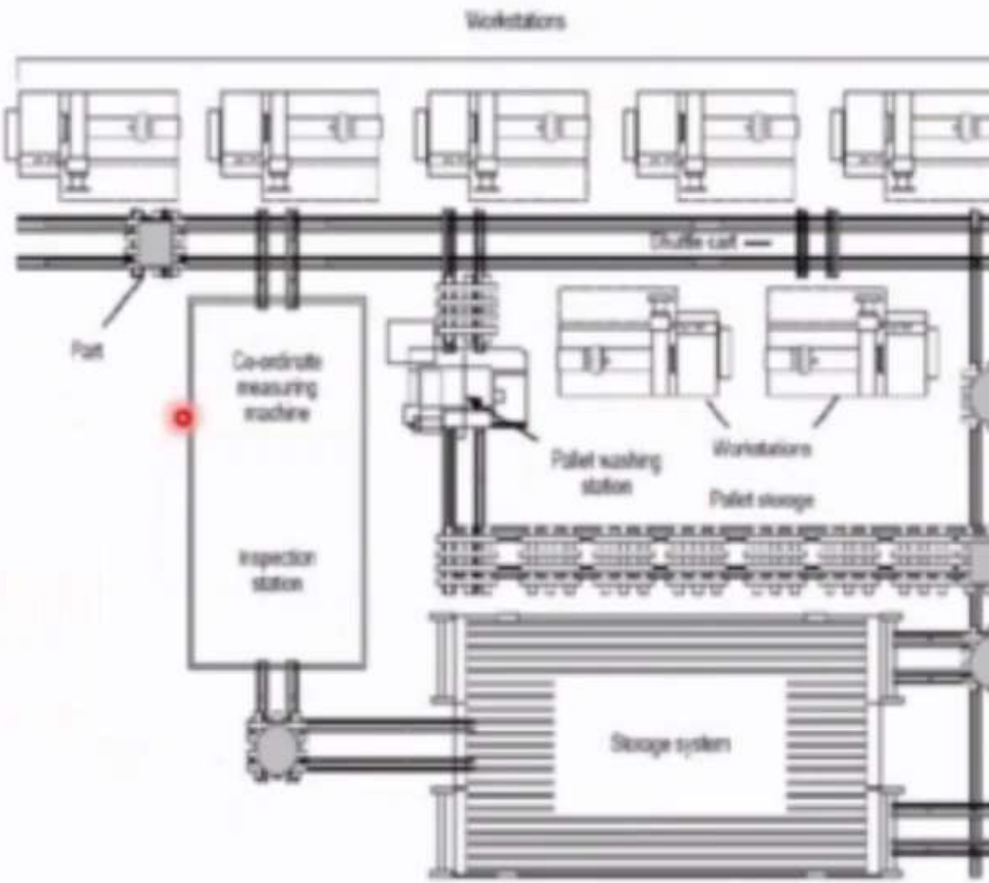
Types of FMS

. Flexible Manufacturing System (FMS)

It consists of four or more processing stations connected mechanically by a common parts handling system and electronically by a distributed computer system.

FMS is larger than the flexible manufacturing cell, not only in the number of workstations it may contain, but also in the number of supporting stations in the system, such as part/pallet washing stations, coordinate measuring machines, storage stations and so on.



