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A Study on Facility Location of KFC in Mysore City

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Abstract

The study is to know about facility location of KFC in Mysore city and to understand the facilities provided to the customers through its layout specifications, and to suggest the organization a suitable location where they can get more customers, Facility location and facility layout analysis is the very initial part of locating new or relocating existing outlets of an organization. Such as KFC (Kentucky Fried Chicken) is the third largest fast food chain with over 12,200 outlets in 99 countries Lay outing is carried with the help of various operation management concepts which increases the depth of facility location and also provides a scope for generalization.

Keywords: *Facility location, layout specification, Factor rating method, Profit volume ratio.*

I. Introduction

Facility location, also known as location analysis or k centre problem, is a branch of operations research and computational geometry concerning itself with mathematical modeling and solution of problems concerning optimal placement of facilities in order to minimize transportation costs, avoid placing hazardous materials near housing, outperform competitors' facilities, etc. Although originated from location problems, the study also applies to data clustering, which in turn is related to unsupervised learning, classification, databases, spatial range-searching, data-mining etc.

Minimum Facility Location

A simple facility location problem is the fermat-weber problem, in which a single facility is to be placed, with the only optimization criterion being the minimization of the weighted sum of distances from a given set of point sites. More complex problems considered in this discipline include the placement of multiple facilities, constraints on the locations of facilities, and more complex optimization criteria. In a basic formulation, the facility location problem consists of a set of potential facility sites l where a facility can be opened, and a set of demand points d that must be serviced. The goal is to pick a subset f of facilities to open, to minimize the sum of distances from each demand point to its nearest facility, plus the sum of opening costs of the facilities. The facility location problem on general graphs is np-hard to solve optimally, by reduction from (for example) the set cover problem. A number of approximation algorithms have been developed for the facility location (fp) problem and many of its variants .without assumptions on the set of distances between clients and sites (in particular, without assuming that the distances satisfy the triangle inequality), the problem is known as non-metric facility location and is approximable within a factor o(log(n)). This factor is tight, via an approximation-preserving reduction from the set cover problem. If we assume distances between clients and sites are undirected and satisfy the triangle inequality, we are talking about a metric facility location problem (mfl). The mfl is still np-hard and hard to approximate within factor better than 1.46. The currently best known approximation algorithm achieves approximation ratio of 1.488.

Factors in Determining Layout and Design

Small business owners need to consider many operational factors when building or renovating a facility for maximum layout effectiveness. These criteria include the following:

Ease of future expansion or change: Facilities should be designed so that they can be easily expanded or adjusted to meet changing production needs. "Although redesigning a facility is a major, expensive undertaking not to be done lightly, there is always the possibility that a redesign will be necessary," said Weiss and Gershon in their book Production and Operations Management. "Therefore, any design should be flexible'. Flexible manufacturing systems most often are highly automated facilities having intermediate-volume production of a variety of products. Their goal is to minimize changeover or setup times for producing the different products while still achieving close to assembly line (single-product) production rates."

Flow of movement: The facility design should reflect a recognition of the importance of smooth process flow. In the case of factory facilities, the editors of How to Run a Small Business state that "ideally, the plan will show the raw materials entering your plant at one end and the finished product emerging at the other. The flow need not be a straight line. Parallel flows, U-shaped patterns, or even a zig-zag that ends up with the finished product back at the shipping and receiving bays can be functional. However, backtracking is to be avoided in whatever pattern is chosen. When parts and materials move against or across the overall flow, personnel and paperwork become confused, parts become lost, and the attainment of coordination becomes complicated."

Materials handling: Small business owners should make certain that the facility layout makes it possible to handle materials (products, equipment, containers, etc.) in an orderly, efficient and preferably simple manner.

Output needs: The facility should be laid out in a way that is conducive to helping the business meet its production needs.

Space utilization: This aspect of facility design includes everything from making sure that traffic lanes are wide enough to making certain that inventory storage warehouses or rooms utilize as much vertical space as possible.

Shipping and receiving: The J. K. Lasser Institute counseled small business owners to leave ample room for this aspect of operations. "While space does tend to fill itself up, receiving and shipping rarely get enough space for the work to be done effectively," it said in How to Run a Small Business.

Ease of communication and support: Facilities should be laid out so that communication within various areas of the business and interactions with vendors and customers can be done in an easy and effective manner. Similarly, support areas should be stationed in areas that help them to serve operating areas.

Impact on employee morale and job satisfaction: Since countless studies have indicated that employee morale has a major impact on productivity, Weiss and Gershon counsel owners and managers to heed this factor when pondering facility design alternatives: "Some ways layout design can increase morale are obvious, such as providing for light-colored walls, windows, space. Other ways are less obvious and not directly related to the production process. Some examples are including a cafeteria or even a gymnasium in the facility design. Again, though, there are costs to be traded off. That is, does the increase in morale due to a cafeteria increase productivity to the extent that the increased productivity covers the cost of building and staffing the cafeteria."

