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Capacity management lies at the core of every successful operational strategy whether service or manufacturing. It is part of a larger corporate strategy which is a long term plan to achieve a certain target (Jones and Kutsch, 2007). It is imperative for every organization to know how well its capacity is being utilized as its long term success is based on it (Krajewski and Ritzman, 2002). Capacity measurement helps determine the overall operational costs and forms the basis of important decisions like expansion (Yu Lee, 2002). This paper will endeavour to resolve the capacity management issues of a health facility called Fitness Plus in Greensboro, North Carolina.

Fitness Plus began its operations in a large suburban park in Greensboro, North Carolina in 1991. Under health and sports it provides fitness, relaxation and recreational facilities operating 7 days a week (For details see Appendix 1). Customers use the facilities having subscribed to yearly memberships. Lately the area of Greensboro has expanded in population and businesses. Growth in population increased health awareness in residents and has increased demand for fitness facilities. Other health centres have also opened namely YMCA, Oasis and Golds Gym. YMCA offers full range of facilities, Golds Gym has only cardiovascular and weight training and Oasis is restricted to only adults over 16 years of age.

Available data indicates that by May 2002 members visiting Fitness Plus every hour during peak time (4 – 7pm) had doubled to 80 from 1997. The average visits per hour increased from 15 to 25 in a typical day resultantly the facility got overcrowded and complaints arose about non-availability of equipment. Most number of complaints arise in the specific areas of

aerobics, nautilus and cardiovascular. The capacity of Fitness Plus needs to be measured and planned properly in order to form an effective operational strategy both in the long and short terms. There are two options available i. e. first is to effectively manage the existing facility which will take few months and second is to build a new facility in the downtown area which might take upto a year to become operational. Due to financial and time constraints a short term solution is needed for now and a long term later.

In the following report the capacity issues of Fitness Plus will be discussed in three sections A, B and C. In section “ A” the capacity of Fitness Plus will be measured and analysed to see whether there is sufficient capacity to deal with the immediate issues of overcrowding and non-availability of equipment. Section “ B” will ascertain which capacity strategy would be appropriate for Fitness Plus with the necessary justifications. In section “ C” the adopted strategy would be described in detail and linked with other types of operating decisions i. e. finance, HR, marketing and supply chain. Lastly in the conclusion the crux of main issues and solutions would be summed up.

## **Section “ A” / Question 1: Capacity measurement with details**

There is no fit for all formula for capacity measurement as businesses vary in their nature and details. A theatre measures capacity in terms of seats and a job shop can measure capacity in number of machine hours (Krajewski, Ritzman and Malhotra, 2010). Jones and Kutsch (2007) are of the opinion that space and equipment hold primary position in capacity measurement thus the measurement would be centered around them.

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Main complaints are from two issues i. e. unavailability of equipment (Cardiovascular, Nautilus and aerobics) and workout activities being overcrowded. Thus the focus of capacity management in aerobics should be on space and equipment for the workout activities in peak hours. According to the study it is noted that peak times are between 4-7pm and total number of members visiting between that time is 240 (80 per hour). For analysis purpose the figures from the conducted survey (Appendix 1) have been used as following:

Nautilus: It consists of 24 pieces of equipment and it is assumed that on an average each member takes 45 minutes to complete the whole course. In one hour the total number of members able to use the equipment would be  $(60 \text{ minutes} / 45 \text{ minutes} \times 24 \text{ equipments} = 31 \text{ members})$ . The current usage during peak time is 25% of capacity equalling 20 members per hour.

Cardiovascular: It has 29 pieces of equipment and it is assumed that each member takes 45 minutes to complete the exercise. Thus in one hour the total number of members able to use the equipment would be  $(60 \text{ minutes} / 45 \text{ minutes} \times 29 \text{ equipments} = 38 \text{ members})$ . The current usage during peak hour is 40% of capacity equalling 32 members per hour.

Aerobics: The facility can accommodate 35 members in one session and normally each session lasts for one hour. Thus the current usage during peak hour is 30% of capacity equalling 24 members per hour.

Free weights: The case study doesn't hold any details about the space or type of available equipment. There are no complaints arising and 20% of the

members use the facility during peak hours which equals 16 members so we assume that it is being utilized appropriately.

