### Automation

Automation is the use of m/c control systems and information technologies to increase/ optimise productivity for the production of the goods and delivery of services.

Automation:

1. Fixed or Hard automation(Ex: sewing m/c, electric iron, fan)
   1. Adjustable automation (Ex: adjust stitch length, pitch of screw of a lathe m/c etc.)
2. Programmable automation after arrival of computers, NC & CNC m/c, CAM & CIM etc.
3. Flexible automation

Robot is a computer control m/c which is coming under the category of Highest level of autonomy/automations.

### Fixed Automation

A manufacturing system in which the sequence of processing (or assembly) operations is fixed by the equipment configuration

Typical features:

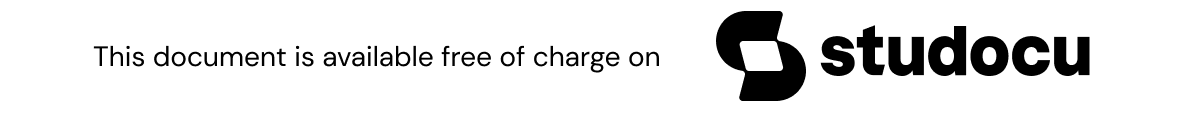
* Suited to high production quantities
* High initial investment for custom-engineered equipment
* High production rates
* Relatively inflexible in accommodating product variety

Programmable Automation

A manufacturing system designed with the capability to change the sequence of operations to accommodate different product configurations

Typical features:

* + High investment in general purpose equipment



* + Lower production rates than fixed automation
  + Flexibility to deal with variations and changes in product configuration
  + Most suitable for batch production
  + Physical setup and part program must be changed between jobs (batches)

## Flexible Automation

An extension of programmable automation in which the system is capable of changing over from one job to the next with no lost time between jobs

Typical features:

* High investment for custom-engineered system
* Continuous production of variable mixes of products
* Medium production rates
* Flexibility to deal with soft product variety