SERVICE SUPPLY CHAIN: AN INTEGRATED CONCEPTUAL FRAMEWORK

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ABSTRACT

It is necessary to integrate, coordinate and collaborate the different service operations performed in various organizations in order to deliver the services at the highest level of customer satisfaction. This integration can be done through a service supply chain, which includes different players/organizations connected by a network of activities. Based on literature review on Service Supply Chain, structure, decisions as well as the application area of service supply chain are highlighted in this paper. Service supply chain is then linked with key service operations with the help of a proposed conceptual framework. The paper also highlights the important research directions which can be a part of service supply chain. This paper is an attempt to conceptualize a service supply chain through a framework which helps in visualizing the integrated service network.

Keywords: supply chain management, service supply chain, service operations
1 INTRODUCTION

A critical part of any organization’s endeavour to compete in today’s market is the design of their supply and distribution networks. This is true not only for product companies, but also for service companies [1]. The service economy has always been the driving force of economic growth of every developed nation [2]. The concept of supply chain management has been applied in manufacturing sector by various researchers and the results obtained are found to be very fruitful in terms of cost optimization and increased quality level. Service operations have unique characteristics that are not found in manufacturing [3]. In fact, similar to the production of manufacturing goods, services production involves the collaboration of several actors; the service providers, the suppliers of other services or resources needed for the design and delivery of these services and the service clients, all working together to co-produce value in complex value chains or networks. But due to certain differences in manufacturing and services [1], there are inherent difficulties in developing standard models for services due to the peculiarities of service exchanges which also contributed to the dearth of research in the area [4].

Services are considered as supply chain processes that are balanced around the capacity of the firm through the upstream sourcing processes [2]. Various reasons why services can be viewed as a part of supply chains [2] are coordination of processes, improved performance through process integration, and improvement of the customer interface. It is necessary to integrate, coordinate and collaborate the different service operations performed in various organizations in order to deliver the services at the highest level of customer satisfaction. This integration can be done through a service supply chain (SSC), which includes different players/organizations connected by a network of activities. A SSC can be described as a network of service provider facilities, each of which is capable to process one or more service tasks on an as needed basis [5]. Two key characteristics of a SSC are i) the business service is decomposable into several sequential tasks that can be processed by different service providers, and ii) the primary capacity resource is skilled labor, and there is no inventory and material flow in SSC.

All the decisions in any SSC chain can be categorized in three levels depending on the timeframe and the effect. Level-one decisions are in the area of service business planning, and they have a long term effect on the SSC. Examples of level-one decisions are dynamic sourcing, service provider selection, capacity planning, service delivery, service quality, service productivity etc. Level-two decisions are in the area of tactical planning, and they have a shorter life than level-one decisions. Examples of level-two decision are capacity planning, effectiveness in scheduling, supplier cost and pricing issues, forecasting accuracy etc. Level-three decisions are in the area of operational planning and scheduling. The effect of these decisions is short term and they are constrained by level-one and level-two decisions. Examples are staff scheduling, short term forecasting, resource allocation, the service order entry method, the customer service order path, capacity utilization, operating ratio of actual to planned working hours, etc.

Based on the current research trend in SSC management, a theoretical understanding is developed and hence an integrated conceptual framework is proposed in this paper. The proposed framework highlights the structure, decisions and operations that are carried out in a typical SSC. The proposed framework will provide an aid to service operations managers to take vital decisions in building up the service package in an efficient and cost effective manner. This will ultimately result in the timely delivery of the services to the customer and enhancing the level of customer satisfaction.

2. LITERATURE REVIEW

In this section, literature review is performed from the area of SSC management. The review starts with different definitions on SSC addressed in the literature. The definitions are
followed by the literature dealing with the structure of SSC. Finally, the area of application of SSC has been summarized.

2.1 Service Supply Chain Definitions

SSC has been researched and defined by various authors and subsequently applied to various service sectors. Table 1 summarizes the SSC definitions given by different authors.

