A Service Design Framework for Manufacturing Enterprises toward Product Service System

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Abstract. Manufacturing enterprises have been recently trying to create new value through a strategic alternative such as Product Service System because of the limitation of product growth, the keen competition of price and so on. Manufacturing enterprises have many risks to extend their business field over their core ability, with not enough the service domain knowledge, human resources and investment costs. This study suggested the framework that is needed for manufacturing enterprises to penetrate into a service business domain.

Keywords: service design, service framework, product service system.

1 Introduction

Manufacturing companies are creating a considerable portion of the added value on entire business from service, and the paradigm is changing into providing service rather than providing products. The Product Service System was introduced due to the factors of growth limit of manufacturing business, intensified price competition, and sudden rise of the late-starting nations of low production cost, including China. Due to such factors, the necessity of differentiating with a single solution of combined product and service is being magnified when providing a single product. This study intends to suggest a framework providing a strategic plan that can be selected in each step of the entire service process when manufacturing businesses are trying to carry forward a Product Service System when they are not equipped with core competence of the service business.

2 Service Design Framework

Manufacturing firms face strategic, developmental, and operational difficulties when they try to deliver differentiated value to customers through service and to secure competitive advantage. For manufacturing firms to penetrate the service market with limited resources and a limitation of so-called lack of capacity in the service business, they need to take full advantage of the external resources and capacities. There are 3 strategies that can be taken into an action in the service process for successful service management of the manufacturing firm, and they are Open Innovation, Outsourcing, and Internalization. Whereas securing various ideas, knowledge, and technology is

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possible for Open Innovation, the project management cost is high. The outsourcing promotes productivity and improves efficiency of a project by giving out functions that the manufacturing firm cannot carry out and can cut down the cost. Lastly, the advantage of internalization is in how manufacturing business can develop core ability of the service business, however, there is also a disadvantage that it takes a lot of resources to learn the capacity. As explained, each method has advantages and disadvantages. Manufacturing firms need to bear these advantages and disadvantages in mind when carrying their business forward by putting different importance on the 3 plans by each stage of the service process.

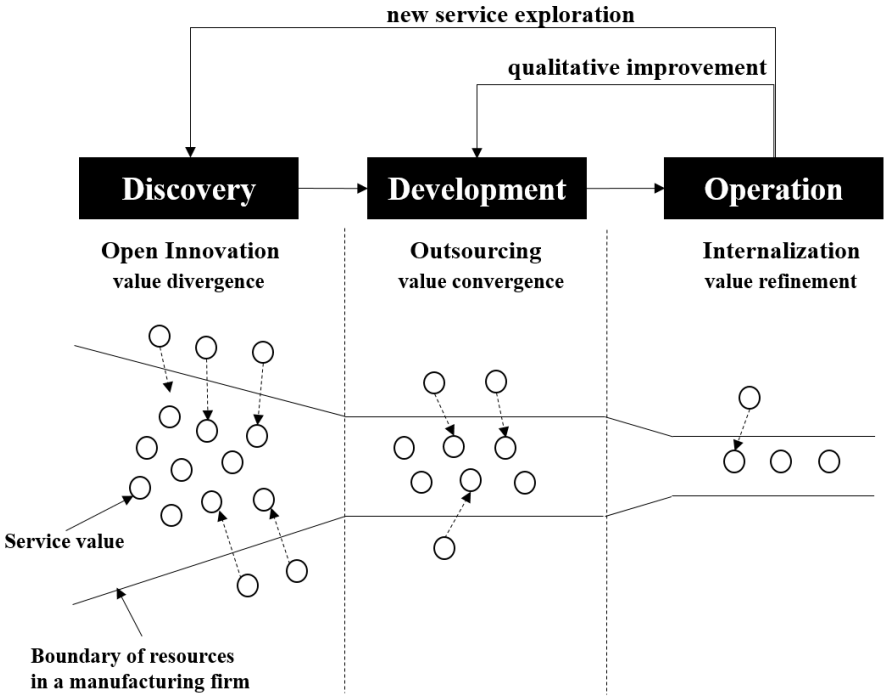

Fig. 1. A service design framework for manufacturing firms

2.1 Discovery Stage

For manufacturing firms to do service business of different domain from the existing manufacturing business, they need to establish a core value of the service first. It is because the absence of service value becomes the biggest obstacle when creating a new business. For this reason, collecting various ideas and knowledge seems appropriate at this stage by covering open innovation in depth. Specially, it is worth noting the crowd sourcing because various ideas and knowledge can be collected from many people at low cost. It would be necessary for the manufacturing business to distinctly establish value that the service intends to deliver to customers by linking

their capacity that they accumulated in the existing manufacturing field based on such collected idea and knowledge.

