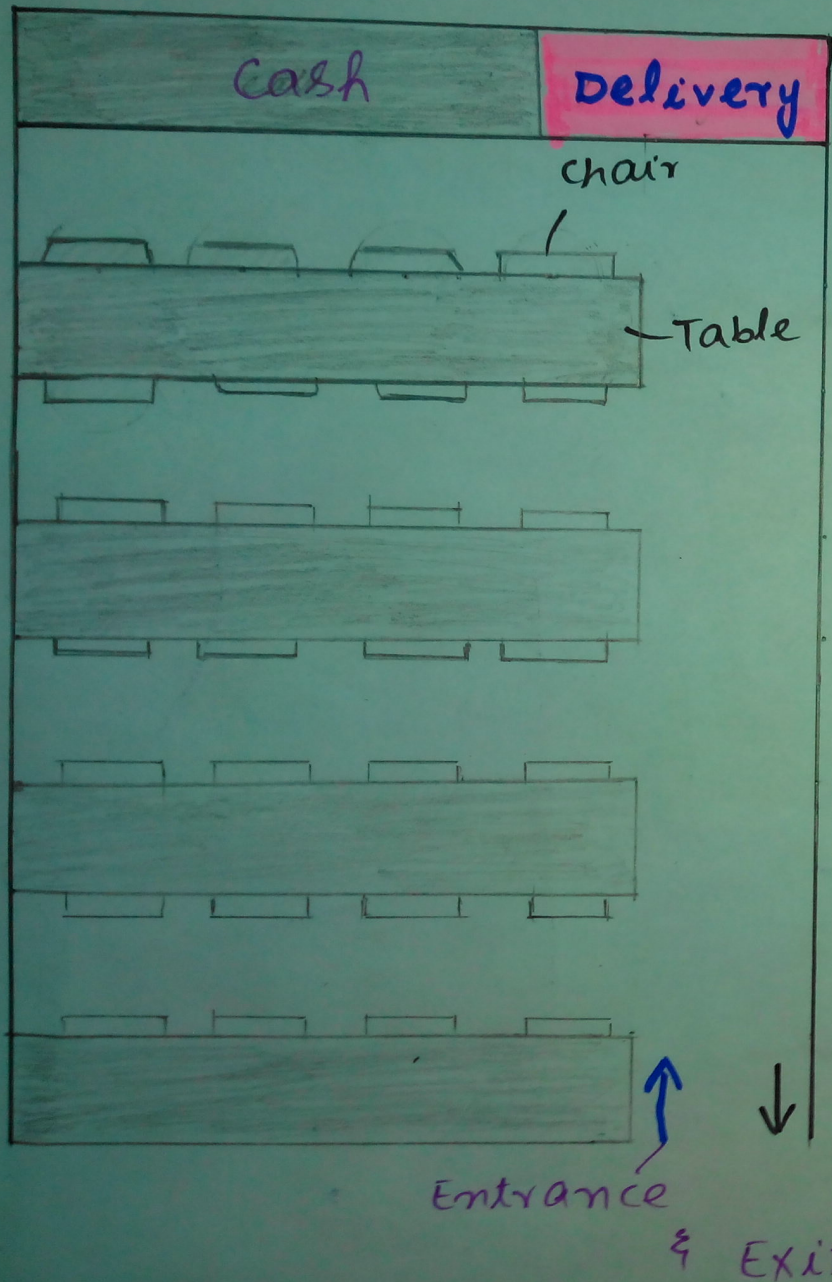
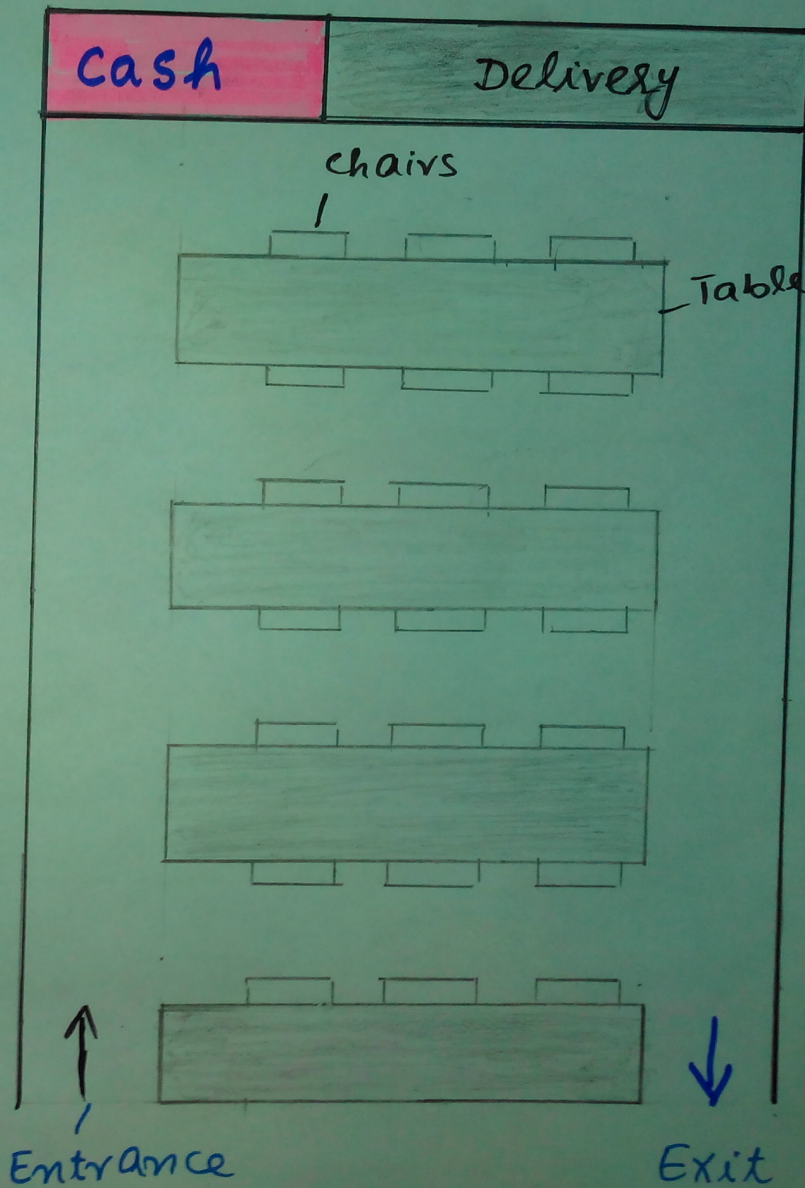