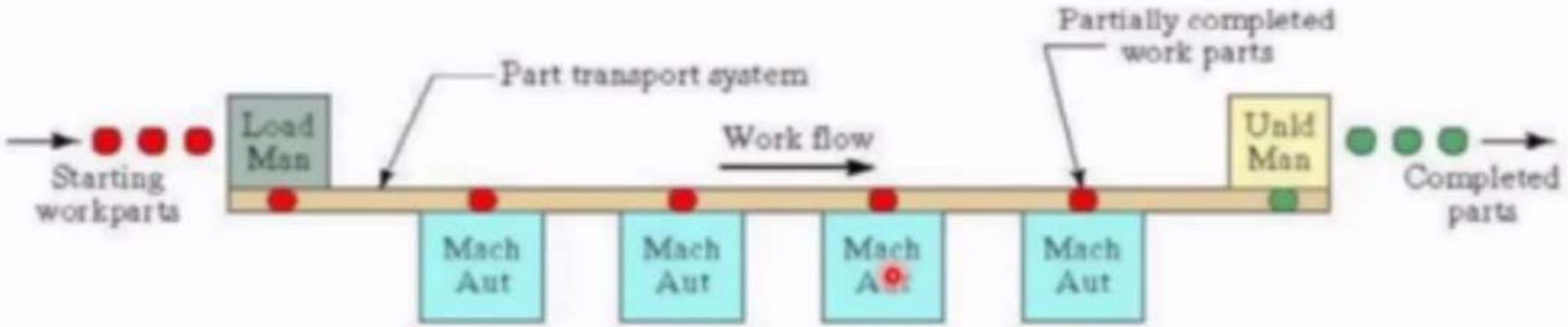
FMS Layout

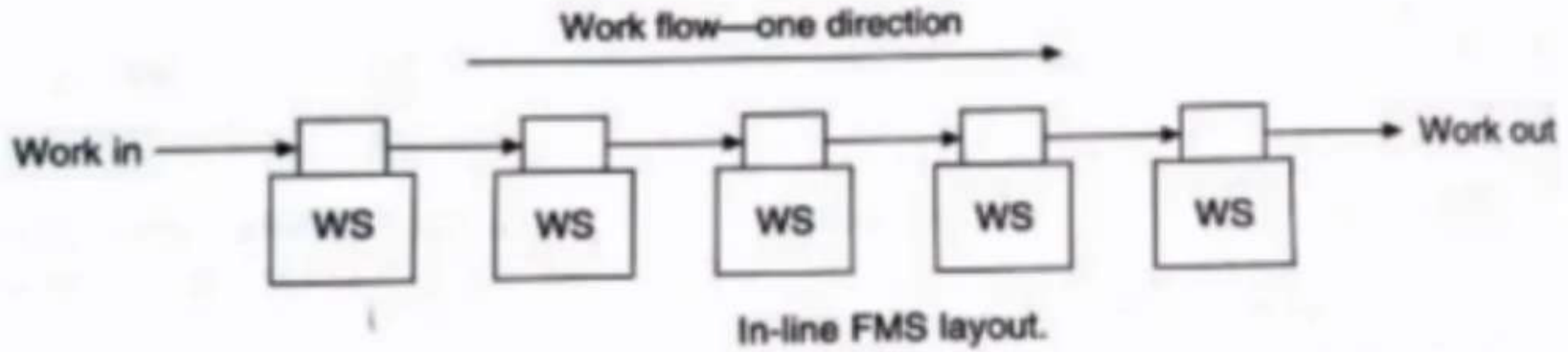
- The FMS layouts are Broadly Classified into the Following categories:

1. FMS line layout
2. FMS loop layout
3. FMS Rectangular layout
4. FMS ladder layout
5. Open field layout
6. Robot – centred cell.

1. In-line or progressive FMS layout

- It is most appropriate for systems in which the work parts progress from one workstation (WS) to the next in a well – defined sequence with no back flow.

