

Capacity Management in Service Industry – Influenced by External Environmental Factors

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Abstract

Capacity management in services to match supply and demand has a direct influence on the ability of the service delivery system to achieve service quality and resource productivity targets. The paper examines influence of external environmental factors over resource productivity and hence over the capacity management in service industry. There is not the possibility of producing the complete service package in advance of demand and holding it as an Inventory. This real time element of service production makes the matching of supply and demand very important, particularly in capacity constrained services like airlines and hotels when the profitability of the operation is closely linked to the use of the current capacity. The capacity of service sector mainly depends on capacity of doing work of a human being delivering services and hence on some external environmental factors influencing the personnel involved in service delivery. The human capacity depends on many external factors which work as variable at the time of delivering services. Operation managers must be fully aware of the implications of the possibility of rise and fall in capacity due to these factors, also to incorporate in capacity planning and management.

Keywords: External Environmental factors, Service operations, Capacity, Capacity Planning, Capacity Management.

Introduction

Capacity management is one of the major issues in operations. It is important to meet the organizational goal efficiently and effectively. In general capacity is ability to hold, receive, store or accommodate. It is most frequently viewed as the amount of output a system can achieve over a specified period of time. In manufacturing organizations capacity is measured in terms of rated output of machines / system of machines which produces specified quantity in certain period of time. The variables over which the manufacturing further depends are – Availability of work force, availability of funds, availability of material (Raw material, consumables, spare parts, sub assemblies, tools and miscellaneous items), availability of other resources (electricity etc.)

In case of service industry, the work force replaces major part of machines and material, and hence we can say human resources in service industry acts as man, machine and material. When we think about the capacity, operation manager need to consider both resource inputs and service output. Capacity planning is strategic decision in manufacturing organizations. The major determinants are demand of finished product, availability of machines and equipments, availability of labour, availability of material.

In service industry, capacity is often directly related to the number of workers present in a service center and flexibility in external environmental factors

with respect to time. Hence, working time flexibility and accordingly flexibility in External environmental factors plays a major role in obtaining capacity.

If we consider service production like insurance, hospital, hotel, tourism, education, etc. Human resource is most important factor, which replaces a major part of machines, equipments and material from manufacturing industry.

In operation management the human resources are also treated as machine whose capacity of working/ production in terms of man-hour is fixed to simplify the models and theories. But the capacity of human being differ time to time, person to person, place to place.....etc. depending on change in buying power of client, climatic conditions, client's experience, client's mood, client's qualification, demand of product , cultural and social influences etc. We can't compare the output of two personal due to influence of these factors on the basis of their working hours, as people involved in service operations may also be influenced by external environmental factors.

Literature Review

Review of “On the Interface Between Operations and Human Resources Management September 22, 2002” –by John W. Boudreau, Wallace Hopp

It is reviewed that “The fields of Operations management (OM) and human resources management (HRM) have a long history of separateness. The authors stated, “ Operations management (OM) and human resources management (HRM) have historically been very separate fields. In this paper, authors probe the interface between operations and human resources by examining *how human considerations affect classical OM results and how operational considerations affect classical HRM results*. Authors then propose a unifying framework for identifying new research opportunities at the intersection of the two fields.”

The Impact of Human Resources on Operations Management, it is reviewed that “Simplification is an essential part of all modeling, OM researchers and managers are aware that their models involve simplified representations of human behavior. But they may not always be aware of the consequences these simplifications can have on decision-making. To gain insight into this issue, authors begin by listing some of the most common assumptions used to represent people in OM models.”

The following assumptions are commonly used to simplify human behavior in OM models.

1. People are not a major factor. (Many models look at machines without people, so the human side is omitted entirely.)
2. People are deterministic, predictable or even identical. People have perfect availability (no breaks, absenteeism, etc.). Task times are deterministic. Mistakes don't happen, or mistakes occur randomly. Workers are identical. (Employees work at the same speed, have the same values, and respond to same incentives.)
3. Workers are independent (not affected by each other, physically or psychologically).
4. Workers are “stationary.” No learning, tiredness, or

other patterns exist. Problem solving is not considered.

5. Workers are not part of the product or service. Workers support the “product” (e.g., by making it, repairing equipment, etc.) but are not considered as part of the customer experience. The impact of system structure on how customers interact with workers is ignored.
6. Workers are emotionless and unaffected by factors such as pride, loyalty, and embarrassment.
7. Work is perfectly observable. Measurement error is ignored. No consideration is given to the possibility that observation changes performance (Hawthorne effect). While assumptions such as these can greatly simplify the mathematics, they can omit important features.