Actual Fast Food Restaurant Lay-out.



Improved Fast Food Restaurant Layout.

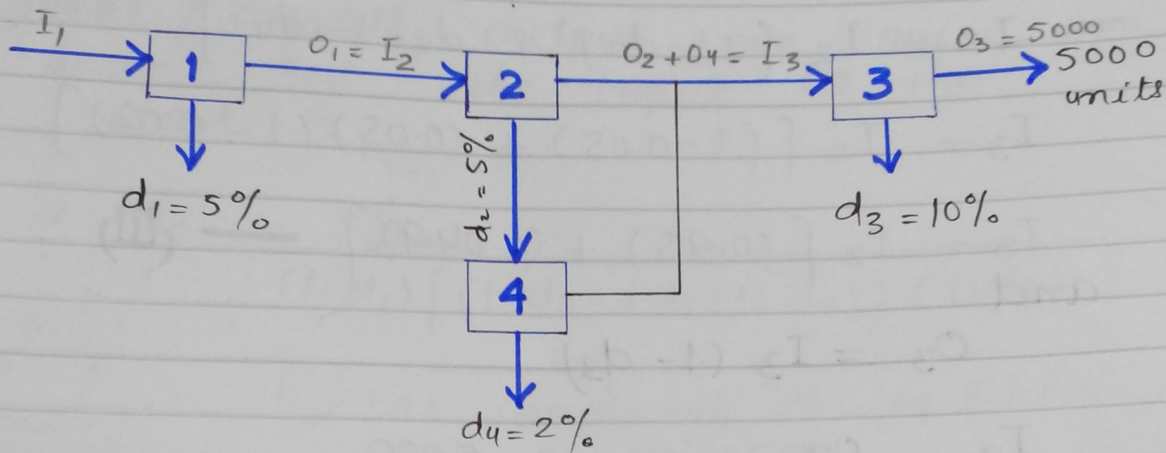


ASSIGNMENT.

Chapter # 02.

2.16.

Given the figure below, operations 4 represents a rework operation -----
----- ?



As we know that

$$O_k = I_k (1 - d_k)$$

For operation 1.

$$O_1 = I_1 (1 - d_1)$$

For operation 2.

$$O_2 = I_2 (1 - d_2) \quad \text{--- (A)}$$

Operation 4 is for the rework. So the input of I_4 is the product of defective part (d_2) of operation 2 into input of operation 2 (I_2)

$$I_4 = I_2 \times d_2 \quad \text{--- (I)}$$

For output of operation 4.

$$O_4 = I_4 (1 - d_4)$$

$$O_4 = I_2 \cdot d_2 (1 - d_4) \quad \text{--- (B)}$$

and

It is clearly shown in the figure that input of operation 3 (I_3) is the combination of the outputs

of operation 2 and operation 4.

$$I_3 = O_2 + O_4 \quad \text{--- (I)}$$

Put eq (A), (B) in eq (I).

$$I_3 = I_2(1-d_2) + I_2 \cdot d_2(1-d_4) \quad \text{--- (C)}$$

$$I_3 = I_2 [(1-d_2) + d_2(1-d_4)]$$

$$I_3 = I_2 [(1-0.05) + (0.05)(1-0.02)]$$

$$I_3 = I_2 [(0.95) + (0.049)] \quad \text{--- (II)}$$

and

$$O_3 = I_3(1-d_3)$$

$$I_3 = \frac{O_3}{(1-d_3)} = \frac{5000}{(1-0.10)}$$

$$I_3 = 5555.55 \text{ units}$$

Put this I_3 value in eq (II)

$$(5555.55) = I_2(0.999)$$

$$I_2 = \frac{5555.55}{0.999}$$

$$I_2 = 5561.1111 \text{ units}$$

$$(I) \Rightarrow I_4 = I_2 \cdot d_2 = 5561.1111 \times 0.05$$

$$I_4 = 278.0555 \text{ units}$$

$$\therefore I_2 = O_1$$

So,

$$O_1 = I_1(1-d_1)$$

$$I_1 = \frac{O_1}{(1-d_1)}$$

$$I_1 = \frac{5561.1111}{1 - 0.05}$$

$$I_1 = 5853.801168 \text{ units}$$

Total / overall output we have given But the Input at the start is;

$$I_1 = \frac{O_{\text{total}}}{(1-d_1) \left[(1-d_2) + d_2(1-d_4) \right] (1-d_3)}$$

As considering the eq (C) i.e rework equation.

$$I_1 = \frac{5000}{(1-0.05) \left[(1-0.05) + 0.05(1-0.02) \right] (1-0.10)}$$

$$I_1 = 5853.801168 \text{ units}$$