

Utilization Rates, Charge Rates and the Pricing of Services

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INTRODUCTION

The proper pricing of services is a subject that must be addressed by all service companies. If prices are set too high, there may not be sufficient revenues generated to meet profit targets. On the contrary, if prices are set too low, revenues may not cover all costs. The company's managers must understand the relationship that exists between pricing and profitability. More importantly, the nature of this relationship, as it applies specifically to their company, must be identified and used if profit targets are to be achieved.

For many service companies, pricing is done through the use of utilization rates and charge rates. The charge rate for an employee is usually a multiple of the wage rate paid to that employee; this charge rate is a form of cost oriented pricing. The multiplier is used to cover all costs and to include a desired profit margin. The charge rate and the utilization rate determine the revenue generated from that employee. These utilization rates are often also used as measures of employee productivity.

Utilization rates measure the productivity of employees in a given time period using a percentage of chargeable or billable time to total time worked. Service companies, whose product is the time of their employees, commonly set target utilization rates for man-

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173

agers and base performance evaluations and bonuses on these rates. Implicit in this practice of targeting utilization rates as the primary financial objective of managers is an often misinterpreted relationship with profitability. The questions arise as to whether these rates should be the primary financial management objective, and whether their targets actually maximize the profits of the company.

This paper answers these questions by developing a model to demonstrate the relationship between the company's profits and its utilization rates and charge rates. To test the validity of the use of utilization rate targets for profit maximization, simulation is used. The results of the simulation analysis provide valuable insight for the use of utilization rate targets and charge rates.

MODEL DESCRIPTION

Assume that within a department, each employee charges or bills at a competitive rate, c , for their skills. Their charge rate is some multiple, m , of their wage. The size of m is a function of the magnitude of the company's costs (benefits and overhead) and its desired profit margin. The company's total cost consists of wages and overhead.

$$\begin{aligned} \text{wages} &= \Sigma \text{ charge rate/multiplier} \\ &= \Sigma c/m \\ \text{overhead} &= O \text{ constant fixed cost} \\ \text{total cost} &= \Sigma \text{ wages} + \text{overhead} \\ &= \Sigma c/m + O \end{aligned}$$

The chargeable hours of the employees are the primary source of revenue generation in service companies. Therefore the revenues are the sum of the product of the individual charge rates and utilization rates. Profit is the difference between revenues and total costs.

$$\begin{aligned} \text{revenue} &= \Sigma (\text{charge rate})(\text{utilization rate}) \\ &= \Sigma (cu) \end{aligned}$$

$$\begin{aligned}\text{profit} &= \pi = \text{revenue} - \text{total cost} \\ \pi &= \Sigma (cu) - [\Sigma(c/m) + O]\end{aligned}$$

In order to determine the maximum profit as a function of the utilization rate, the first and second derivatives are used:

$$\begin{aligned}\partial\pi / \partial u &= c \\ \partial^2\pi / \partial u^2 &= 0\end{aligned}$$

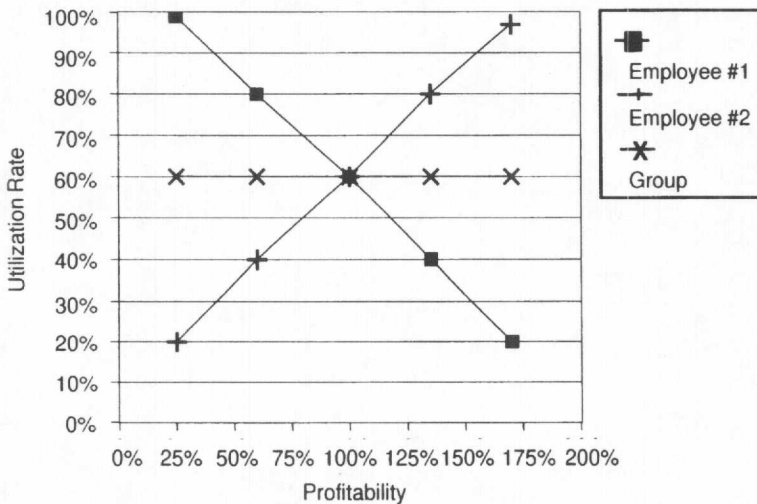
Therefore, no maximum exists and profits are a linear function of utilization. The slope of the line is the charge rate, c . Therefore, profits are the greatest at higher utilization and charge rates. Given the nature of the model, this conclusion is not a surprise. However, the important question of how utilization rates and profitability are related is addressed below in the simulations.

