

The Establishment of Measurement Model and Implementation Strategy for Service Productivity

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As a key factor of economic growth, productivity has been valued in the academic community. Today, with the rapid development of service industry, the research for service productivity has also attracted wide attention. However, in the service industry, because of its own characteristics and properties, measurement of service productivity could not apply for the traditional productivity measurement methods simply. This research first has put out the constitution model of service productivity, and thus put out the measurement model of service productivity. And explains that service productivity is a function which contains internal efficiency, external efficiency, and capacity efficiency. In service productivity, external efficiency is the key one, internal efficiency and capacity efficiency should also be given considerations. Eventually, the strategy of implementing the measurement of service productivity have been proposed.

Keywords: service, service productivity, constitution model, measurement model, the difficulty in measurement, the strategy of measurement implement

The Connotation of Service Productivity

Efficiency is a complex concept, which involves at least two parts: the internal efficiency and external efficiency. The former is related to the way of enterprises operations, labor and capital productivity, while the latter is a perception of the customers' business efficiency. The traditional concept of productivity is mentioned for specific tangible material goods manufacturers, and the existing productivity measurement model is more suitable for the manufacturing sector. In traditional manufacturing, measuring productivity is a relatively easy matter because quality constant hypothesis could be set up in the traditional manufacturing, and quality is a constant. Manufacturing is a closed system, which basically does not need to consider the external quality. Therefore, the traditional productivity measurement can simply use a specific kind's ratio of output and input to reflect the situation. If the ratio of the output and input increases after the application of resources or resource

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structure change in production, productivity would be increased.

While in the service sector, due to the existence of its own unique features, such as service is intangible, service is an open system, the consumption and production is carried out at the same time, customers need to be involved in the production process of the service, thus making quality constant hypothesis cannot be established in the service sector, which led to the traditional productivity measurement method does not apply in the service industry.

The definition of traditional productivity (also called narrow the definition of the productivity) considers only the inputs and outputs, which ignores the influence of quality for the transition process. This definition is not suitable to define service productivity obviously. Unlike traditional manufacturing industry, in the service kinds, quality is not a constant, and investment in the service process will affect the quality. Therefore, it is defined service productivity that service productivity is the efficiency that investment resources are converted into customer value during the process of service. The concept of service productivity should include the internal efficiency and external efficiency, and also include the capacity efficiency.

Proposal of the Model That Constitute the Service Productivity

Through the discussion of the concepts and theories about service productivity above, which is based on to propose the model of service productivity (see Figure 1).