Recreational activities: There is sufficient room available to accommodate the members during peak hours. Six tennis courts can accommodate between 12 to 24 members to play either 6 single or double games whereas currently only 8 members play tennis during peak hours. Same is the case for 8 racquet ball courts which can accommodate between 16 to 32 members for 8 singles or doubles matches. During peak time only 12 members play racquet ball. The assumptions are based on the average calculation of each game to last for 1 hour. In case of longer game sessions still there are plenty of courts available to accommodate the demand.

Detail of equipment and space are as following:

### **Further analysis:**

Yu Lee (2002) is of the opinion that correct measurement of capacity is a pre-requisite for the effective management because correct decisions are always based on correct observations. It is a dilemma that one can not precisely measure the utilization capacity for service organizations as it needs constant surveys and observations (Jones and Kutsch, 2007). It has been observed that all the capacity measurements which can be taken are based on the primary data i. e. equipment condition, physical space, type of members, frequency of use, the type of equipment and support system (Yu Lee, 2002). For Fitness Plus another useful capacity measurement technique would be “ Utilization” which is used for equipment, workforce or space.

Utilization is the ratio between actual average output of the equipment and the maximum capacity (Krajewski et al., 2010).

**Utilization = (Average output rate / Maximum capacity) x 100%**

From the data available in (Figure 1) we can measure the utilization of different equipments as following:

Nautilus utilization =  $20/31 \times 100\% = 64.5\%$  (35.5% below capacity)

Cardiovascular utilization =  $32/38 \times 100\% = 84.21\%$  (15.79% below capacity)

Free weights utilization =  $16/16 \times 100\% = 100\%$  (Full capacity).

Tennis courts utilization =  $8/12 \times 100\% = 66.66\%$  (33.33% below capacity)

Racquet ball courts utilization =  $12/16 \times 100\% = 75\%$  (25% below capacity)

Aerobics Utilization =  $24/35 \times 100\% = 68.5\%$  (31.5% below capacity)

For aerobics the full capacity of the room is 35 members at one time which is way above the peak time average of 24 members. Scheduling of aerobics room can be the cause of the problem as the same room is twice a week dedicated for classes of yoga.

Based on the above results it can fairly be said that Fitness Plus has enough capacity to effectively manage its existing facility and reduce complaints.

There is also a need to determine the type of members using the facilities in peak hours i. e. family groups, under 16 students and working adults etc.

It will be essential for both short and long term capacity strategies to cater for these groups separately in order to gain the competitive edge. A study should also be conducted to check the condition of the equipment as complaints might have arose partially due breakdown. It should also determine popular machines among the members specially for the cardiovascular and nautilus so the least popular be replaced with the more popular ones to increase the existing capacity.

All capacity management plans not only determine the current usage of capacity but also take into account the future fluctuatins in demand. Existing or planned capacity should always leave sufficient cushion for adjustments (Krajewski et al., 2010). Capacity cushion is calculated as 100% minus the percentage of utilization. Upto 10% is considered sufficient to adjust demand fluctuations over time.

### **Capacity cushion = 100% – Utilization rate (%)**

In case of busy health facilities any number of customers can come at any time to use the equipment or space varying the demand significantly thus 20% capacity cushion would be more appropriate to maintain good customer service levels and to suatain any membership increases. Calculations are as following:

$$\text{Nautilus cushion} = 100\% - 64.5\% (\text{utilization rate } \%) = 35.5\%$$

$$\text{Cardiovascular cushion} = 100\% - 84.21\% (\text{utilization rate } \%) = 15.79\%$$

$$\text{Free weights cushion} = 100\% - 100\% (\text{assumed utilization rate } \%) = 0\%$$

Tennis courts cushion =  $100\% - 66.66\%$  (utilization rate %) = 33.33%

Racquet ball courts cushion =  $100\% - 75\%$  (utilization rate %) = 25%

Aerobics cushion =  $100\% - 68.5\%$  (utilization rate %) = 31.5%

Fitness Plus equipment and facilities have sufficient existing cushion. The only exceptions are cardiovascular equipment with 15.79% which is not too low and free weights equipment. There is no data available for free weights thus an assumed utilization of 100% is considered which can not be true in reality. On the basis of above calculations and analysis it can be fairly said that Fitness Plus has sufficient capacity to deal with current and future demand fluctuations. An efficient capacity management can result in a significant decrease in complaints and increase service levels and customer satisfaction.

