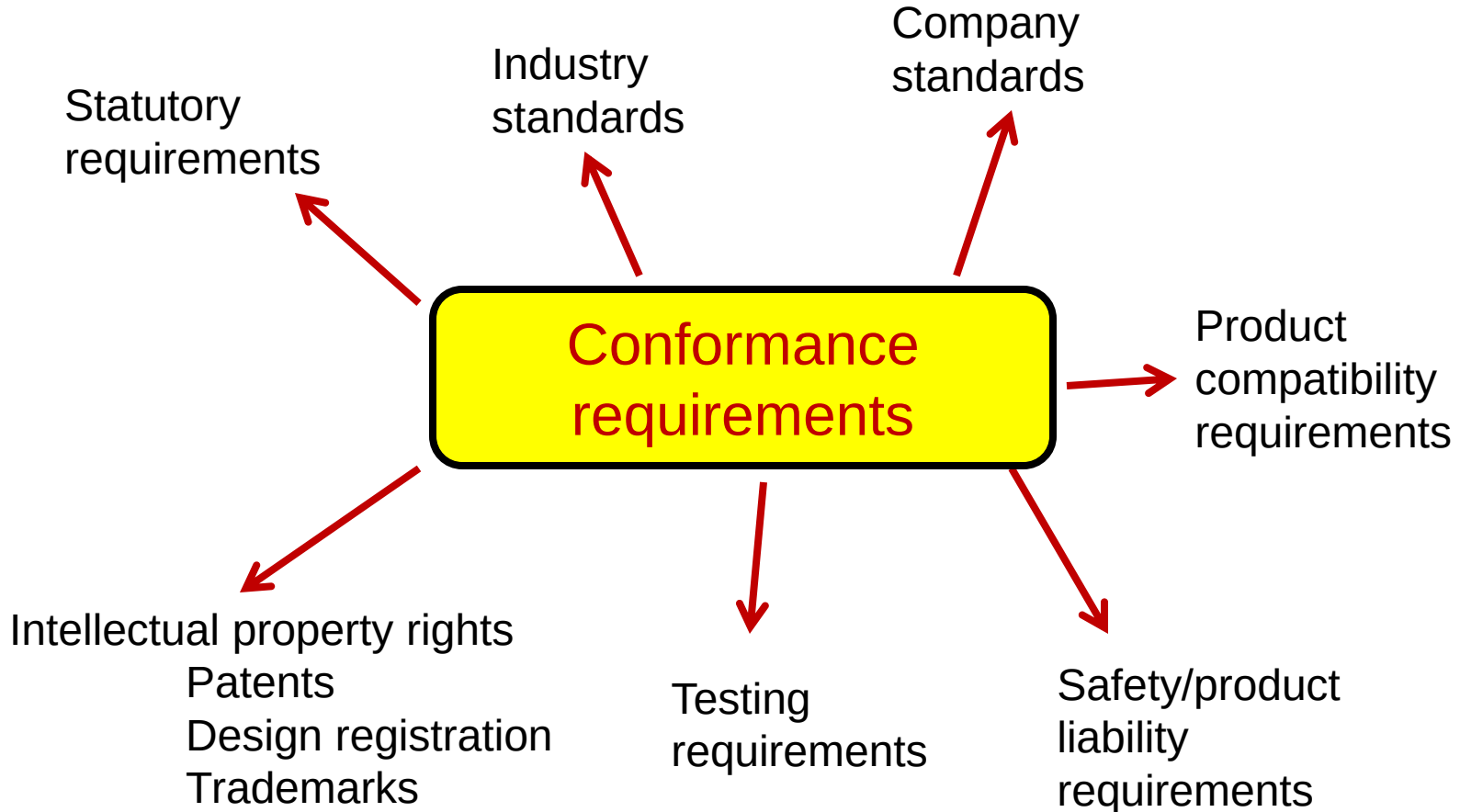
Production requirements

Check: Are these sufficient to ensure that the product can be made?



Conformance requirements

Check: Are these sufficient to ensure that the product will comply with all legal and commercial obligations?



Preparing the Design Specification

The Briefing Form

Proposed Product: Information from:		Designer: Date:	
Product requirement	Demand or wish	Type of requirement	Basic/perf./excite ment
Requirement # 1			
Requirement # 2			
Requirement # 3			
Requirement # 4			

Preparing the Design Specification

The Draft Design Specification

Proposed Project: Date:		Designer/Engineer:
Performance requirement	Design requirement	Design specification
Must be easy to transport	Must be light weight	< 5kg
Must be affordable	Must be low cost	<£100.00 (purchase price)