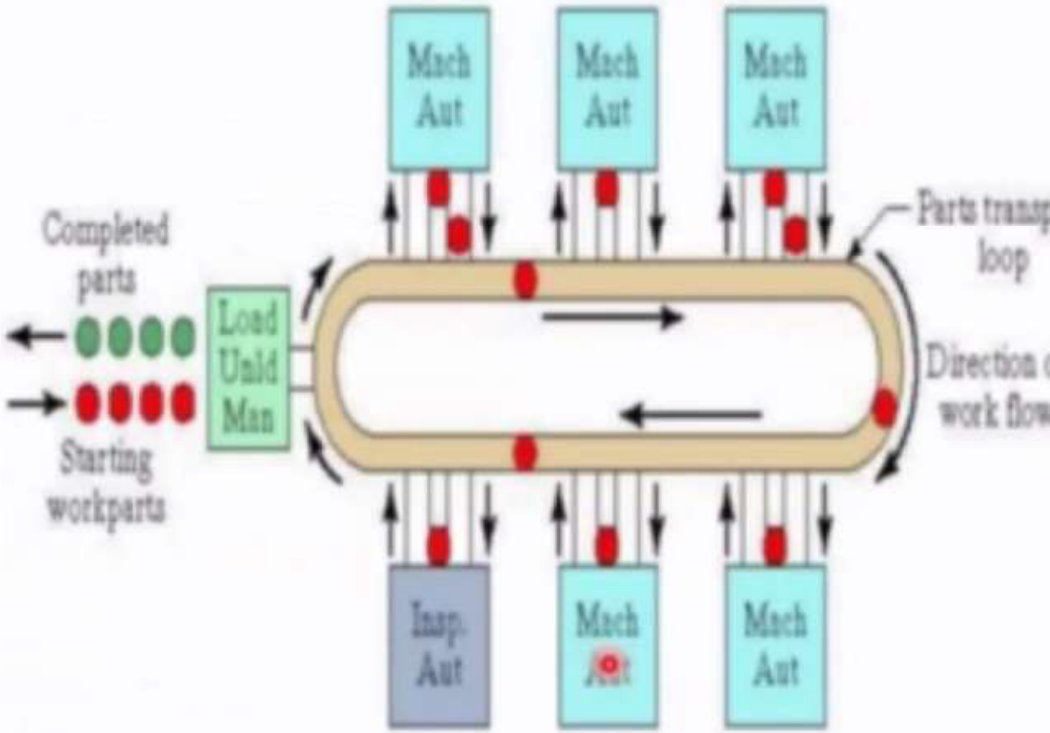


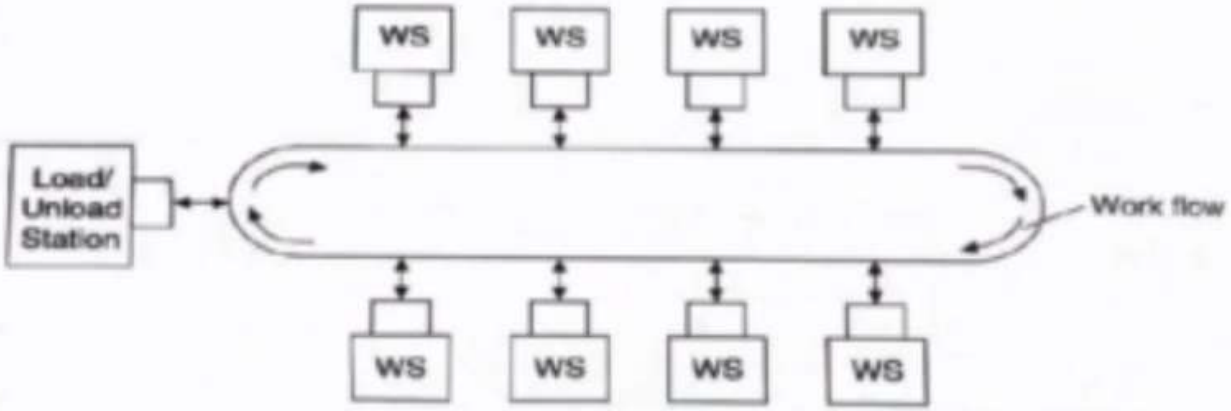


In-line FMS layout.

2. LOOP FMS Layout:

- In this layout work part usually flow in one direction along the loop with the capability at any workstation
- The load/unload stations are located at one end of the loop.