SIMULATIONS

To illustrate the misuse of utilization rates as financial management targets, we will simulate a department composed of two employees with a target utilization rate of 60%. The profitability when all employees are 60% utilized will be referred to as the target profitability. Assume that Employee #2 has a charge rate twice that of Employee #1. Utilization rates for the department are an average of the employee's individual utilization rates and the department's profit is the sum of individual profits.

Figure 1 shows the profitability of the department as a function of both the individual and department's utilization rate. When both employees are utilized at 60% rates, the department will achieve its 100% profitability. The department can increase its profitability by 70% if Employee #2's utilization rate is increased to 100% while employee #1's falls to 20%. In the opposite extreme, departmental profitability will decrease by 70% if Employee #2's utilization rate falls to 20%, while Employee #1's increases to 100%. In all cases the department's utilization is fixed at 60%, yet the department's profitability ranges from 30% to 170% of the target profitability. When the higher paid employee has a greater utilization rate, profits

FIGURE 1. Variations in profitability as a function of utilization rates for a two employee department with charge ratios of 2:1.

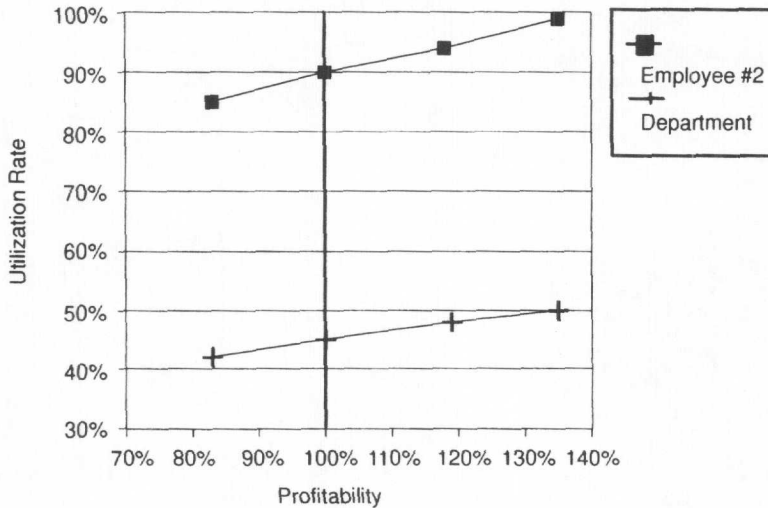


can increase substantially even with a constant departmental utilization target.

A second simulation demonstrates the effect of increases in utilization of the higher charge-rate employee on profits. Figure 2 shows that in the worst case scenario of when Employee #1 has a utilization rate of 0%, the target profitability of 100% is reached when the higher charge rate employee has an individual utilization rate of 90%. The department utilization rate is 45%; well below the target utilization rate of 60%. Above this rate a manager may exceed the profitability targets of the company but will not meet the utilization rate target of 60% which is usually the basis of the manager's performance evaluation. When the higher charge rate employee has an individual utilization rate of 100%, the department exceeds its target profitability by 35% yet falls 10% (60%-50%) below the utilization rate target.

The sensitivity of profitability to the utilization of Employee #2 (the higher charge-rate employee) is shown in Figure 3. If both employees meet their 60% utilization rate targets, the department will achieve its 100% profitability target. Assuming that Employee

FIGURE 2. Effect of utilization of higher charge rate employee on a department's profitability and utilization rate.



