

SKF4153- PLANT DESIGN

5Ms CONCEPT

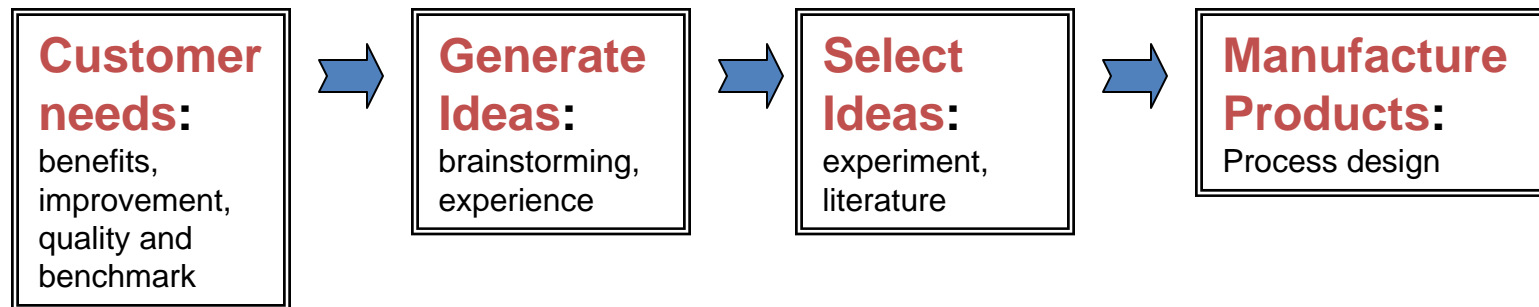
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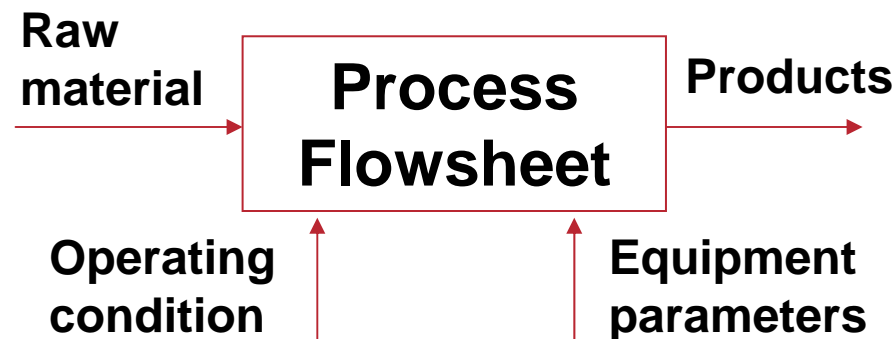


PRODUCT DESIGN VS. PROCESS DESIGN

- ❖ Product design: decision made before process design.
- ❖ Response to major changes: safe, economical, sustainable, demand, environmentally friendly, etc.
- ❖ Steps in Product Design:



Reference: W.D. Seider, J.D. Seider, D.R. Lewin, Product and Process Design Principles: Synthesis, Analysis and Evaluation, John Wiley and Sons, Inc., 2010.



...is the field of study that involves the process of converting resources into value-added products

Believe it, or not...

Each of us have some
process design
experience!!!



Let's make Biryani

We need 5M!

- **Materials** – ingredients and the product (what, how much, where, cost) ?
- **Method** (steps, procedures...any recipe? Own recipe?...or process (of making..))
- **Machinery** (what, how big?, how many, where, cost, any tools already available?, any new one? limitations)
- **Manpower** (skill required? how many? who?, who to do what (job-spec)?
- **Money** (profit, net income?)

Home-Made to Commercial Product

- ❖ Biryani demand has suddenly increased.
- ❖ The Challenge is to produce export-quality Biryani!
- ❖ Think of other key considerations to convert the home-based process into commercial production.

HOW TO ACHIEVE SUSTAINABILITY

- ❖ Sustainable: Economic, low environmental impact, low waste, efficient operation, correct raw material,
- ❖ Generate alternatives that improve the operability, energy consumption, waste reduction, environmental impact, safety, cost,
- ❖ Achieve sustainability without compromising ethics.
- ❖ Consequences of not being ethical.....self, public, environment, etc.

IN-CLASS ACTIVITY

- Think of one food-based product on high market demand.
- List down the 5 Ms based on the home-made and the industrial scale production.
- What would your team do to increase the profit on sales?
- How your team practices responsibility to the environment and society?

WHAT YOU'VE LEARNED

- ❖ The concepts of product and process design.
- ❖ Creating a process through 5 Ms strategy.
- ❖ Sustainable process design.
- ❖ Ethics and sustainability.

References

- G.D. Ulrich, Process Plant Design and Economics, John Wiley, 1984.
- J.M. Douglas, Conceptual Design of Chemical Processes, McGraw Hill, 1998.
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