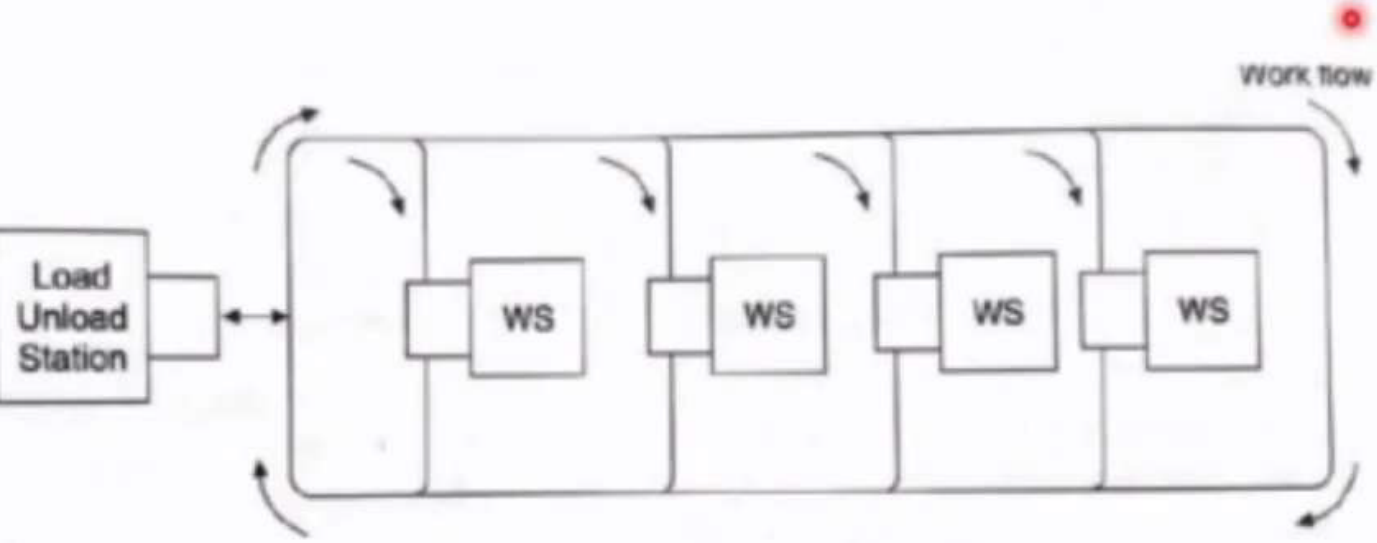




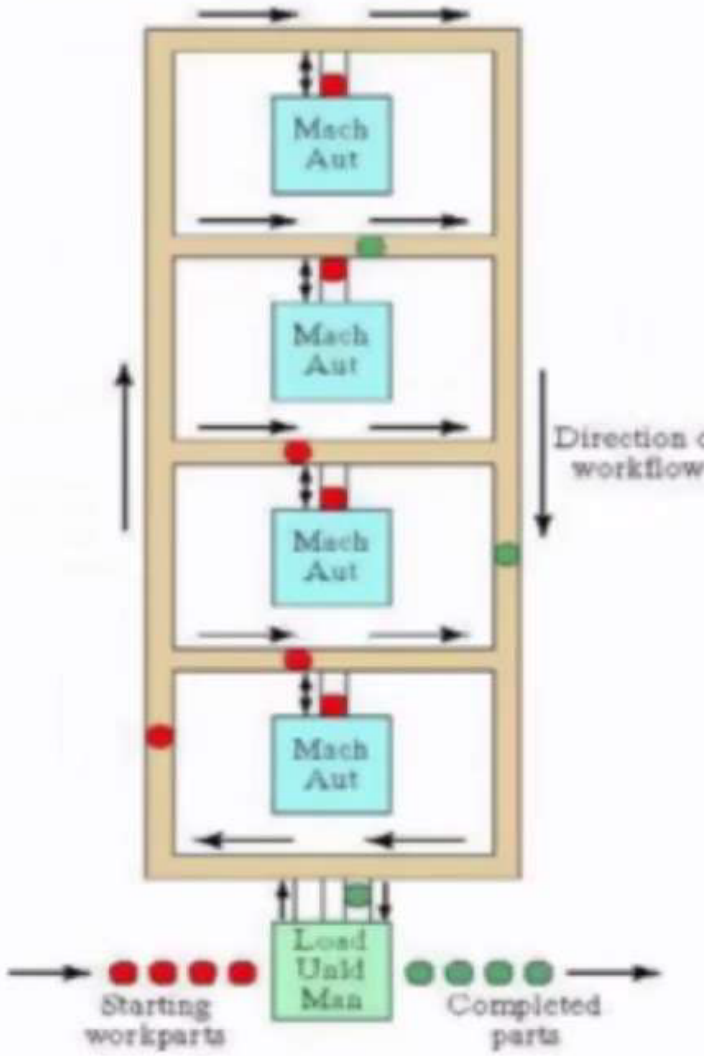
Loop FMS layout.

