What is JIT?

- A management approach
- Producing only what is needed, at the time it is needed, and the amount needed
- An integrated management system
- JIT’s mandate: *Eliminate waste*
- “Kanban systems” - an example implementation strategy of the JIT concept

Examples of Waste

- Idle machine run
- Waiting for parts
- Counting parts
- Overproduction
- Moving parts over long distances
- Storing inventory
- Looking for tools
- Machine breakdown
- Rework

Elements of JIT

- Pull production concept
- Flexible resources
- Cellular manufacturing
- Kanban production control
- Small-lot production
- Quick setups
- High quality
- Supplier networks

Pull vs Push System

**Push**
- Forecast driven
- Larger lot sizes (based on EOQ)
- Fast response to changes in production demand

**Pull**
- Demand driven
- Small lot sizes
- Slow response to changes in production demand
Kanban Systems

*Lost its glamour?*

The first kanban system was applied by Taiichi Ohno in Toyota around 1953 to:

- Reduce inventory and production cycle time
- Improve productivity

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Kanban and Kaizen

Kanban - a card (Japanese term)

vs

Kaizen - continuous improvement

- a concept different than Kanban
- problem solving by teams

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Push vs Pull Concept

![Push vs Pull Concept Diagram]

- Production plan
- Information flow
- Material flow
- Schedule

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Example Kanban

<table>
<thead>
<tr>
<th>Part No: 7412</th>
<th>Description: Slip rings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box capacity</td>
<td>25</td>
</tr>
<tr>
<td>From:</td>
<td>Box Type A</td>
</tr>
<tr>
<td>Machining</td>
<td>Issue No. 3/5</td>
</tr>
<tr>
<td>To: Assembly</td>
<td>A-4</td>
</tr>
</tbody>
</table>

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Functions of Kanbans

- Visibility function
- Production function
- Inventory function

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Kanban Squares

Marked area holding limited number of output items

Flow of work
Flow of information
Kanban Racks

To hold a limited number of items (e.g., 1 or 2)

Signal Kanban

Resembles the reorder point system (order components when inventory drops below the safety level)

Kanban Post Office