Promotional value: If the business commonly receives visitors in the form of customers, vendors, investors, etc., the small business owner may want to make sure that the facility layout is an attractive one that further burnishes the company's reputation. Design factors that can influence the degree of attractiveness of a facility include not only the design of the production area itself, but the impact that it has on, for instance, ease of fulfilling maintenance/cleaning tasks.

Safety: The facility layout should enable the business to effectively operate in accordance with Occupational Safety and Health Administration guidelines and other legal restrictions.

II. Analysis and Interpretation

Method of Factor Rating:

In factor rating method, first we must identify the Most Important Factors in evaluating alternative sites for the new facility. Then we should assign a weight between 0 and 100 to each of these factors. Each alternative location will then be rated based on these factor weights. The most weighted alternative is selected as the best alternative.

Suppose KFC is considering three alternative sites for its new facility locations.

Site A: Urs Road

Site B: Kalidasa Road

Site C: Vijaynagar

After evaluating the firm's Needs, the Managers have narrowed the list of Important Selection Criteria down into three major Factors: Availability of skilled labor, Availability of suitable Infrastructure and Proximity of target customers.

Weights reflecting the relative importance of each factor have been assigned as follows:

Sl No.	Factors	Weights
1	Availability of Skilled labor	0.50
2	Availability of Raw materials	0.30
3	Proximity to the firms market	0.20
	Total	1.00

Based on these criteria, the three Alternative sites were scored between 0 and 100 points:

Sl No.	Factors	Site scores		
		Site A	Site B	Site C
1	Availability of Skilled labor	70	70	50
2	Availability of Raw materials	60	40	90
3	Proximity to the firms market	70	95	60

Now we will multiply each score by its corresponding factor weight:

Weighted scores are calculated as: (Site Score) x (Factor Weight)

Sl No.	Factors	Site A		Site B		Site C	
		Score	weighted	Score	Weighted	Score	weighted
1	Availability of Skilled labor	70	35	70	35	50	25
2	Availability of Raw materials	60	18	40	12	90	27
3	Proximity to the firms market	70	14	95	19	60	12
	Total Weighted scores		67		66		64

From these results, the largest total weight is for Site A. It appears to be the best location.

What happens if we change the factor weights? Let's use the following factor weights:

Skilled labor: 0.45;
Raw Materials: 0.40;
Market: 0.15.
Then the following results are obtained:

Sl No.	Factors	Site A		Site B		Site C	
		Score	weighted	Score	weighted	Score	weighted
1	Availability of Skilled labor	70	31.5	70	31.5	50	22.5
2	Availability of Raw materials	60	24	40	16	90	36
3	Proximity to the firms market	70	10.5	95	14.25	60	9
	Total Weighted Scores		66		61.75		67.5

In this case, Site "C" appears to be the best choice with largest weight score.

Therefore, factor rating method is very sensitive to the weights assigned to each factor.

Since factor weights, selected factors, and assigned scores are all determined subjectively, the managers should be very careful in selecting these items and numbers.

Cost profit volume analysis:

When the fixed and variable costs for each site differ, Cost-profit-volume analysis can be used to identify the location with the lowest cost.

Example

Suppose KFC is considering three alternative sites for its new production facility.

Site A: Urs Road

Site B: Kalidasa Road

Site C: Vijaynagar

The Annual Production Cost associated with each alternative is a linear function of the production volume. i.e;

Total Production Cost = (Fixed Cost) + (variable unit cost) x (annual production volume)

Assume that the expected annual production volume is 250.000 units. And further assume that: (x: production volume = 250.000)

For Site A: Prod. Cost = 10.000.000 + 250 x

For Site B: Prod. Cost = 25.000.000 + 150 x

For Site C: Prod. Cost = 60.000.000 + 50 x

Based on this information, which site has the lowest cost?

At a production volume of 250.000 units, site B has the lowest cost, because
For Site A: Prod. Cost = 10.000.000 + 250 (250.000) = 72.500.000

For Site B: Prod. Cost = 25.000.000 + 150 (250.000) = 62.500.000

For Site C: Prod. Cost = 60.000.000 + 50 (250.000) = 72.500.000

III. Findings and Suggestions

Great works are performed not by strength but by persistence. Facility location and facility layout analysis is the very initial part of locating new or relocating existing outlets of an organization. Therefore the best suitable area would be C i.e; Vijaynagar as both the methods suggests that its worth of investing. All the facility locations and layouts selected by the KFC are the state of the art KFC because they used the proper methods for facility location and layout analysis of new or existing outlets. Lot of other locations around the world is waiting for KFC title.

IV. Conclusions

KFC can progress rapidly by identifying new facility locations and increasing existing target market and facility locations by launching new competitive product chain at minimum cost. KFC's Unity Drive had a simple but essential message and objective. To bring together the people by promoting in the words of KFC founder, "Unity, Faith & Discipline". In a time of uncertainty and fear, KFC rose to the occasion and built a platform of solidarity and togetherness for the people. The campaign proved to be a successful initiative is not just providing hope for our patrons, but also allowed KFC to take an effective step forward during tough times and entrust other responsive companies to act in a similar manner.

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