3. Ladder FMS Layout

- This type of layout contains rungs on which workstations are located.
- This layout reduces the average distance travelled to transfer work parts between stations.

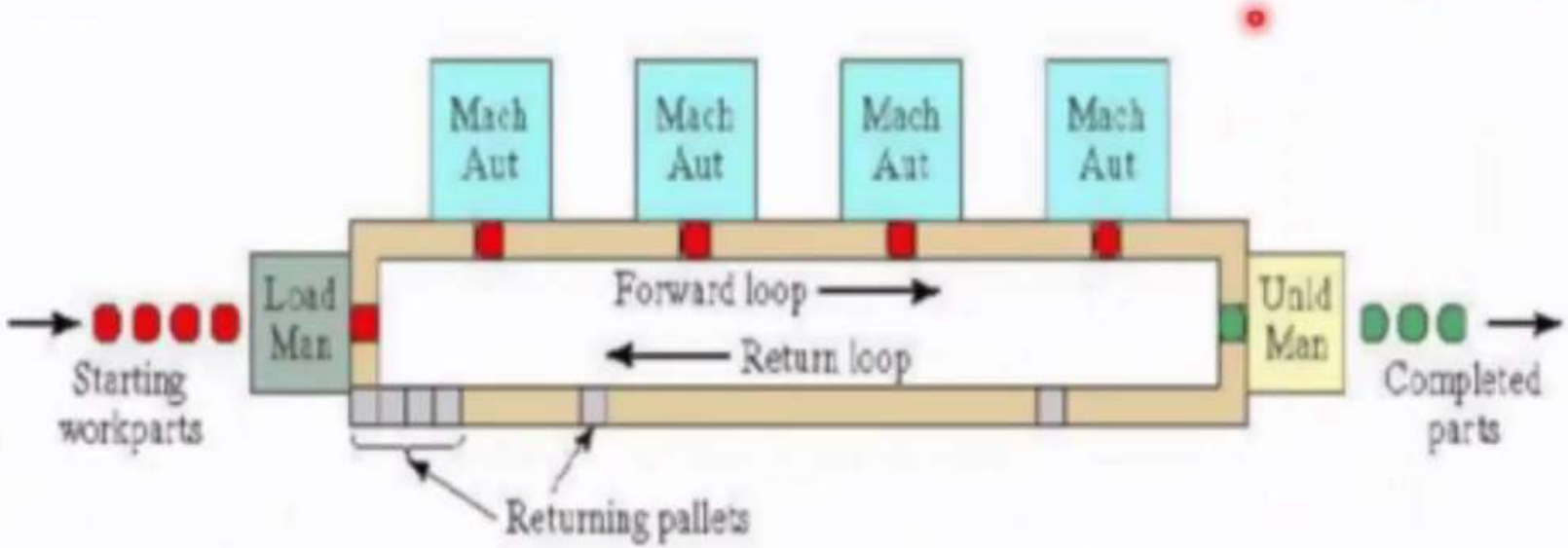


Ladder FMS layout.