2.2 Structure of SSC

The structure of SSC has some similarities with the product supply chain, as the services are created, purchased and transferred from one element to another in a form of a chain. The structure of SSC is a complex network, which combines direct or indirect service providers around service integrator [12]. The initial contribution was from [26], a SSC consists of a customer, a service provider and an initial service provider. The author also mentioned the bidirectional nature of SSCs. A social capital link was introduced between customer and service provider as well as service provider and service supplier [13]. Based on the delivery of the different forms of services, the structure of SSC can be divided into three forms: serial-SSC, parallel SSC and hybrid SSC [9]. Demirkan et al. [14] structured an application SSC with three members that are application infrastructure provider, application service provider and customer.

Peng et al. [15] discussed the structure of third party payment services, which include three basic structural elements that are ebanks, third party payment companies and e-commerce websites. In an education supply chain [16], the members are suppliers (education and research suppliers), service provider (universities) and customers (education customers and research customers). Tourists, tour operators and service suppliers constitute a complete tourism supply chain and patients, health-care centres and relevant suppliers constitute health-care supply chain [10]. Three roles in a human resource (HR) SSC are consultants, administrative service providers and technology enablers.

SSC’s basic architecture is professional service provider, service integrator, the final consumer, and the chain members participate in the entire process of service [17 and 11]. Song et al. [12] analyzed the producer services and structured their supply chain with three basic elements which are: the direct services contractor at the core; the indirect services provider and the services demander as the node enterprises.

A typical SSC consists of three basic structural elements that are customer, service integrator and service provider. As services are intangibles, there is no material flow between these elements; in fact they are connected with information only.

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<th>AUTHOR</th>
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<td>Kathawala et al. [6]</td>
<td>The supply chain management for the service industry is the ability of the company/firm to get closer to the customer by improving its supply chain channels. The SSCs will include responsiveness, efficiency, and controlling</td>
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<td>Ellram et al. [7]</td>
<td>Supply chain management is the management of information, processes, capacity, service performance and funds from the earliest supplier to the ultimate customer.</td>
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<td>Baltacioglu et al. [8]</td>
<td>The SSC is the network of suppliers, service providers, consumers and other supporting units that performs the functions of transaction of resources required to produce services; transformation of these resources into supporting and core services; and the delivery of these services to customers.</td>
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Baltacioglu et al. [8] | SSC management is the management of information, processes, resources and service performances from the earliest supplier to the ultimate customer.
Li et al. [9] | SSC is a service-network that reorganizes different service entities in order to satisfy customers’ require by using modern management technology to break down and rebuild a system which considers customers’ demands as starting point and takes a complex service or an Integrated Service Package as a series of process in service when the service-industries are developed to some extent.
Wu et al. [10] | SSC can be defined as follows: an integration of a series of entities (individual person, organization, enterprise) to provide personalized service directly or indirectly.
He et al. [11] | SSC refers to the supply and demand chain of service which integrates the service resources using new technologies and management models.
Song et al. [12] | The Producer SSC management is an integrated management mode of service information, service processes, service capacity, service performance and service funds from the initial service supplier to the ultimate customer in the process of producer service outsourcing.

2.3 Previous Work On SSC

The knowledge of the structure of supply chains in service businesses is still scant [8] and the concept and application of SSC is in its inception. Very few researchers have made an attempt in understanding and building of supply chains of services, through the adaptation of existing SCM models [7, 1 and 8]. Studies so far focused on how traditional supply chain functions can be defined in services [6] and [19] and investigated the dyadic relationship between the service provider and the end consumer of a service [18].

![Figure1: Service Supply Chain (Source: Baltacioglu et al. [8])](image)
Customers are the suppliers in a SSC, the inputs from the customer sides are considered as the supplies [18]. In an attempt to develop a service SCM framework, [19] assessed the utility existing SCM models and have adapted six processes of the global supply chain forum framework [20] for application to a SSC: information flow, capacity and skills management, demand management, customer relationship management, supplier relationship management, service delivery management, and cash flow. Since the beginning of SSC concept, various researches have been carried out in different service sectors. Lee et al. [21] used the structural equation models to study the relationships among internal service quality, employee satisfaction, employee loyalty, external service quality, and customer satisfaction. Li et al. [9] discussed the different attributes of a SSC, like Object attribute, Structure attribute, Dynamic attribute, and Operation attribute. Social capital has a positive impact on SSC performance; moreover it is found that this impact is greater on pure services supply chain in comparison to other service structures. The small service industries seem to have benefited by the social capital [13].

