ME 410 Lecture 4

Lecture Outline

I. Value Stream Mapping
II. Present State Map
III. Process Improvement Strategies
IV. Takt Time
V. Future State Value Stream Map

Value Stream Mapping

- **Lean Manufacturing is "A systematic approach to identifying and eliminating waste."**
- **Lean Manufacturing "emphasizes flowing the product at the pull of the customer".**

Value Stream Mapping Icons and Terms

- Developed by product family.
- Shows flow of both material and information.
- **Present State Map.** A value stream map of the current (existing) state of the manufacturing process.
- **Future State Map.** A value stream map of the goal state.
- **Icons and Terms:**
  - **Process Box.** Each process group, where inventory exist before and after.
  - **Data Box.** Accompanies process box and give relevant process data.
  - **Inventory Triangle.** Records/indicates locations and amount of inventory.
  - **Push Arrow.** A striped arrow indicating material flow via a push.
  - **Lead Time Bar.** Gives the lead times and value-added times for each process.
- **Strategies for Process Improvement:**
  - ***Establish a Takt time.*** **Takt time** is the demand rate (work time available/number of units sold).
  - ***Develop Continuous flow wherever possible.*** **Continuous flow** refers to producing one piece at a time, with each item passed immediately from on process step to the next without stagnation.
  - ***Use supermarkets if continuous flow is not possible.*** **Supermarkets** control production at supplying process without scheduling. Typically, a "production" Kanban triggers production of parts, while a "withdrawal" Kanban is a shopping list that instructs the material handler to get and transfer parts.
  - ***Try to send customer schedule to only one production process.*** **A pacemaker process** is is a single process point in the value stream that sets the production pace for the entire process. Downstream processes thus follow a pull system (typically with Kanban cards) rather than produce to a schedule).
  - ***Load-level production.*** **Load-leveling** means distributing the production of different products evenly over a time period, creating a product "mix".
  - ***Release/withdraw a small, consistent increment of work to the pacemaker process.*** This work increment is called the "**Pitch**".