

Chapter 11

Dynamic Service Matchmaking Model and Algorithm

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ABSTRACT

In the service industry, individual customer service requirements are different from the market demands. The requirements determined by the market demand are called static requirements, and those determined by individual customers in specific service processes are dynamic requirements. The service system is constructed according to the static requirements, to meet the market demand, and then, in each service process, the service system must combine its capabilities with the dynamic requirements of the specified customer to provide customized services. Using the dynamic requirements as input, the service system realizes its value in co-creation with the customers more efficiently. Dynamic service matchmaking is the process of matching the dynamic requirements of a specific customer to the service system's capabilities, giving the most suitable service recommendation or customization. By using the theory of Ontology, the authors present a dynamic requirement description model. In this model, they first decompose services and requirements into sub-items. They then map these items to requirement ontology trees to calculate the similarity between service and requirement items. Finally, the authors calculate the weighted average of those similarities as the result of matchmaking. A dynamic service matchmaking problem is presented as an example for further explanation. The multi-stage dynamic matchmaking model takes this issue for a more complex situation and tries to compose a service bundle for a series of dynamic requirements.

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1. INTRODUCTION

Traditional product-based marketing and micro-economics have been focusing on studying market demands, product design, manufacturing, and the sales process. As competition intensified, they began to pay more attention to the market segments, and to increase the flexibility of the production system to respond to the needs of more varieties of requirements (Vargo & Lusch, 2008). Because the market is the main concern in these theories, no matter the level of subdivision, the objectives still are to strive for providing physical products, meet “the market demand” and not to respond to “the individual needs of specific customers.”

Service science starts from studying “individual customer needs” and uses customer requirement information as the key input in the service process. Customers are participants in the collaborative service process and work as co-producers with service providers (Spohrer, 2007).

Service Science also focuses on the procedure of value co-creation Service-dominant (S-D) Logic (Vargo & Lusch, 2004) and The Unified Service Theory both emphasize the value co-creation feature of service in the social production and consumption collaboration process. This leads to a conclusion that the collaborative model of service is easier to use in connection with the expertise of participants, so that the service-based collaboration is more efficient than the product-based collaboration (Wangshuliang, 2009). As a result, more and more traditional production enterprises have partially, even totally, transformed their physical products into services, for a high level of customization and customer satisfaction.

This transition requires that we re-examine requirement in modern service theories and study its different features from the traditional market demand based on physical product characteristics. This is done in order to realize better design of the service system, and provide dynamic, personalized service.

In this chapter, first, we divide the requirement of service into static and dynamic requirements, corresponding to the market demands and the individual customer requirements, and then analyze their differences and relations in detail. Secondly, we introduce a dynamic requirement description model based on the ontology theory, trying to decompose requirements and services in a standard way. Thirdly, we present an algorithm system of matchmaking between requirements and services, which can recommend suitable services for a given customer’s requirements based on mathematical calculations. Using this, an example of service matchmaking is given in section five. Finally, we discuss the multi-stage dynamic service matchmaking problem in section six.

2. THE DYNAMIC AND STATIC REQUIREMENT

The Market Demand and the Individual Requirement

The assumptions of Goods Dominant (G-D) Logic or the Goods-Centered View were that the goals of economic activity are to manufacture and sell products; the standardized production processes are built for efficiency and production control; products can be stored for future sale when more profit is available. On the contrary, Service Dominant (S-D) Logic or the Service-Centered View’s assumptions were that economic entities use their core competitiveness for the benefit of other entities and their specific requirements. The service production and consumption occur simultaneously, and services cannot be stored (Vargo & Lusch, 2004).

The key distinction of these two views is the difference of the target object. The Good-Centered View’s target object is products, and the Service-Centered View’s target object is the abilities of value creation. The former stores value in products and the latter uses their abilities col-

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