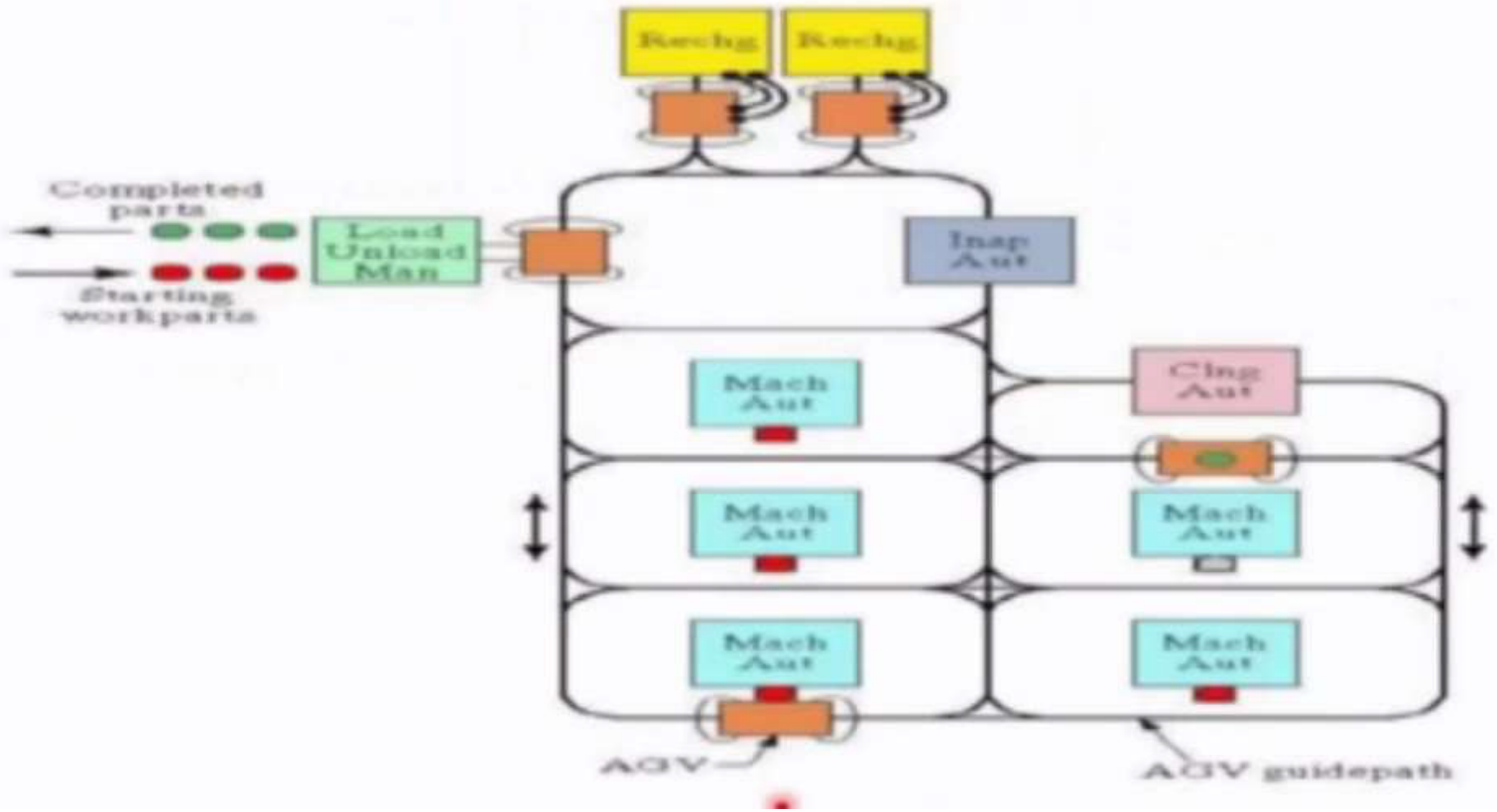
4. Rectangular FMS layout:-

- Rectangular layout allows recirculation of pallets back to the first station in the sequence after unloading at the final station..