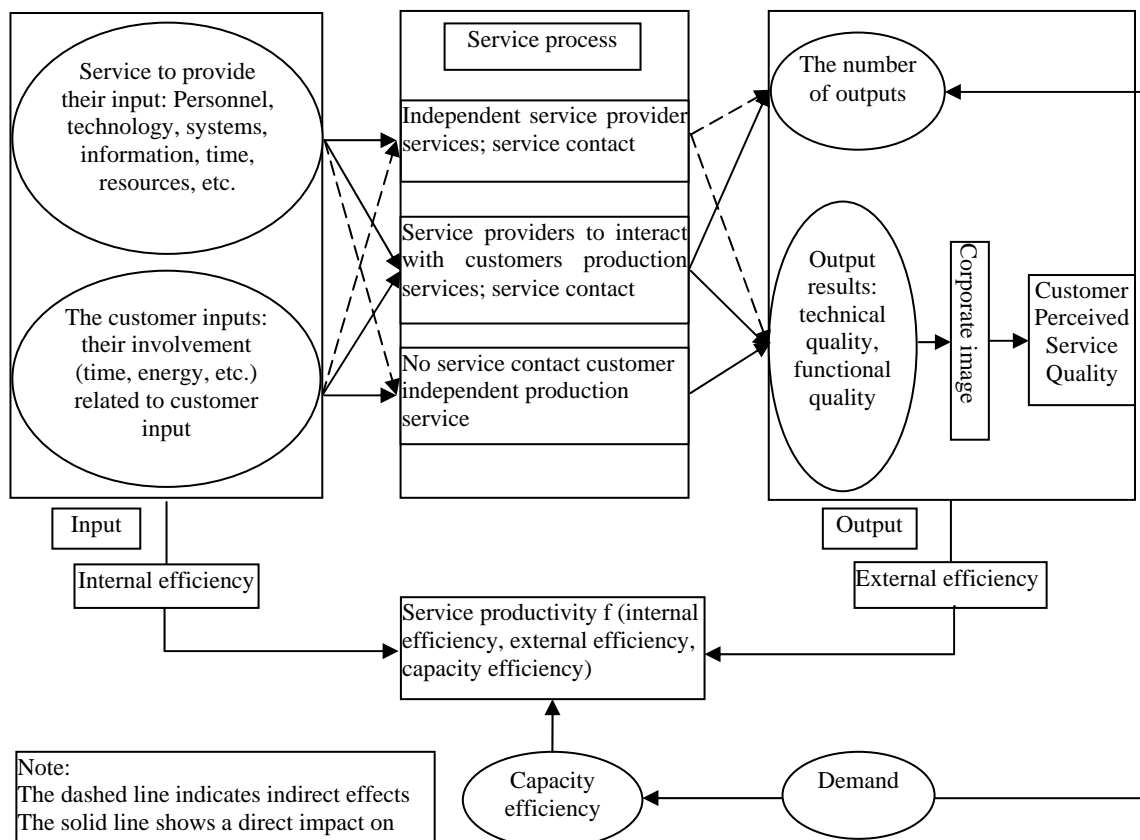


Figure 1. The model constituting service productivity.

From Figure 1, it can be seen that the service productivity consists of external efficiency, internal efficiency, and capacity efficiency. Among it, the internal efficiency includes the input of the service provider and customer input, while the input service provider includes employee attitudes, human, financial, material and so on, customer inputs include customer input, energy and psychological costs. The external efficiency includes the results of the output and the number of output, and the results of output is reflected through customer perceived service quality. The capacity efficiency is reflected during the conversion of the service production process—the service process. How to give full play to its service capabilities is a key factor to determine the final output quality for service providers in different degrees of contacting with customers. The number of output affects demand, and ultimately affects service productivity through capacity-efficiency, and internal and external efficiency converge through a series of service process.

Resolution of the Model Constituting the Service Productivity

The Internal Productivity

Internal efficiency includes the input of service provider and customer input.

Investment of service provider during the process of service—personnel, technology, information systems, time, resources, impact directly on the first two processes of service, and affect the third process indirectly. Customer input impacts directly on the second and third process, and affect indirectly the first process.

The more effectively service enterprises use their resources as an input for the service process, the better they will be able to educate or guide customers to take production service independently, so the higher the internal efficiency of the service process is. From the service provider's point of view, although the production service that customers take independently does not directly affect the internal efficiency, but it can play a decisive impact on service productivity through customer perceived service quality.

The External Efficiency

External efficiency, the output of services is also a two-way: the number of output and output quality.

The number of output is determined by demand. It is mainly affected by the second service process. If demand and supply are balanced, the capacity efficiency is optimized. If demand is greater than supply, capacity may be unable to meet demand, it will have a negative impact on customer to perceive service quality, resulting a lower external efficiency. If demand is less than supply, capacity has not been fully utilized, internal efficiency is lower.

The quality of output mainly reflected through customer perceived service quality. Functional quality during service process and technical quality of output, after the company's image filtering, form the customer perceived service quality finally. The higher perceived service quality is, the better the internal efficiency will be.

Capacity Efficiency

Capacity efficiency is the ability to manage demand, mainly reflected in the service process, how to better optimize the use of resources, in essence, it also belongs to the input, but it is investment to the management, more abstract, so here singled out.

