Chapter 15
An Analysis of Knowledge Space Concept and Recursive Approach for Servitizing in Manufacturing Industries

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ABSTRACT

This chapter proposes a knowledge space concept and a recursive approach to servitizing in the manufacturing industry. Manufacturing companies need to move up the value chain and compete on the basis of value delivered rather than on the basis of typical products. Therefore, more corporations are adding value to their core corporate offerings through services, which is called servitization, and the strength of service activities within the manufacturing industry (servitization) has become the main source of competitive advantage. This chapter identifies two exclusive approaches to adapting servitization in the manufacturing industry called the knowledge space concept and recursive approach, which also explains the value co-creation process with customers through integrating "B-to-B to C," which produces a company that is a value provider.

1. INTRODUCTION

The importance of service has been focused in various areas in the 21st century. Service is an economic activity that creates value and provides benefits for a customer at specific times and places by bringing about a desired change in, or on behalf of, the recipient of the service (Lovelock and Writez, 2004). It is also the application of specialized competences (knowledge and skill) through deeds, processes, and performances for the benefit of another entity or the entity itself (Vargo and Lusch, 2004). From this statement, individuals can get clear perspective of trade and

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industry phenomena. Value is co-created through the mutual effort of firms, employees, customers, stakeholders, government agencies, and other entities related to any given exchange (Vargo, Paul, Maglio and Melissa, 2008). Therefore, the interaction between customer and service provider is important (Uchihira, Kyoya, Kim, Maeda and Ozawal, 2007) to designing service value and for moving to value chain perspective.

The value chain concept was first introduced by Vandermerwe and Rada (1988) where they specified that the more corporations are adding value to their core corporate offerings through services that referred to it as "servitization" in business. Servitization defined as the strength of service activities within the manufacturing industry, has become a main source of value creation for gaining competitive advantages. Organizations such as Siemens, IBM and GE have been performing as value providers by adding services to their product since 1990s (Quinn, Thomas and Penny, 1990). The developed economies have almost shifted their market share from manufacturing to more product-service-oriented through value delivering system (Baines, Lightfoot, Evans, and Neely, 2007; Neely, 2008). This means that manufacturers are to recognize the strategic integration of services as a source of move to value-chain vision (Oliva and Kallenberg, 2003).

However, the shift from a product-centric vision to value-chain vision is still poorly understood and remains new and complex issues (Miller, Hope, Eisengstat, Foote and Galbraith, 2002; Voss, 2005). The organization has to diagnose the customer value and keep in with value co-creation process, which leads to improvements in the organizational knowledge creation procedure. The "knowledge space,." stands for a set of all knowledge from companies, customers, and users (Belal, Shirahada and Kosaka, 2012), that is full of with capability for producing recipients required solution. However, before fabricating the solution an organization needs to recognize the precise expectations of recipients. The "recursive approach" (Belal, Shirahada and Kosaka, 2013) based on Japanese Omotenashi service can perform an active role to discover a concrete prospect of recipients recursively through the analysis of gap between organizational expected response and customers' true response. Then, the designed solution must create value with recipients. Thus, the knowledge space concept and the recursive approach are serviceable for value co-creation in the manufacturing industry as well as respectable for managing successful servitization.

Therefore, this chapter aims to present two exclusive approaches, the knowledge space concept and the recursive approach, to adapt servitization in manufacturing industries. In section 2, we review the literature on servitization in the manufacturing industry. Section 3 describes the concept of knowledge space and a collaboration model for servitization in the manufacturing industry and two cases are analyzed for showing the effectiveness of knowledge space concept in Section 4. Section 5 proposes a recursive approach for finding new services, and two cases of recursive approach are shown in Section 6. Final section concludes the chapter with a summary.

2. LITERATURE REVIEW ON SERVITIZATION IN MANUFACTURING INDUSTRY

Manufacturing companies only concentrated on producing typical goods or focused on very little maintenance services, but in recent year the companies have realized the importance of differentiation for market sustainability and moved toward service-orientation as an opportunity to increase differentiation (Martin, David and Horne, 1999). Neely (2007) also stated that currently pure manufacturing firms cannot compete on the basis of cost. Consumers request for a value-creating process with a product (e.g., training, know-how, support, information, maintenance etc.), and they do not require the typical product itself (e.g., a