

# Subject- Operations Management

Topic- DFM, DFA,DFMA and DFE

Lecture Notes

Mrs. Anjali Upadhyay  
Mechanical Engineering Department  
SoET, VU, Ujjain

# Design for Manufacturing (DFM)

- Process of designing parts, components or products for ease of manufacturing.
- Implies towards best process, optimized cost, tolerances and best material.
- Goal is
  - To reduce or eliminate complex features.
  - Eliminate unnecessary parts/features.
  - To reduce manufacturing cost.
  - To smoothen manufacturing process.
- DFM- Product design for ease of manufacture of parts

# Design for Assembly (DFA)

- DFA implies towards product simplification because the cost of assembly is directly proportional to number of parts.
- Eliminating or reducing parts.
- Reduced assembly time.
- Low cost and easy assembly.
- DFA- Product design for ease of assembly.

# Similarities between DFM and DFA

1. Reduced material
2. Reduced overhead
3. Reduced labour cost
4. Reduced product development cycle time
5. Reduced cost

# Differences between DFM and DFA

	DFM	DFA
Optimization	Process optimization	Assembly optimization
Objective	Reduce part production	Reduce product assembly cost
Outcomefocus	Reducing manufacturing operations complexity	Reducing assembly operations
Ease factor	Ease of manufacturing product	Ease of assembling product

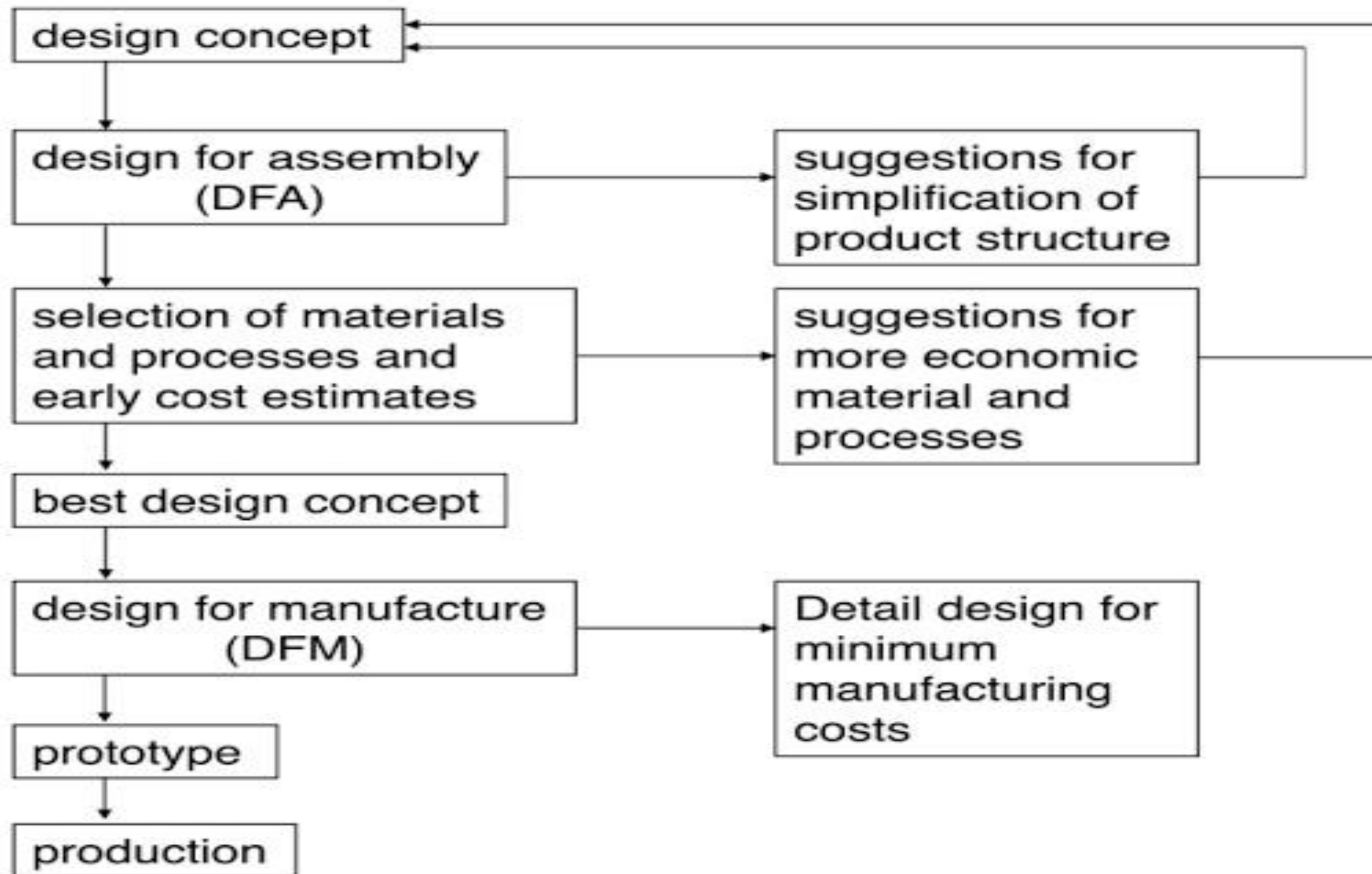
# Design for Manufacturing and Assembly (DFMA)