## **Section “ B” / Question 2: Capacity strategy and justification**

One of the most difficult challenges service managers face is to cope well with uneven demand. The frequent fluctuations in demand can lower service levels or result in under utilisation of resources. To avoid these consequences service firms can either adjust their capacity according to the changing demands, influence a change in demand patterns to suit their capacity or a combination of both (Krajewski et al., 2010) (see below figure 2):

There are three main capacity strategies i. e. level capacity, chase demand and demand management. Each of these strategies should be adopted when its advantages outweigh the disadvantages. Most often operation



managers are required to keep low costs, decrease investments and at the same time provide excellent customer service levels making it all the more important for organizations to adopt a mixture of these approaches (Jones and Kutsch, 2007). Fitness Plus should adopt a mixed capacity plan for both its short and long term strategy as explained and justified in the following paragraphs:

### **Level capacity:**

The capacity is maintained at a constant level all along the planning period and any fluctuations in demand are ignored. High under utilization of resources can make this capacity option very expensive but also very useful where the opportunity cost of single lost sale is very high like in jewellery retailing or real estate (Jones and Kutsch, 2007). At Fitness Plus there is always a possibility of a large number of members coming in any time and very low number of members in off-peak season resulting in either a waiting line or under utilization thus a pure level capacity plan would not be suitable.

### **Chase demand:**

Chase demand is opposite to level capacity as it tries to match the capacity levels according to the changing demand patterns. It is very difficult plan to act upon as it needs flexible working hours, different number of staff and often different number of equipment in each period. It is suitable for companies which produce either perishable goods or cannot store their outputs such as customer processing. It has a clear advantage of having the appropriate level of staff all the time according to the demand of a particular season (Krajewski et al., 2010). This method requires adjustment of capacity

through different means i. e. offering over time in peak and lesser hours in <https://assignbuster.com/capacity-management-and-international-operations-management-commerce-essay-essay-samples/>

off-peak periods, varying number of employees according to the seasonal requirements, part time contracts and subcontracting (Jones and Kutsch, 2007). Fitness Plus would need to chase demand in the below aspects:

As per available data members complain about waiting for the availability of equipment. Application of a waiting line model will increase the service levels by effectively managing the existing capacity and chasing the current demand.

A survey is proposed to check which machines are in demand, increasing their numbers and decreasing the least used ones to be in line with the existing demand.

A waiting line model will not be suitable for aerobics because the class is preplanned and majority of the members arrive just before the start thus mixing schedules between aerobics and yoga can solve the problem.

The number of employees would need to be rescheduled to increase the current service levels. It will reduce excess staff during slower times shifting them to peak times resulting in more personal attention, interaction and customer satisfaction.

Developing a new facility will also chase the increase in demand which is expected due to new businesses down town.

### **Demand management:**

The objective of this strategy is to shift the burden of peak period to off-peak period. Either the demand is changed through various methods or alternate

products or services are offered to fill off-peak capacity. The most widely applied method in service industry is pricing to shift the peak demand to off-peak when people are not very interested in buying. Advertising also helps to smooth demand but is expensive and if is un-planned can result in financial loss. Organizations with different demand patterns develop new products and services covering the whole year i. e. universities filling the lecture rooms during vacations (Jones and Kutsch, 2007). Fitness Plus will be managing demand in certain aspects of its strategy:

It is proposed that Fitness Plus should either slightly rise prices during the peak times or provide services which cost lesser to manage demand.

They should offer different types of memberships with different prices called price optimization.

A non-pricing strategy of advertising off-peak services to waiting customers during peak times would also balance the peak and off-peak demands.

Distributing off-peak service coupons during peak times, discounted tickets for relaxation services like massage, health supplements or energy drinks can be offered to balance the demand year round.

Through a system of reservations Fitness Plus can fill its capacity and move the excess memberships to the off-peak period by booking a slot when capacity is available to manage it more effectively.

