Experience Learning Component 2

1. **Objective of problem:**

- To understand the significance of continuous production system.
- To understand and identify the significance differences between batch production and continuous production.

2. **Problem Statement**

An automobile ancillary industry is implementing the batch production system in one of the plant located in the western part of India. The manufacturing plant is producing crank shafts to their customer. The management of automobile ancillary industry has observed a huge work in process inventory in the production shops. The organization management has decided to upgrade the production process from the batch production to continuous production. They have given task to the expert team to implement the project with the acceptance organization employees. To get the acceptance, the expert team has decided to simulate the batch production and continuous production. They have planned to educate the organization employee to adopt the continuous production instead of batch production by simulating both the conditions in Flexsim.

Batch Production Setup:

In the present batch production, the organization is performing 22 different operations on 11 operating machinery in the different production shop. The flow of materials to the different operative machines in the batch production is given in Figure 1.1. The layout of production shops are given in Figure 1.2. The details of time taken to perform operations on each machine are given in Table 1.1.

Minimum Batch production size is 100.

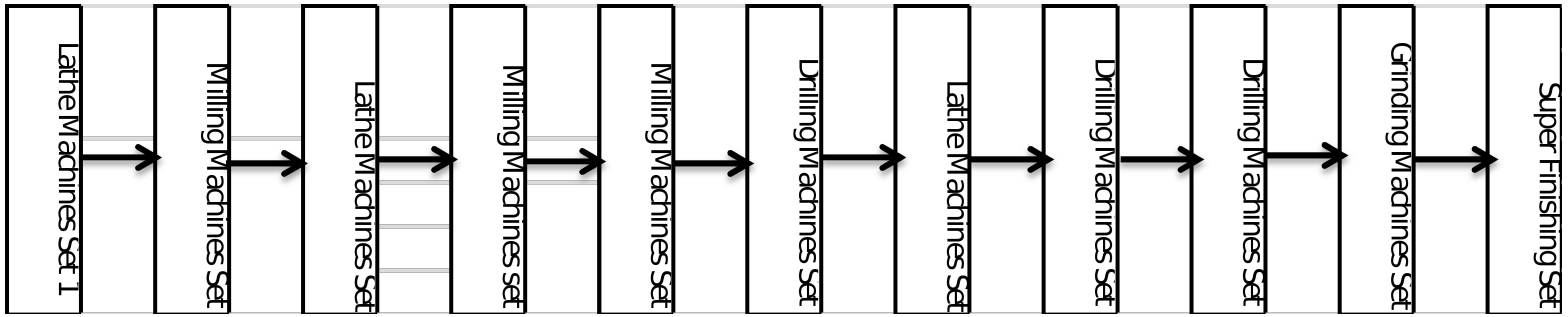

Figure 1.1: The flow of materials to the different operative machines in the batch production

Table 1.1: The details of time taken to perform operations on each set of machines

S.No	Type of Machine	Number of machines	Cycle Time/ Process Time in Second s
1	Lathe Machine Set-1	5	187
2	Lathe Machine Set -2	5	92
3	Lathe Machine Set-3	5	90
4	Milling Machine Set-1	5	90
5	Milling Machine Set-2	5	190
6	Milling Machine Set-3	5	200
7	Drilling Machine Set-1	5	88
8	Drilling Machine Set-2	5	90
9	Drilling Machine Set-3	5	100
10	Grinding Machines Set-1	5	198
11	Superfinishing Set-1	5	210

