**Important characteristics of Project Management**

- forces detailed planning
- improves communications
- identifies potential problem areas
- provides management with timely progress reports
- offers ability to simulate effects of alternate decisions
- assists in long-range planning

**Example**

A company is about to introduce a new product (#3). One unit of product #3 is produced by assembling one unit of product #1 and one unit of product #2.

Before production begins on either product #1 or #2, raw materials must be purchased and workers must be trained.

Before products #1 & #2 can be assembled into product #3, the finished product #2 must be inspected.

**Network Models of a Project**

AOA: Activity on Arrow model  
The tasks (activities) are represented by arcs (arrows) in the network

AON: Activity on Node model  
The tasks (activities) are represented by the nodes in the network

**Tasks required for completion of project**

<table>
<thead>
<tr>
<th>task</th>
<th>predecessors</th>
<th>duration (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A = train workers</td>
<td>none</td>
<td>6</td>
</tr>
<tr>
<td>B = purchase raw materials</td>
<td>none</td>
<td>9</td>
</tr>
<tr>
<td>C = produce product #1</td>
<td>A,B</td>
<td>8</td>
</tr>
<tr>
<td>D = produce product #2</td>
<td>A,B</td>
<td>7</td>
</tr>
<tr>
<td>E = test product #2</td>
<td>D</td>
<td>10</td>
</tr>
<tr>
<td>F = assemble product #3</td>
<td>C,E</td>
<td>12</td>
</tr>
</tbody>
</table>

**Gantt Chart**

Each activity is represented by a bar, which specifies the beginning and ending of the activity.
What is the shortest time required for the production of product #3?

If the durations are known with certainty, the project completion time can be found using the Critical Path Method (CPM).

If the durations of the tasks are random, the project completion time can be estimated using the Program Evaluation & Review Technique (PERT).

- **CPM** - Critical Path Method
- **PERT** - Program Evaluation & Review Technique
- **SLAM** - Simulation of project
- **"Crashing"** - Reducing project completion time