This would be a clue that important human factors may have been overlooked. Once a feature of human behavior has been recognized, incorporating it into the analysis can lead to better OM models. For example, many classical operations models assume that people are like machines, effectively identical to one another and exhibiting only random performance variation. Yet, individuals differ in skills, speed and many other characteristics; this is the most basic of HRM and industrial psychology insights. So, it is not surprising that some of these classical models do not match reality very well.

Review of “A Multilevel Investigation of Factors Influencing Employee Service Performance and Customer Outcomes – by Hui Liao, Aichia Chuang.

In this paper the Authors state that “it is important to understand what predicts employee service performance. The purpose of this study was to develop and test a multilevel framework in which employee service performance was examined as a joint function of employee individual characteristics and service environment characteristics.

Review of “ Concept of Productivity in Service Sector “ – by Jonas Rutkauskas, Eimen_Paulavicien

According to authors “Productivity shows whether the activity of an organization is efficient and effective. Though the terms like productivity, efficiency and effectiveness are used together and practitioners sometimes alternate their meanings, however we must not identify productivity with efficiency and/or effectiveness. Productivity requires both efficiency and effectiveness, because a certain activity will not be productive if it is only efficient, but not effective, or effective, but not efficient. Productivity in economic position is defined as the relation between output and input. Input element in an organization consists of resources used in the product creation process, such as labor, materials, energy. Output consists of a given product, service and the amount of both. Mostly productivity is analyzed in manufacturing sphere. Productivity in the service sector was not analyzed before the end of the twentieth century, while productivity in manufacturing has been analyzed for more than two hundred years. Many researchers argued that application of productivity concept in service sector is more complicated task than its application in manufacturing.”

Productivity concept in manufacturing is analyzed in the scope of organization, but in the service sector this scope is larger and involves an external element from the organizational position –

customer. Some of the service organizations reduce an input element by including customer to their activity and thus boosting service productivity. The quality aspect in manufacturing is not gauged, because input and output are measured by quantity units which quality is seemingly the same. The quality in service sector is very important. Customers often evaluate a given service not only by its amount. If only one unit or package of service is purchased, output is mostly gauged only by the quality aspect. Input commonly is gauged both by the quantity and quality aspects. Quantity and quality aspects in the determination of productivity will differ in different spheres of service sector. Service sector input elements such as materials, machines and energy are not as important as in manufacturing. The main element in service sector is labor because service sector is more personnel-intensive comparing to manufacturing. Output in manufacturing is measured by quantity units and boosted by increasing the amounts of production, its realization. Service sector output usually has no high values by the quantity aspect; therefore it is mostly increased by the attempt to provide higher quality services to the customer, seeking for better customer satisfaction.

Review of “Capacity Management In Services And The Influence On Quality and productivity Performance” – by Colin G Armistead and Graham Clark

According to author “It is our contention that the aspect of the delivery of services which has received insufficient recognition is the management of capacity. An operations manager in a service business will either succeed or fail in the process of balancing quality of service and resource management, expressed in terms of resource productivity, depending on their skill in managing capacity to match demand. This paper examines more closely the factors in the management of capacity, which affect quality and productivity performance.” It is also stated “Capacity management is the ability to balance demand from customers and the ability of the service delivery system to satisfy the demand”.

Understanding Capacity - Defining Capacity - The definition of capacity is not always easy for a service operation. What is the capacity of a lecture room, a surgical ward, a supermarket, or a passenger ferry? Is it the number of seats, the number of beds, the square meter age, the number of seats and berths? Whereas these measures may indicate key resources to be managed they are static measures and are therefore unlikely to take account of all the factors, which affect capacity.

The individual resource may be one person, a person acting with equipment like a VDU, or a piece of equipment the customer uses. Operations managers must be aware of the capacity of those individual resources, which restrict the output of the overall operation.

Factors Influencing Capacity - When deciding on the effective capacity it is necessary to consider the quantity and nature of the input factors and also the amount of work, which needs to be done to produce the service. Here it is necessary to recognize the three adding value activities for all productive systems, namely, improving, transferring, and care taking (Armistead 1990) The inputs to the service delivery system which are recipients of the added value are materials, information or people, as customer, clients etc. When considering effective capacity there are three main influences, which need to be, understood which relate to the

work on the adding value activities.

Objectives –The objective in general is to understand the relation between capacity of service industry and behavior of its human resources. Specifically, to understand exactly how external environmental factors in any service industry influence its capacity of working. Also to find out significance of external environmental factors over work force as service provider and client as service gainer in capacity management of service industry.