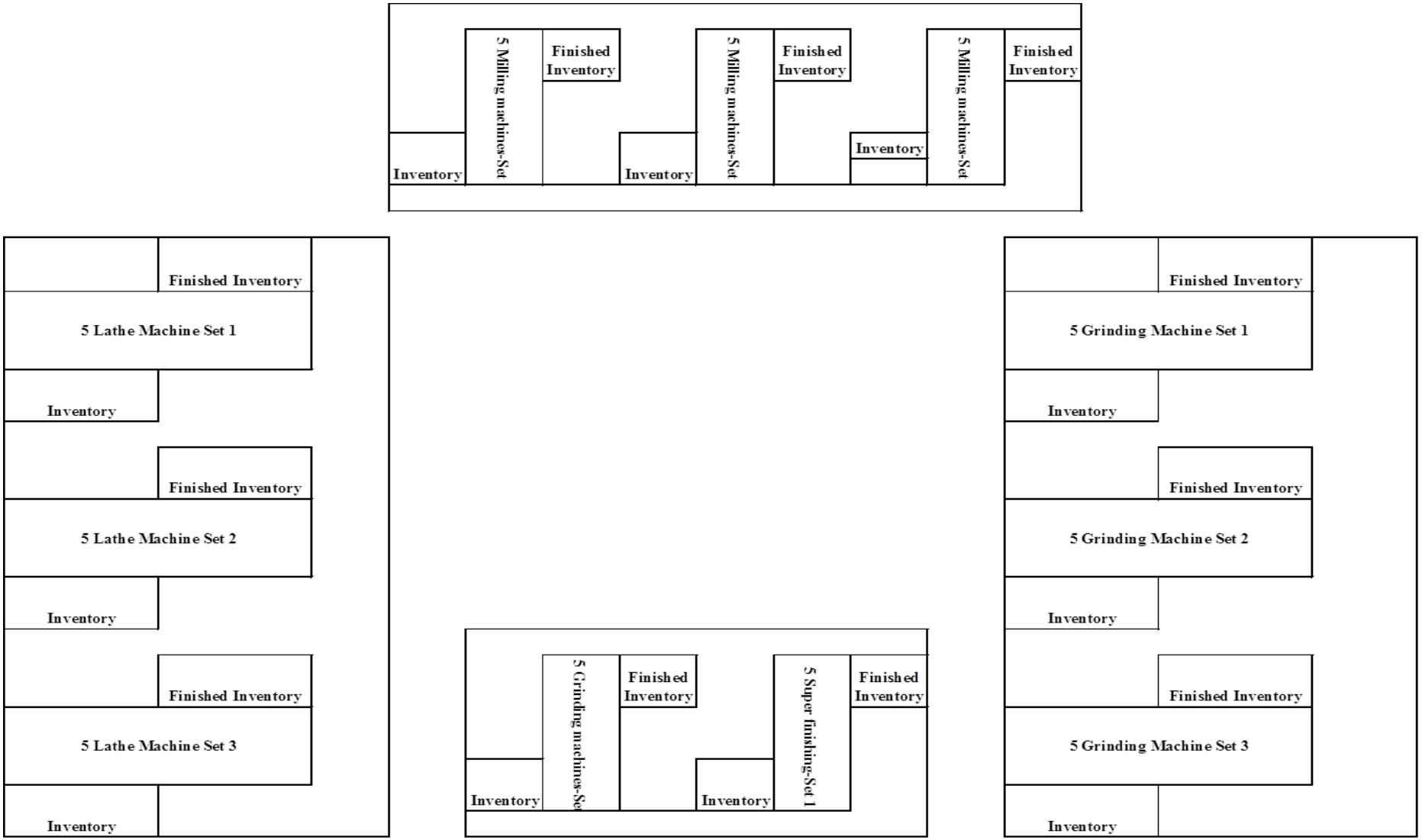

Figure 1.2: The layout of production shops

Continuous Production set up:

In the Continuous production, the organization is performing 22 different operations on 11 operating machinery in the different production shop. However, all machines are arranged as per sequence of operations. This kind of model required to establish five different production lines as per operational sequence on the product. The flow of materials to the different operative machines in the continuous production is given in Figure 1.3. The details of time taken to perform operations on each machine are given in Table 1.2.

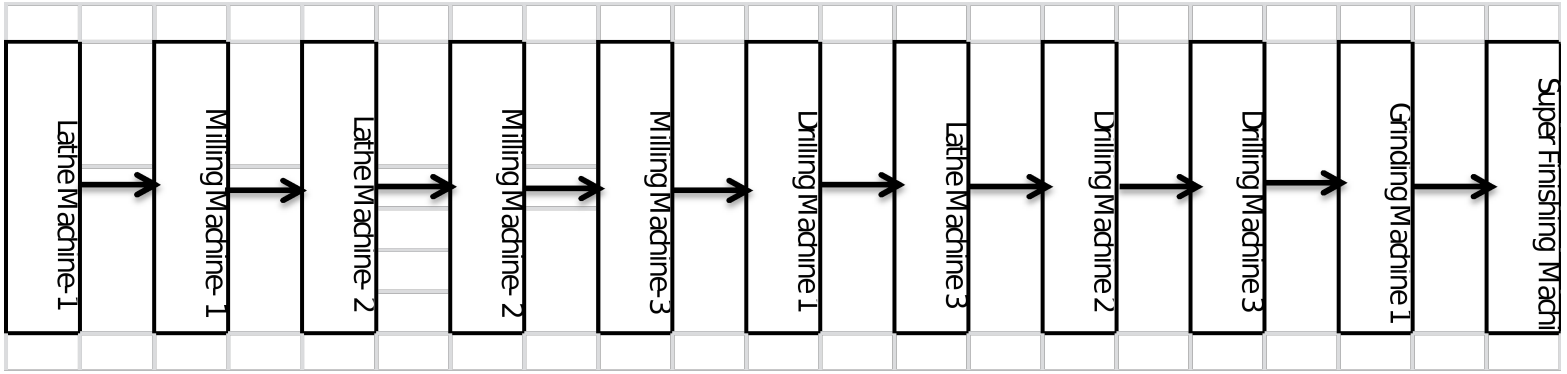

Figure 1.3: The flow of materials to the different operative machines in the continuous production

Table 1.1: The details of time taken to perform operations on each set of machines

S.No	Type of Machine	Number of machines	Cycle Time/ Process Time in Second s
1	Lathe Machine Set-1	5	187
2	Lathe Machine Set -2	5	92
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4	Milling Machine Set-1	5	90
5	Milling Machine Set-2	5	190
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7	Drilling Machine Set-1	5	88
8	Drilling Machine Set-2	5	90
9	Drilling Machine Set-3	5	100
10	Grinding Machines Set-1	5	198
11	Superfinishing Set-1	5	210

Find Out:

1. Production Output Per day.
2. Inventory Level different work stations
3. Time taken to deliver first finished product from super finishing operation in both types of Production.
4. Bar chart for utilization of machines in the aspect of time.
5. Bar chart for each operator utilization.
6. Apply Line Balancing technique to utilize manual resources effectively. How many manual resources is required to perform operations without any production losses in the aspect quantity.