- DFMA is the combination of DFM and DFA.
- Focus on simplifying product with manufacturing ease and efficient assembly.
- Minimum Time (Shorter time to market)
- Lower cost
- Increased reliability

# Principles of DFMA

- Make multi functioned parts
- Minimize parts
- Simplify/optimize manufacturing process.
- Eliminate interfaces
- Use standard components
- Ease in handling
- Minimize reorientation during machining or assembly
- Encourages concurrent engineering
- Take advantage of modular assembly

# DFMA Methodology

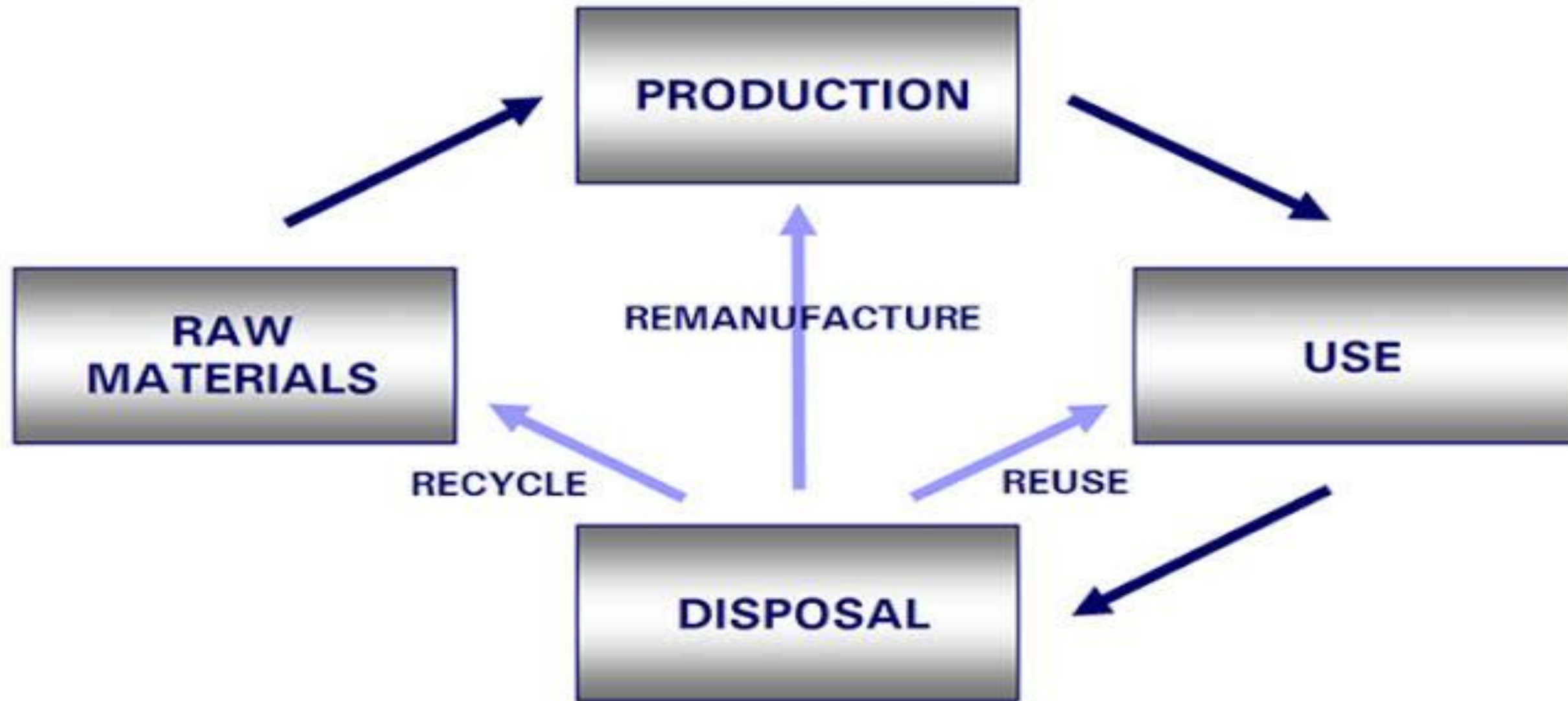


# Design for Environment

- Focus on reducing overall environmental impact or the impacts associated with human health across the life cycle of product.
- DFE takes recycling, reuse and remanufacturing in account.
- It is also known as Eco design.
- A design towards sustainability.



# DFE



- DFE relies on:

- 1.manufacture without producing hazardous waste

- 2.Cean technology

- 3.reduce chemical emissions

- 4.reduce energy consumption

- 5.use non-hazardous materials

Use recyclable materials

- 6.reuse components

- 7.Design for ease of disassembly

8. recycle/reuse at end of life