Need of Automation for Clamping

1. **Saves Time**
   Manual clamping and declamping requires 15 to 20 seconds per clamp. For a fixture with multiple clamping points, the total time for clamping will be more than one minute. For uniform clamping, this time will be still more. This time can be saved by automatic clamping. The pay back period for the cost of automation can be estimated considering the net saving per job (Time saved x Machine hour rate).
   Advantage of time saving is increase in production capacity of bottle neck machines.

2. **Reduces operator fatigue**
   In manual clamping, the efficiency of the operator decreases due to fatigue. This may result in less clamping torque at the end of the shift, specifically for the elderly operators, causing reduction in safety. A humane approach is more important than the clamping efficiency. By introducing automatic clamping system, one operator can handle two or more machines simultaneously.

3. **Improves quality of clamping**
   Only one point can be clamped at a time during manual clamping. To achieve uniform clamping, initially all the bolts are clamped with a light clamping force and then with a heavy clamping force. Clamping force at each bolt may vary. However with automation -

   - All clamps can be operated at the same time. There is no need of a light and heavy clamping force.
   - Clamping force can be controlled as per the requirement, to control dimensional accuracy.
   - Clamping force is consistent