In Figure 1, the process that covers internal efficiency and external efficiency is broken down into three separate processes:

- (1) Service provider independent production services (background operation);
- (2) Service providers and customer interactive production services;
- (3) Customer independent production service.

Service productivity, on the one hand, is the internal efficiency of resource utilization, on the other hand, is the external efficiency the resource utilization. In addition, the efficient use of resources (capacity efficiency) could make demand and supply have a positive impact on service productivity as much as possible. All in all, the high service productivity needs internal efficiency, external efficiency, and capacity efficiency of these three components to be optimized integrated together.

To Put Forward Service Productivity Measurement Model

The Principle of Establishing Service Productivity Measurement Model

Based on the foregoing exposition of the concept of service productivity, and the research of foreign service productivity measurement model, this paper proposes the following principles of establishing service productivity measurement model:

- (1) The measurement model established in this paper can reflect the nature of service productivity;
- (2) Measurement model elements need to be operable;
- (3) The model has broad applicability. When it is modified appropriately, it can still be used in different industries, enterprises or markets;
- (4) The possibility of accumulating impact must be taken into account the measurement model.

The Introduction of Measurement Mode

(1) Ismo (1998) proposed the concept of productivity, including the basic evaluation indicators in the service production operation: the number and quality of service products. Since the output of the service process is bidirectional: the number of outputs and output quality. He believes that the two should not be separated. Therefore, both the quantity and quality will constitute common shocks to total factor productivity of service industry, so about the measurement of service productivity, Ismo Vuorinen gave the following formula (1).

(2) ZHANG and LI (2008), Nankai University, proposed the following formula (2) service productivity measurement formula in 2008.

$$\text{service productivity} = \frac{\text{the quantity and quality of output}}{\text{the quantity and quality of input}} \quad (1)$$

$$\text{service productivity} = \frac{k_1 E_1 + k_2 E_2}{k_3 R_1 + k_4 R_2} \quad (2)$$

where E_1 is efficiency, E_2 is the benefits (effectiveness), R_1 is resource that enterprise invests in, R_2 is resource that customer invest in, k_1 to k_4 is modulus (weights). Efficiency is interpreted as the ratio of the expected resource and actual resource consumption, scilicet, is the effect of the use of resources, while effectiveness is the ratio of the actual output quality and the desired output quality that the enterprise and customer perceive.

The Proposed Service Productivity Measurement Model in this paper

Characteristics of the service sector itself is that—the output is bi-directional: the quantity and quality of the output, in addition, according to the previous discussion, the capacity efficiency in service productivity is a very important factor, although it is a kind of investment, it belongs to the management of investment, more inclined to

invisible, so during the process of service productivity measurement, you need to separate it out. In this paper, through the research of model of service productivity, service productivity should include the internal efficiency, external efficiency and capacity efficiency, and based on the inspiration of these two measurement formulas as well as productivity of the most original formula, this paper is made the following formula (3) service productivity measurement model, in order to provide a reference for the measurement of service productivity.

$$\text{service productivity} = \frac{k_1 Q_1 + k_2 Q_2}{k_3 R_1 + k_4 R_2 + k_5 A} \quad (3)$$

where Q_1 represents the quantity of output, Q_2 says the quality of output, R_1 says the customer inputs, and R_2 indicates the service provider's investment, A represents the efficiency of capacity, k_1 to k_5 is the weight (modulus) of corresponding elements.

In formula (3), Q_1 , Q_2 , represents the external efficiency also the output. R_1 , R_2 represents the internal efficiency, among them, R_2 is more biased in favor of the specific content, A represents the ability efficiency, and it is also a kind of management input, biased in favor of the invisible. The quantity and quality of the output should be considered from both businesses and consumers, which is the particularity of the service productivity concept.

The denominator mainly reflects the input, Including business and customer investment, among them, the investment of enterprise includes human, finance, material, information, and other resources invested by the enterprise for the provision of basic services, customer inputs include their input time, effort, and psychological costs during the process that customers to find and choose service providers. The ability of the efficiency of said inputs made in the management of supply and demand balance.