2.4 Application Area Of SSC

From the literature of SSC, few of the application area of SSC are highlighted in Table 2. It is thus observed from the literature the wide applicability of SSC management in different service organizations.

As discussed earlier, service organizations have been studied and analyzed from different viewpoints by different authors. A SSC is a network of different service organizations, which operates independently as well as in collaborations. Each organization handles its service operations like demand management, capacity management, forecasting etc. Figure 2 shows few of the key service operations that have been studied in the past.

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<td>Logistics</td>
<td>[9, 12, 28, 29, 17, 10]</td>
<td>Application Services</td>
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<td>Education</td>
<td>[16]</td>
<td>Others</td>
<td>[17]; [11]; [10]; [15]; [21]</td>
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3. INTEGRATED CONCEPTUAL FRAMEWORK

It has been observed from the literature that there is a need to link different service operations in a SSC with an aim to deliver the required service to the customer. It is essential to understand the activities performed at various stages of SSC. In order to build this link between SSC and service operations, an integrated conceptual framework is proposed.

3.1 Link Between Service Supply Chain And Service Operations

After going through the history of SSC and understanding the key service operation issues in a service organization, an integrated conceptual framework is proposed which integrates the structure and decisions to form a SSC. The proposed framework highlights the structure of the SSC which has been discussed earlier in literature review section with three basic elements that are customers, service integrator as a core and service providers. The structure obtained from the literature is modified in this framework by adding various service operations and decisions that are required at different levels of a SSC. The proposed framework clearly explains the flow of key activities that are carried out in a typical SSC.

The various steps involved in the whole process of service delivery can be understood with the help of developed framework. It shows that in a SSC, there can be a number of customers, each of their individual service demands are forwarded to the service integrator. The service integrator here is considered as the core element of the SSC. Service integrator is responsible for managing customer demand, through its demand management capability. Next stage is managing the capacity to perform service operations and ultimately delivery of service to the customers. If the integrator lacks service capacity, as in most cases, the responsibility of the integrator is to manage its capacity. Capacity management can be done by selecting service providers who are capable of performing the required service tasks. These service operations can also be outsourced to different service provider using various service outsourcing strategies.
After the service providers perform their operations and come up with service solutions, these services need to be integrated and customized depending upon the customer requirements. This task is again accomplished by the service integrator. Finally, the customised service package is delivered to the final customer through a well managed service delivery system, which is again the core activity of the service integrator. It is imperative to integrate and coordinate various activities in order to deliver the services to the customer at the requisite time, in an efficient and cost effective manner and also maintaining the flexibility for any sought of variability.

3.2 Research Directions

It is worth mentioning that the research in the area of SSC is still in its early stage. So, there is a need to address the various research directions that can be a part of SSC of an organization. Based on the literature on service operations, SSC, service marketing management and supply chain management, some of the key research directions that can be
highlighted here are service demand forecasting, service provider selection, service outsourcing, cooperation and collaboration between players, demand and capacity management in services, service customization, service delivery systems, service quality and performance measurement etc.

4. CONCLUSION AND FUTURE SCOPE

This paper provides insights into the conceptualization of the service supply chain management (SSCM) field. The SSC is a structured chain which is needed to be managed with supply chain principles in order to produce and deliver services at competitive level. The work enables us to briefly describe SSCM, suggest how it should be described and structured and also highlights the various decisions that are needed to produce and deliver the services to the customer through a SSC network. The work provides a conceptual model of SSC, which discuss the core elements of SSC as well as the various key operations carried out in the service flow through a well managed SSC. This generic model can fit to different service industries, and also provides the vision to the service operation managers to carry out their service activities in a systematic and planned manner to achieve organizational objectives. However, the study is based on general theory and lacks the support of real life case studies with actual data which can truly relate to the structure and decisions highlighted in the framework. So, this study can be extended by incorporating the proposed framework in different service industries and relating the structures and decisions of their SSCs with the proposed framework. At the same time, the role of different structural elements and the impact of various decisions on the performance of the chain can also be studied in future.

REFERENCES


