

Training Programmes under Centralized and Decentralized Systems

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Abstract

Centralization is the systematic and consistent reservation of authority at central points in the organization. Decentralization is the process of redistributing functions, powers, people or things away from a central location or authority. An organization with N branches is considered, under decentralized system, each branch conducts training programmes separately whenever it needs trainees. But under centralized system, the main office arranges the training programmes to get the waiting list of trainees for all the branches together, In this paper the problem of determining which system will be cost wise suitable to conduct training programmes, is discussed .Numerical Example is also given.

Keywords: Centralization, Decentralization, Training Programmes, The total annual Cost for training.

1. Introduction

Training Programs are targeted at improving knowledge, skills and attitude to work so as to remove deficiency in job performance and improve behaviour at work in general Also training can be described as any learning activity which is directed towards the acquisition of specific knowledge and skills for the purpose of an occupation, At the same time the aim of human resource management is to have people at the lowest possible costs, given the objective to ensure smooth functioning of the organization. Thus training programming is to be arranged so that sufficient number of trainees is got at the lowest possible cost.

There are two types of systems available for an organization to follow. They are centralized system and decentralized system. Centralization is the systematic and consistent reservation of authority at central points in the organization, But in a decentralized concern authority is retained by the top management for taking major decisions and framing policies concerning the whole organization and rest of the authority may be delegated to various branches. So each branch makes local autonomous decision towards its individual goals.

In this paper, the policy of the organization to conduct training programmes under centralized and decentralized systems is discussed. Accordingly if the organization decides to follow decentralized system, each branch of the organization can conduct training programmes separately whenever there is need. But under centralized system, the main office arranges the training programme and gets the required waiting list of trainees for all the branches together.

The problem to be addressed here is to determine, from cost-factor point of view, which system is better.

2. The Basic Concepts

Consider an organization which has N branches. Each branch faces the situation of vacancy arising. The vacancies are filled with recruits who have already completed training programmes and are placed in waiting list.

After completing training, the trainees are placed in waiting list and given a stipend amount till they got posting. The game of trainees' management aims at attaining a healthy balance between the cost of having the required number of trainees and cost of not having it.

The optimum solution is to find out when to conduct a training programme and what should be the batch size. Thus the optimal training policy lies in reducing the no of trainees in the waiting list and at the same time ensuring smooth functioning of the organization.

First the problem is discussed for decentralized system.

3. Methodology

An organisation with N branches is considered. The sum of the cost of conducting a training programme and stipend amount paid to the trainees is calculated for each branch when this cost is minimum the optimum batch size is determined using differential calculus and also by logical inference. Then the total cost for conducting training programmes for all the branches together is calculated. This is for decentralized system.

Similarly under centralized system the total cost is determined when the main office alone conducts the training programme to get trainees for the branches. Finally the two systems are compared with the help of numerical examples with hypothetical data and it is proved that centralized system is better than the other system.

4. The Decentralized System

Let

N - No. of branches

K_i – Cost of conducting training programme by branch i.

S_i - Stipend amount per trainee being in the waiting list of branch i.

V_i - number of vacancies arising in branch i during a given period.

M_i – No of trainees for each batch of the training programme.

Then

Annual Cost of conducting a training programme for branch i

$$= \frac{\text{Annual number of vacancies}}{\text{Number of trainees for each batch}} \times \text{Cost of conducting one training program}$$

$$= \frac{V_i}{M_i} \times K_i \quad \text{-----} \quad (1)$$

Annual

Expenditure on Stipend

$$= \text{Average number of trainees in the waiting list} \times \text{Stipend per trainee}$$

$$= \frac{M_i}{2} \times S_i \quad \text{-----} \quad (2)$$

$$TC_i = \frac{V_i K_i}{M_i} + \frac{M_i}{2 S_i} \quad \text{Then} \quad \frac{d(TC_i)}{dM_i} = -\frac{V_i K_i}{M_i^2} + \frac{S_i}{2}$$

$$\frac{d(TC_i)}{dM_i} = 0 \Rightarrow M_i^2 = \frac{2V_i K_i}{S_i}$$

$$\text{Also} \quad \frac{d^2(TC_i)}{dM_i^2} > 0$$

$$\text{Thus } d(TC_i) \text{ is minimum when } M_i^2 = \frac{2V_i K_i}{S_i}$$

It can also be proved as follows.

It is clear that the optimum batch size is taken as that value at which the training cost is equal to the stipend amount and for that value total cost is minimum.