Significance - As it is assumed in determining the capacity of services in operation management that human being are rational or trained to behave rationally. Their capacity is assumed simply in man-hour units, which may differ person to person, place to place and time to time because of they are affected by external environmental factors, at the same time customers or clients may also be affected by these factors.

Social consideration- Treating human being as rational machine and evaluating their output on man-hour basis and determining capacity accordingly is not fair, because the personnel involved in service production are influenced by external environmental factors. These factors must be incorporated in service capacity determination.

Economic Consideration- in any service industry human resources replaces a major part of machines and material, and also human being itself is a major operator of the industry, known as driver of the industry. Determining capacity on the basis of man-hour may be harmful to the industry, because person may differ in output, efficiency, effectiveness, providing quality, learning capacity, due to their influence of external environmental factors.

Hypothesis – 1) External environmental factors affects the capacity / capacity management of service industry. 2) External environmental affects the capacity of service production significantly.

Rationale – The output of services depends on type of service required and different types of service production depend on external environment affecting the people involved in service production. As work force is major resource in service industry, to determine the capacity of service production significantly depends on individual's capacity, which further depends on factors like economy, social segment, culture, technology etc. at the time of service provision. The favorable external factors may increase demand and hence the service production capacity, at the same time vice-versa may also be true. Determining the interface between capacity and external environment is a major issue in service industry management.

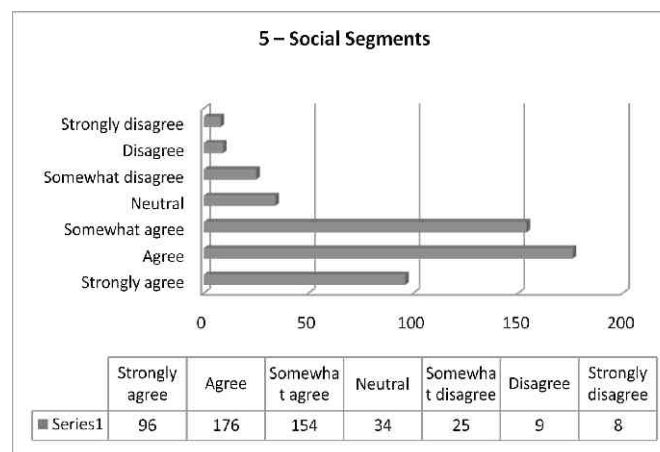
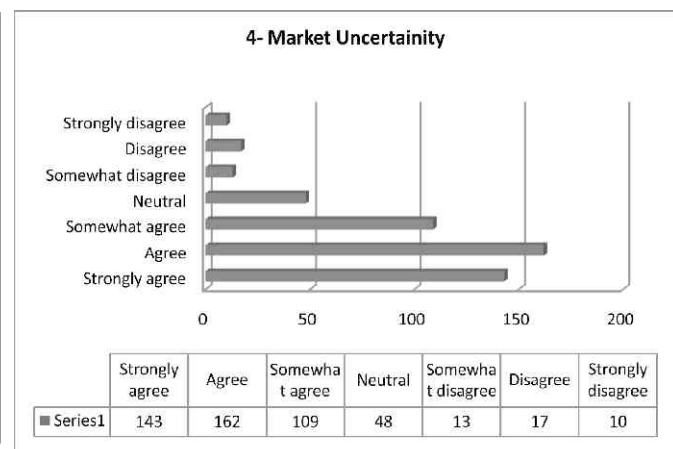
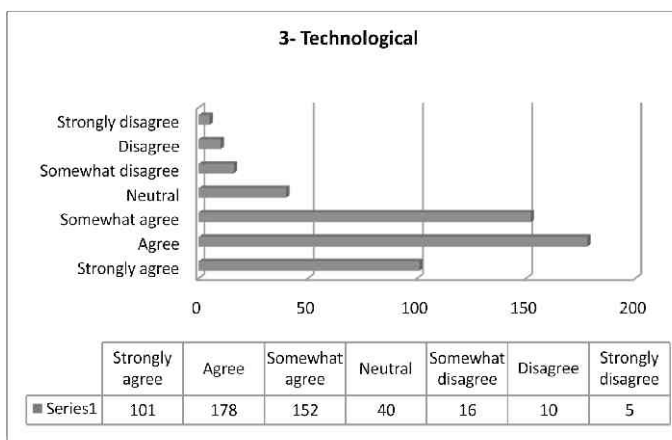
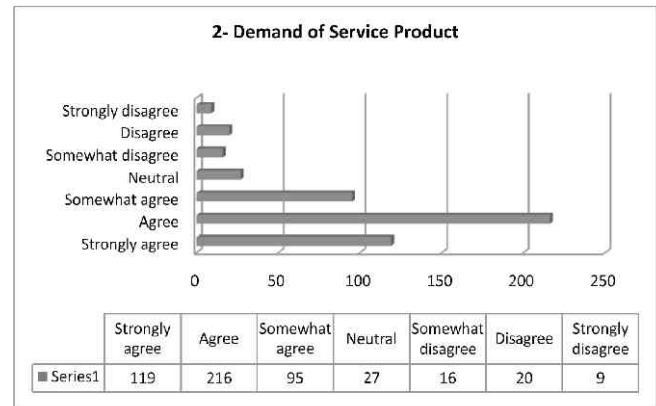
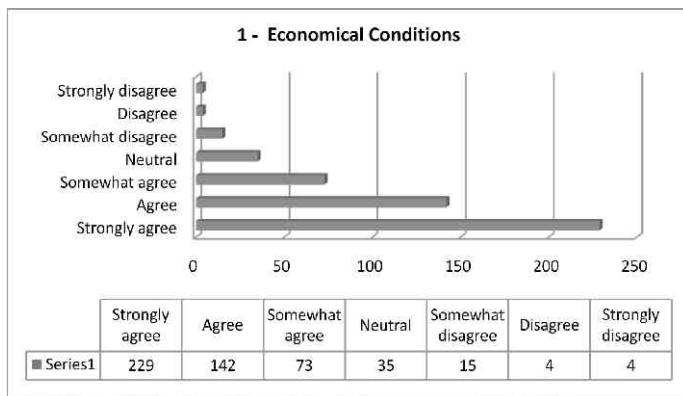
Methodology – The study is descriptive and cross sectional in nature, well structured questionnaire is used for our study. Ten external environmental factors are taken for study as secondary data form literature review. The response of each factor is taken on Likert scale of seven – strongly agree, agree, somewhat agree, neither agree nor disagree, somewhat disagree, disagree and strongly disagree. **Sample** - The focus group is professionals of service industry. They are questioned on their view towards the effect of external environmental on their service providing capacity.

