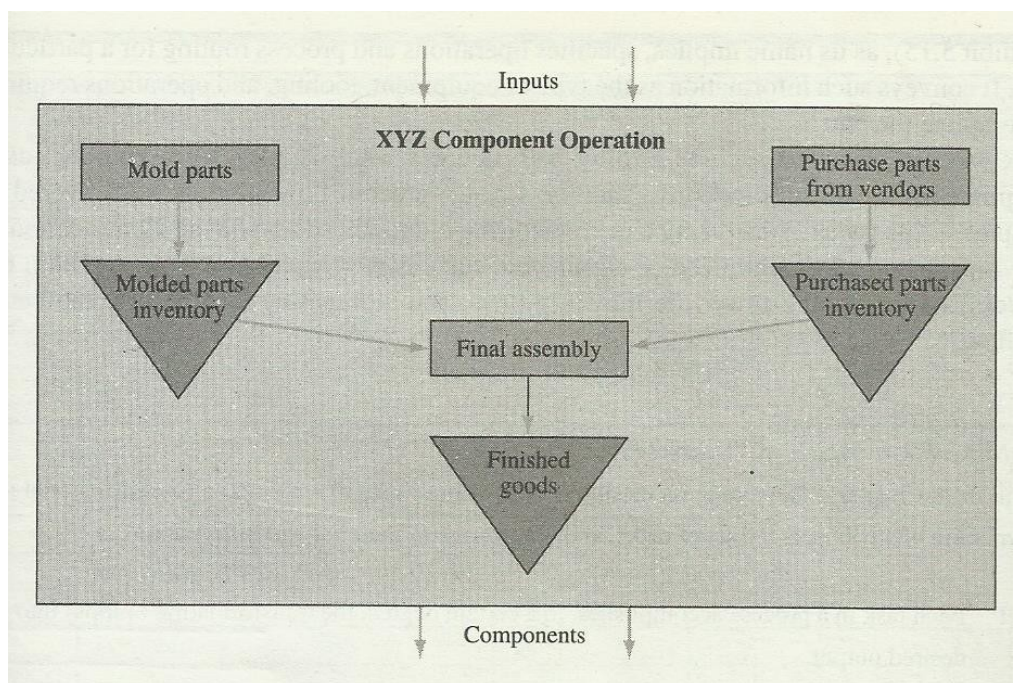


P3. Manufacturing Process Analysis

M/s. XZ Ltd supplies a component to several large auto manufacturers. This component is assembled in a shop by 15 workers working in an eight hour shift for 5 days per week on an assembly line that moves at the rate of 150 components per hour. The workers receive their pay in the form of group incentive amounting to 30 cents per completed good part. This wage is distributed equally among the workers. Management believes that it can hire 15 more workers for a second shift if necessary.

Parts for the final assembly come from two sources. The molding department makes one very critical part and the rest come from outside suppliers. There are 11 machines capable of molding the one part done in-house; but historically, one machine is being overhauled or repaired at any given time. Each machine requires a full-time operator. The machines could each produce 25 parts per hour, and the workers are paid an individual piece-rate of 20 cents per good part. The workers will work overtime at a 50% increase in rate, or for 30 cents for a good part. The workforce for molding is flexible; currently, only six workers are on this job. Four more are available from a labor pool within the company. The raw materials for each part molded cost 10 cents per part. A detailed analysis by the accounting department has concluded that 2 cents of electricity is used in making each part. The parts purchased from outside cost 30 cents for each final component produced.

This entire operation is located in a rented building costing \$100 per week. Supervision, maintenance, and clerical employees cost receive \$1000 per week. The accounting department charges depreciation for equipment against this operation at \$50 per week. The process flow diagram shown below describes the process:



Analyze the process and compute the following:

- (a). Determine the capacity (number of components produced per week) of the entire process.
Are the capacities of all the processes balanced?
- (b). If the molding process were to use 10 machines instead of 6, and no changes were to be made in the final assembly task, what would be the capacity of the entire process?
- (c). If the company went to a second shift of 8 more hours on the assembly task, what would be the new capacity?
- (d). Determine the cost per unit output when the capacity is
 - (i). 6000 per week or
 - (ii). 10000 per week.