We have

$$\frac{V_i}{M_i} \times K_i = \frac{M_i}{2} \times S_i$$

(i.e) $M_i^2 = \frac{2 V_i K_i}{S_i}$

Thus the optimum batch size for branch i when its total cost is minimum

$$M_i^* = \sqrt{\frac{2 V_i K_i}{S_i}} \quad \text{----- (3)}$$

Also the total annual cost for the trainees

= Sum of annual cost for conducting training programme and annual expenditure on stipend

Hence minimum total cost = TC (1)

$$\begin{aligned} &= \sum_{i=1}^N TC_i \\ &= \sum_{i=1}^N \left[\frac{V_i}{M_i^*} \times K_i + \frac{M_i^*}{2} \times S_i \right] \\ &= \sum_{i=1}^N \sqrt{2 V_i K_i C_i} \quad \text{from (3)} \end{aligned}$$

Also branch i can conduct a training programme with M_i^* persons at a time interval

$t_i^* = \sqrt{\frac{2 K_i}{V_i S_i}}$ between two programmes, as

$t_i^* = \frac{M_i^*}{V_i} \quad \text{----- (4)}$

Next centralized system can be considered.

5. Centralized System

Under this system instead of the branches arranging training programmes to get the waiting list of the trainees for filling up the vacancies in their respective branches the main office arranges the training programme. So V, the no. of vacancies considered by the main office, will be the sum of the no. of vacancies in all the branches together.

i.e $V = \sum_{i=1}^N V_i \quad \text{----- (5)}$

Let

K – Cost of conducting one training programme by the main office

C – Stipend paid to a trainee in the waiting list maintained by the main office

Then the minimum total cost is calculated as in the case of decentralized system to be

$$TC (2) = \sqrt{2VKC} \quad \text{-----} (6)$$

6. Comparison of the two Systems

Case (i)

Let $K_1 = K_2 = \dots\dots\dots = K_N = K$

$C_1 = C_2 = \dots\dots\dots = C_N = C$

We have $\sum \sqrt{V_i} \geq \sqrt{\sum V_i}$

TC (1)

$$\begin{aligned} \sum_i \sqrt{2 V_i K C} &\geq \sqrt{\sum_i 2 V_i K C} \\ &= \sqrt{2 K C \sum V_i} \\ &= \sqrt{2 V K C} \end{aligned}$$

Therefore $TC (1) \geq TC(2)$

Thus the decentralized system is not less expensive than the centralized system when the cost of conducting a training programme and the stipend amount is the same for the main office and all the branches.

Case (II)

Even When K_i 's and C_i 's are different, the same result given above can be shown to be true by actual calculation .i.e. by numerical examples

7. Numerical Example

Case (i)

Let N= 5

$$\square_1 = \square_2 = \square_3 = \square_4 = \square_5 = K = 2000$$

$$\square_1 = \square_2 = \square_3 = \square_4 = \square_5 = 1000$$

$$\square_1 = 50, \square_2 = 80, \square_3 = 75, \square_4 = 70, \square_5 = 65$$

$$\begin{aligned} TC (1) &= 14,142.14 + 17,888.54 + 17,320.51 + 16,733.20 + 16,733.20 \\ &= 82,208.91 \end{aligned}$$

$$\text{Let } V = \sum \square_{\square} = 340, K = 2000$$

$$TC (2) = \sqrt{2 \square \square \square} = 36,878.18$$

Thus $TC (1) > TC (2)$

Case (ii)

(a) Let $\square_1, \dots\dots\dots \square_5 \leq \square$

$\square_1, \square_2, \dots\dots\dots \square_5 \leq C$

Q_1	Q_2	Q_3	Cost
2000	1000	50	14,424.14
2200	1200	80	20,552.37
1800	1000	75	16,431.68
2100	1100	70	17,983.33
1900	1200	65	17,216.27
			86,325.79

Thus TC (2) = 63,874.88

(b) Let $Q_1, Q_2, \dots, Q_5 \geq K$

Q_1	Q_2	Q_3	Cost
3200	1000	50	17,888.54
3250	1200	80	24,979.99
3300	1000	75	22,248.60
3100	1100	70	21,849.49
3100	1200	65	21,633.31
			1,08599.93

Here TC (1) = 1, 08,599.93 while

TC (2) = 63,874.88

Here also TC (1) > TC (2)

Thus for any set of values K's and C's, we see that the centralized is better than decentralized system.

8. Conclusion

Generally decentralization is said to increase efficiency and effectiveness due to reduction of congestion in communications improved ability to deliver services etc. But in framing the policy regarding training programme it is seen that centralization is better while the cost factor is concerned.

References

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