In fact, the service productivity itself is a relationship between output and input, and it does not deviate from the traditional productivity model, but during the time of service productivity measurement, it needs us to take into account the particularity to services.

The Notes of Service Productivity Measurement Model Application

(1) The unity of the units of measurement.

In formula (3), the quantity and quality in the molecules are two dimensions of the output, which cannot be added, so they need to deal with a unified unit of measurement, two indicators that can be additive. In this paper, the method is given: quantify them by scoring, and make them into two indicators that can be additive.

(2) Qualitative issues quantitative.

In formula (3), each one level indicator contains a number of secondary indicators, and it should make qualitative issues in the secondary indicator quantified, so as to be able to calculate.

(3) Allow a certain amount of subjective factors.

In formula (3), includes five weights (modulus). Although under the concept of service productivity, all the service sectors are the same, the various industries under the services sector have their own characteristics, and according to the specific circumstances of specific enterprises, allow the existence of a certain amount of subjective factors.

Implementation Strategy of the Service Productivity Measurement Model

Implementation of Internal Marketing Strategy

The level of service productivity depends largely on the level of the quality of staff, while highly qualified

staff should have good service skills, service attitude, and behavior. However, the direct purpose of internal marketing is to increase the service capacity of the staff, job satisfaction, and loyalty, thus is able to provide customers with high quality services and improve the external efficiency to create profits for enterprises. Internal marketing is the marketing concept introduced into the internal, considers that the companies only carry out actively marketing in-house firstly, then it can be better to service customer in external markets. It needs managers to regard employees as their customers, pay attention to staff needs (including physical and psychological), and communicate with employees, create a good service atmosphere for employees, and through a coordinated way to motivate employees to serve customers better. A complete internal marketing program should include the recruitment selection, training, motivation, communication, and retain.

Motivate and Guide Customers

Synchronization of production and consumption is a major feature of the service sector, which makes the customer more or less involved in the service production process. In the service industry, beginning with the customer to select the service providers until the end of a service, the customer almost always involved. If the customer is actively participating in the service production process, it means that the part of the work originally been done by the service staff is now completed by the customer because the enterprise takes actively marketing strategies to enable the customer to actively cooperate with in the service production process, which increases interaction between customers and service personnel and also can improve the efficiency of the service. So, people must discover more ways, in order to grasp the customer's information, through the use of the benefits arising from service delivery, to guide, motivate, and persuade customers to change their behavior.

Optimize the Structure of Supply and Demand, Improve the Efficiency of Capacity

Service output of the service sector cannot be stored, it is not like manufacturing, using warehouse to store production. So, in the service industry, once the demand fluctuations, such as a surge in demand, beyond the service ability of enterprise, then the customer need to queue, the waiting time is longer, which may reduce the quality of customer service. This is the contradiction between fluctuations in the demand and the relative stability of the enterprise service capabilities. The existence of this contradiction impact on service productivity seriously. Therefore, the service companies implement strategy from the two aspects of demand and supply. Firstly starting from the demand point of view, the strategies generally adopted by are: (1) pricing differentiation; (2) booking and reservation system; and (3) facilities management. While on the supply side, there are following strategies: (1) to guide and encourage customers to use more self-service; (2) to employ part-time employees or hourly workers; and (3) implementation of the service process reengineering. Simplify the way of service delivery, in order to indirectly increase the supply of services.

Conclusions

This research has analysed the difficulties that existed in the measurement of service productivity. And also it has figured out the constitution elements of service productivity, pointing out that service productivity is consisted of external efficiency, internal efficiency, and capability efficiency, on which the measurement of service productivity has basis. Eventually, the strategies and measures of implementing service productivity measurement have been proposed from the aspects of implementing internal marketing strategy, motivating and

inducing clients, optimize structure of supply and demand, improving capability efficiency.

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