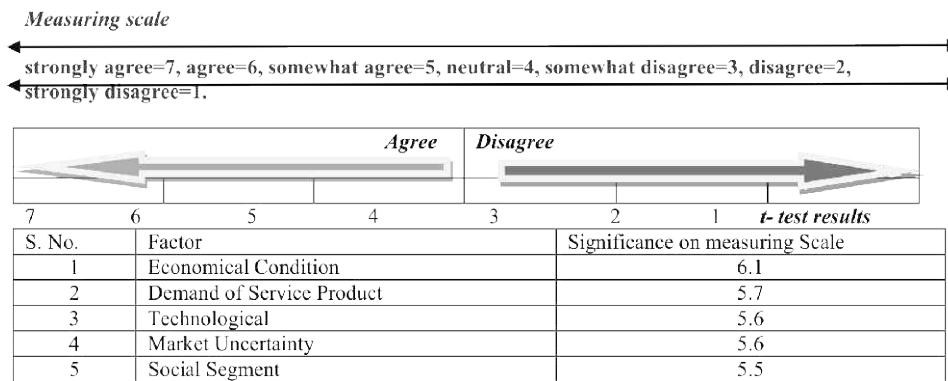
Data Collection – In this research secondary data are used for

identifying the relevant variable on the basis of which the questionnaire is designed. In this research primary data are collected by structured questionnaire. The questionnaire is prepared based on external environmental factors applicable to individual professional services providers.

Data Analysis – After collecting all data from **502 respondents**, data are arranged / tabulated, analyzed and impact of external environmental factors is evaluated.

Findings – 502 views taken on scale is transformed into bar graph shown below-





Conclusion

It is found that there is a relationship between external environmental factors and individual delivering services and capacity to deliver services. The external environmental factors influence capacity of delivering services of an individual and hence the industry. The external environmental factors influence capacity of delivering services of an individual and hence the industry significantly.

Therefore capacity of system of operations delivering services is influenced by external environmental factors of the system, hence Capacity Management in Service Industry – Influenced by External Environmental Factors.

Suggestion – It is suggested that the External Environmental factors must be incorporated while computing the capacity of service delivery system of operations. The External Factors should not be ignored, and should be taken as priority factor in service sector.

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