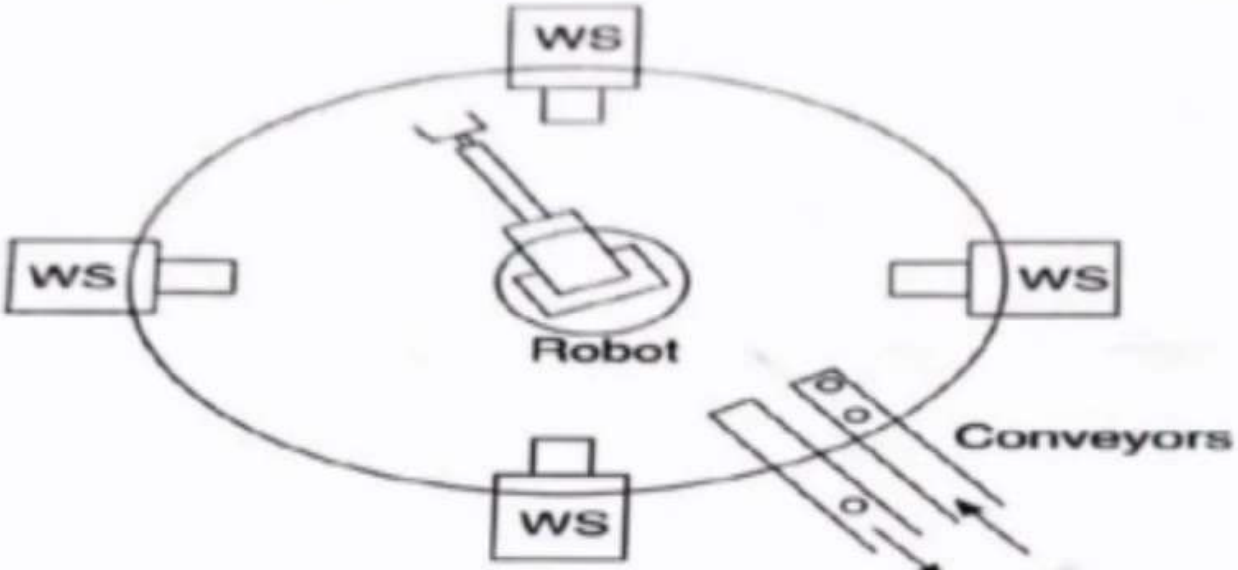
5. Open – field FMS layout

- The open field layout configuration consists of Loops, ladders, and sliding organised t achieve the desired processing requirements
- This is appropriate for a large family of parts.

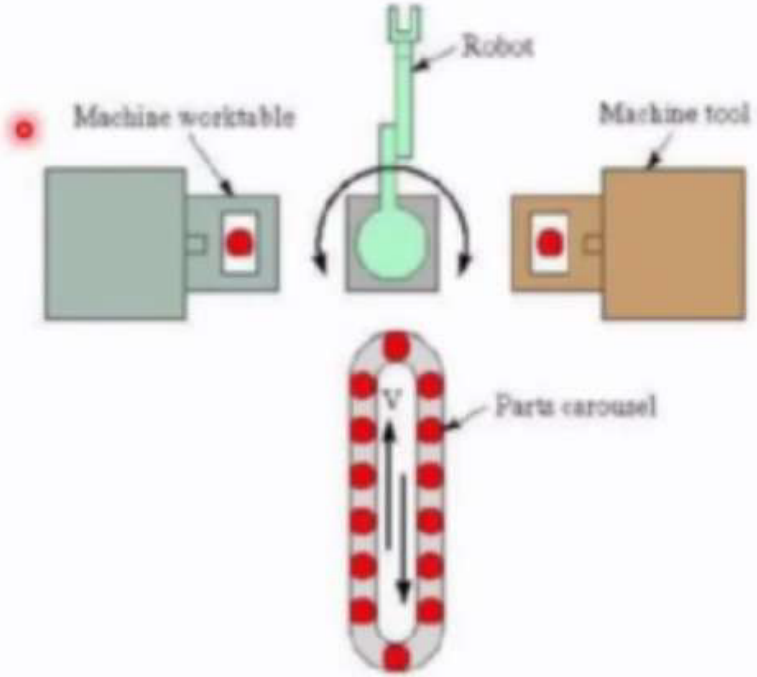


6. Robot – Centred FMS layout

- In this the robot is located at the approximate centre of the layout and the other workstations are arranged around it.
- Industrial robot equipped with grippers may be used for the handling of rotational parts.
- The type of layout is well – suited for handling of cylindrical or disk shaped parts.



Robot-centred FMS layout.



Benefits of FMS

1. Greater flexibility
2. Higher machine utilisation
3. Reduced work-in- progress
4. Lower manufacturing lead times
5. Higher labour productivity (Reduced direct and indirect labour)
6. Better management control
7. Consistent and better quality
8. Reduced inventory

Applications of FMS

- Metal-cutting machining
- Metal forming
- Assembly
- Joining-welding (arc , spot), gluing
- Surface treatment
- Inspection
- Testing