2.2 Development Stage

It seems appropriate to approach the absence of competency for service development of manufacturing businesses through outsourcing. It is because establishing the internal service development organization and inputting human and material resources are very risky at wasting the cost. The entire service value for customers will be developed into the outsourcing form in a distinct way by dividing into sub values. This will not just improve the productivity and efficiency, but can also promote the cost reduction.

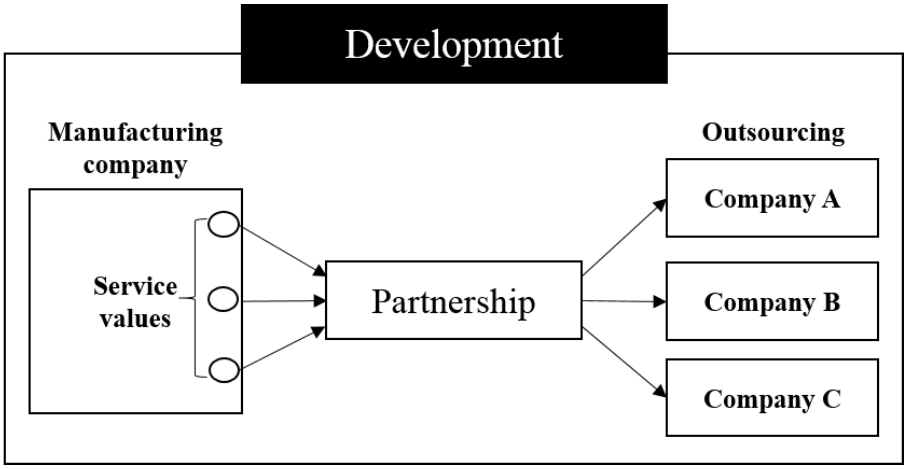

Fig. 2. Make partnerships among outsourcing companies

2.3 Operation Stage

The key point in service management is the service operation. Appropriate measure can also be developed rapidly because customer responses (satisfaction or dissatisfaction) that occur in the service encounter can be noticed quickly. Also, consistently improving the service quality through service operation can be expected as well. For a successful service operation, the organization capacity of various support organizations related to the customer relationship management and service operation acquires a great importance. Because manufacturing businesses do not have know-how's regarding the service operation at young stage of the service business, they can start trust management by sharing necessary systematic functions in the service operation in the outsourcing form with other businesses. However, as core competence in the service business is an empirical knowledge which is learned by operating the business, it seems necessary for manufacturing firms to internalize systematic functions regarding the service operation that were put on the outsourcing. In other words, it

seems appropriate for the outsourcing to approach from the early service release and short operation perspective. In the end, learned empirical knowledge from the service operation will find new service business or will work as the driving force that can expect quality improvement of the newly released service.

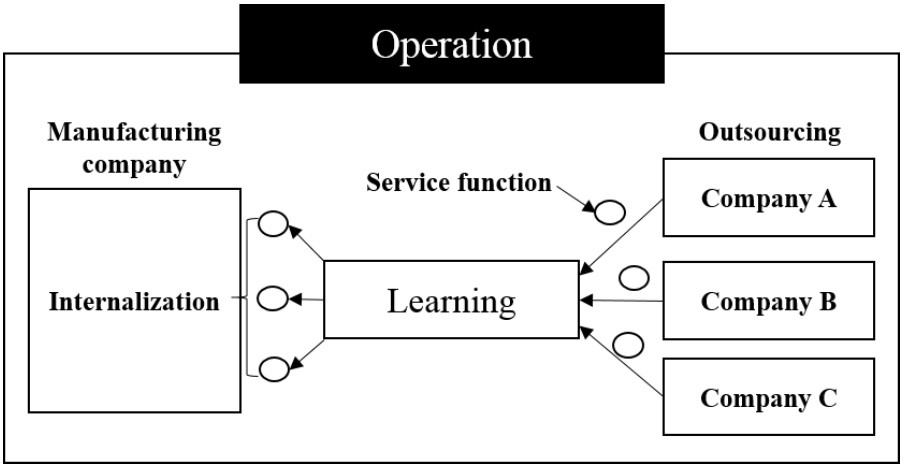

Fig. 3. Make learning process to internalize the operational ability

3 Conclusion

This study suggested a framework of an effective service management that can overcome relatively insufficient competencies in the service business compare to the manufacturing industry for manufacturing businesses to accomplish the product service system. The framework includes applicable strategic measures (open innovation, outsourcing, and internalization) in each stage of the service process, such as discovery, development, and operation. In future studies, the workers who are in charge of carrying forward the product service system in actual manufacturing firms will be interviewed to verify validity of the framework.

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