

School of Mechanical Engineering

Course Code : MCDM5004

Course Name: Product Design and Life cycle Management

UNIT IV

Producibility and Reliability

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PRODUCIBILITY

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Strategies in design for manufacturing

Producibility

- **Producibility** is a discipline directed toward achieving design requirements that are compatible with available capabilities and realities of manufacturing.
- This starts early in requirement definition and continues throughout a product's useful life.
- Providing accurate, timely and quantified manufacturing and vendor information is essential to make accurate producibility decision.

Best Practices

- Producibility Infrastructure and Process
- Producibility Requirements Are Used for Optimizing Design and Manufacturing Decisions
- Consider Company's Business and Manufacturing Environment
- Knowledge and Lessons Learned Databases
- Competitive Benchmarking
- Process Capability Information
- Process Capability Studies and Design of Experiments
- Manufacturing Failure Mode Analysis (PFMEA)
- Producibility Analyses, Methods and Practices
- Design Reliability, Quality and Testability

Measurement Of Producibility

- ❖ Can be measured in terms of cost, lead-time, quality and technical risk.

Producibility analyses include

1. cost :

- Total manufacturing cost
- Part and vendor cost
- Direct labor cost to build a product
- Complexity

Number of parts, parameters, features, etc.

Level of precision required

2. Schedule or leadtime :

- Manufacturing and /or purchased part lead time
- Total product lead time including ordering and shipping

3. Quality :

- Projected number of defects or yields, Cp and Cpk
- Cost of quality (prevention, measurement, and warranties)
- Variance of critical parameters

4. Technical risk:

- Number of new technologies, parts, vendors and processes
- New or never before achieved levels of requirements

The key producibility Recommendations for both design and manufacturing

- Concentrate on key design parameters (i.e. key characteristics)
- Develop design parameters that are "robust" to variation
- Minimize design complexity
- Optimize design parameters for manufacturing process and assembly.

PRODUCIBILITY PROCESS

Articles on the success of Japanese manufacturing have mentioned a 40:30:30 percentage rule on the reasons for quality problems.

- 40% of all quality problems are the result of **poor design**
- 30% are the result of **problems in manufacturing**
- 30% are the result of **nonconforming materials and parts supplied by outside vendors.**

References

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Thank you

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