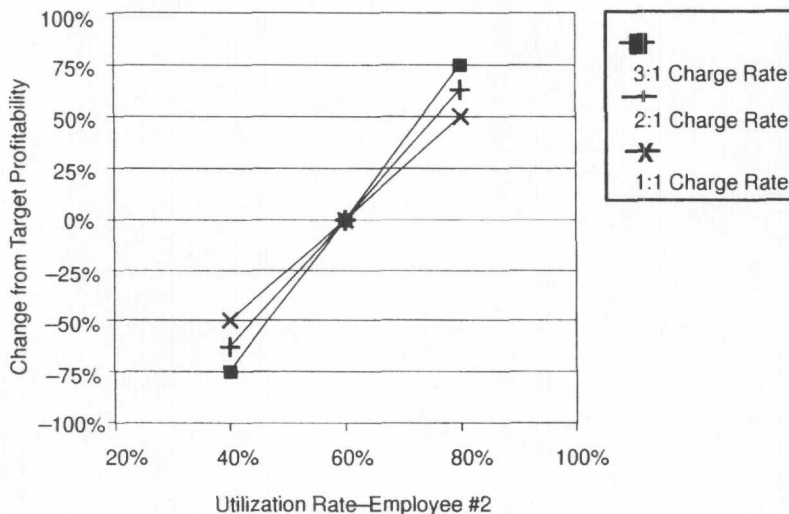
#1 meets a 60% utilization rate, variations in the profitability target range from -67% to $+67\%$ as Employee #2's utilization rate increases from 40% to 80%. The profitability is also sensitive to the ratio of the charge rates; if the ratio of charge rates had been 3:1, the variations would have ranged from -75% to $+75\%$. For a 1:1 ratio, the range would have been from -50% to $+50\%$.

Figure 4 illustrates the sensitivity of the utilization of Employee #1 (the lower charge-rate employee) on the profitability target. The variations in the profitability target range from -33% to $+33\%$. If the charge-rate ratio had been 3:1, the variations would have ranged from -25% to 25% . A smaller charge-rate ratio of 1:1 would have resulted in a profit variation range of -50% to $+50\%$. In contrast to Figure 3, the smaller charge-rate ratio of 1:1 is more sensitive to changes in the utilization rate of Employee #1.

CONCLUSIONS

The effect of utilization targets on the profitability of a department with numerous employees will depend on the distribution of

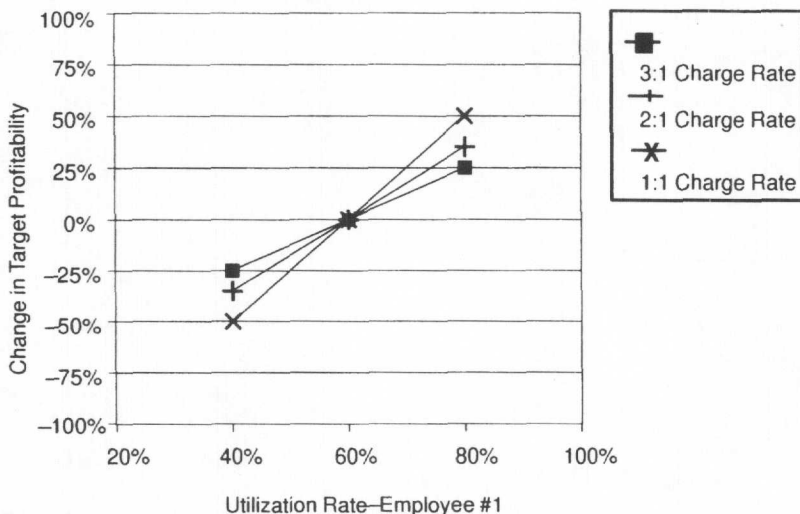
FIGURE 3. Change in profitability as a function of higher charge rate employee's utilization for various charge rate ratios.



the charge rates. This study has clearly shown that utilization targets are a poor indicator of the profitability of a department. The profitability will be affected by changes in the utilization rates, and the variation in the profitability will depend on the utilization rate changes and the charge-rate ratios of the employees in the department. Financial managers would be far more effective by setting explicit profitability targets or, when all costs cannot be allocated to a department, by setting revenue targets for departments.

A further implication of this study is that service industries would be more profitable by hiring higher wage employees who could charge at higher rates. Entry level employees have a less significant contribution to the profitability of the company. Training should be concentrated at the lower charge rate employees in order to increase their skills and hence their competitive charge rate. The non-chargeable time involved in training will have less of an impact on the profitability of the company for the lower charge-rate employees, and the upside potential on profit from the higher charge rates will be worth the investment.

FIGURE 4. Change in profitability as a function of lower charge rate employee's utilization and charge rate ratios.



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