Another option can be to partially restrict access of members during peak periods. During peak times mostly members would be working executives

thus a restriction can be applied on under 16 members. To compensate them  
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student membership rates can be offered in the off-peak period to encourage members to come more often in off-peak.

Employee scheduling should reduce the excess staff during slower times by shifting more employee to peak times. It will result in more customer satisfaction and effective demand management.

Often service companies have to opt a mixed capacity strategy as it is very hard to forecast demand and balance existing capacity (Jones and Kutsch, 2007). Operational capabilities do not always match one of the three strategies thus a mixture of chasing and managing demand would be most suitable for Fitness Plus.

### **Section “ C” / Question 3: Capacity strategy and other operational decisions**

Any capacity decision an organization makes should always be in line with the supply chains and processes within the organization. Taking into account the bigger operational picture is essential for a successful capacity strategy (Krajewski et al., 2010). Both short and long term strategies are discussed in this context below (See Figure 4):

#### **Short term strategy:**

##### **Waiting line model:**

Peak demand most frequently results in waiting time increases for customers. Waiting line model is considered very useful for service organizations in resolving the problem (Krajewski et al., 2002). This model can be applied to the workout equipment as the waiting line is resulting in bottlenecks. Currently the system is catering for members individual service <https://assignbuster.com/capacity-management-and-international-operations-management-commerce-essay-essay-samples/>

needs in multiple lines with a mixed arrangement of facilities on first come, first served basis.

The arrival and service time distributions need to be calculated including line lengths, number of customers in the system, waiting time, total time in system and utilization of service facilities. After analyzing this data a new layout of the facility might be needed increasing the peak capacity and space for some equipment and reducing or eliminating some. Total 32 members visit the workout room during peak hours taking 45 minutes in completing their routines. On an average each member uses 2 machines during their stay with 20 minutes on each machine plus 5 minutes for the next one. Three customers get served with 20 minutes and an average the arrival rate comes to 2.5 times during an hour. If we take into account repeated visits we get a 80 per hour arrival rate ( $30 \times 2.5$ ) thus members wait approximately 8.6 minutes for a machine. To resolve it the most appropriate model would be a multiple channel, single phase as it will have a single line and more staff to deal with customers (See Figure 3 below):

Operationally this model will facilitate the marketing, HR, finance and supply chain aspects as during peak hours the waiting customers would be in a single line making it easier to display the marketing material on surrounding walls or screens. Financially it will save the expensive investment in media advertising and will make off-peak brochure distribution easier and to more interested existing customers. To serve on multiple service counter HR will need to schedule employees i. e. reducing the excess staff during slower times by shifting more employee to peak times resulting in better customer service. This model will also stream line the supply chain processes and <https://assignbuster.com/capacity-management-and-international-operations-management-commerce-essay-essay-samples/>

increase service levels. During waiting line news telecasts and entertainment like BBC, Sky Sports etc with seated customer will create a calmer waiting environment and defuse any possible difficult situation.

### **Price related strategy:**

Fitness Plus can reduce demand during peak hours by diverting surplus users either slightly rising prices or providing services which cost lesser. It can offer different types of memberships with different prices. The best price should be determined keeping in mind that no capacity constraint occurs which is called price optimization.

Financially, increasing prices would generate extra revenues as per Shugan (2004) price optimization moves demand from peak to off peak times and increases revenues. But service firms are often hesitant due to its long term negative effects on the business. The presence of strong competitors often makes price increase decisions difficult as a customer can try competitor services and it might result in customer loss. Price increase strategy can also increase pressure on the over all supply chain as customers will start expecting higher service levels and seamless operations. By offering different type of memberships HR might need to recruit more staff to attend customer in both seasons. It can indirectly increase marketing costs as less expensive methods of selling to regular customers in peak season will become less effective due to lesser number of customers.

### **Non-pricing strategies:**

Peak time is best to contact customers who might be interested in the off-peak offers and services (Kotler, 2001). It is highly likely to come across

potential customers during Peak periods rather than less direct methods of advertising. In the earlier case customers have already shown their interest in the services and facilities. Thus it is far easier to sell them the off peak services or packages. While waiting for their turn customers can be shown different advertisements to promote off-peak services which will save money for more expensive marketing campaigns. For regular members off-peak coupons can give further discounts or additional services with minimal incurring costs like massage, health supplements or energy drinks.

Another strategy would be to develop a reservation system. It helps to shift the members to off-peak period who would otherwise be waiting during the peak period. When a customer calls to reserve a service or facility he should be given the slots with available capacity. The system works best if it is automated thus optimizing and balancing demand and capacity at the same time. These systems do improve the over all supply chain but also affect financial and HR related operational decisions as they are expensive and need trained staff to operate them.

Fitness Plus can also partially restrict access of members during peak periods. A detailed study of the type of members visiting the facility would be needed. Once the data has been gathered on the usage pattern the decision of categorical restrictions can be applied. For example during peak times of 4-7 mostly members would be working executives thus in order to reduce access and optimise the capacity a restriction should be applied on under 16 members using the facility in the same period. To compensate them student membership rates can be offered during the off-peak period.

This will encourage the excluded members to come more often during off peak periods.

Fitness Plus should also have a survey to determine the popular equipment. The number of popular equipment should be increased and the least popular ones be decreased which will help fill the gap in member requirements. Operationally it can create a supply chain problem of disposing off the least popular equipment and can increase financial pressure of buying new machines.

In case of aerobics section complaints there is a possibility of a mixed schedule between aerobics and yoga. A rescheduling of classes on the basis of member's demand can ensure that the classes do not clash. It will affect the HR decisions as employee scheduling would be needed and over time might need to be paid.

The employees of Fitness Plus also need to be scheduled in order to increase the service levels and reduce the excess staff during slower times. Shifting more employee to peak times will result in more customer satisfaction by having more personal attention and interaction. It will benefit the supply chain by improving process times and facilitating seamless operations.

### **Long term strategies:**

There are three alternates in the long run which should be based on both qualitative and quantitative bench marking of competitors, capacity and cost estimates:

Opening of a new facility downtown



Minimal expansion within the current facility on available land

Waiting and watching the demand conditions before making any expansion

Because customers are already complaining and equipment is being used lesser than its maximum capacity there is some room for minor expansion of the existing facility but is limited due to lack of available land. As the population is increasing steadily and the only full range competitor is YMCA option 1 would be the best choice. It will create sufficient capacity ahead of customer demands. Once the new facility is announced it will be difficult for competitors to expand as it might over burden the market.

Financially it is a big decision and would very much depend on the success of the short term strategies. Profits gained through short term measures will ease the financial pressure. Secondly going ahead with new facility downtown will need thorough supply chain planing as the distance between the facilities will make logistical decisions difficult and expensive. Lot of new job will be created and HR department will need to recruit and send and recieve staff between facilities for training and development purposes. It will be a big opportunity for marketing deparatment as lots of new campaigns, hoardings, billboards and advertisements would need to be developed.

## **Conclusion:**

In this report the capacity issues of Fitness Plus were discussed in details in three sections. A measurement of existing capacity, justification of adopted strategy and links of proposed strategies with other operating decisions were sought. Both short and long term strategies are considered important but the

immediate concern of Fitness plus should be to resolve the existing complaints of over crowding and non-availability of equipment.

Firstly, in the short term price optimizing strategy of increasing peak prices and offering off-peak packages can work. If it is considered detrimental for the business non-pricing strategies can produce the desired results.

Secondly, all the employees should be taken on board in the strategic decisions so that they can handle customer queries more professionally and maintain the desired service levels. Lastly, periodical reviews of the demand forecasting, complaints, equipment and service levels will ensure effective capacity utilization. Accuracy of data should be maintained by comparing the existing demand with the forecasted demand so that a clear picture of the financial, operational and service needs is obtained.

In the long run Fitness Plus needs to refer to its corporate objective and act accordingly either to effectively manage the current equipment and space or build a new branch over time. The earlier the long term strategy is initiated the better. Once the expansion plan is announced new memberships will prove to be a gauge for its success and continuous monitoring of population growth, market trends and competitors will keep Fitness Plus ahead of its competitors.