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The struggle of multiple supply chain structures: Theoretical overview

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Abstract

Supplier firms are integrating downstream closer to the construction client. Sawmills have tried for decades to start producing timber buildings in order to capitalise on their core product; sawn timber. Their efforts have often failed, which is attributed to the different business logics between sawing timber and constructing buildings. This research identifies the supply chain structure as an important classification of production and business logic. Many firms operate make-to-stock, make-to-order and even engineer-to-order within the same firm, thus utilising the same or overlapping resources. From a theoretical viewpoint, this paper explores the problem of multiplicity in supply chains within construction and construction supplier firms. Literature on operations strategies, operations management, and supply chain structures is covered and put into perspective. It is an important capability to handle diversity in supply chain structures, not only when expanding business, but also in balancing different product categories internally e.g. to handle variations in market demand. The effect on internal resource utilisation can be vast. Operations management must take the differences in supply chain structures into account when developing key performance indicators and operations management strategies.

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Keywords: ETO; MTO; production strategy; supply chain structur; operations management

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1. Introduction

Sawmills have tried to find ways to increase the value of their main product, sawn timber, by climbing the added value chain ladder. The changes in market demand, price and the fact that customers are demanding highly customized products, Köber & Heinecke (2012), has driven them to move closer to the end users and customers, by starting to produce timber buildings. This means changing their operational strategy. The same is happening in the food processing industries, with a growing variety in products, an intense competition and a growing focus on customer needs, Van Donk (2001).

It seems that a new phenomenon in construction is the movement of companies towards diversity in supply chain structures by expanding their product portfolio thereby strengthening their market position i.e. operating both on ETO and MTS basis.

But the change from high volume, high standardization, low variety and largely predictable operations i.e.Make-to-stock (MTS) with no significant risks, to operations with high levels of product variety, product customization, low predictability, and significantly higher risks and costs i.e.Engineer-to-order (ETO), MacCarthy & Brabazon (2008), Olhager (2012), has often failed. This is due to differences in supply chains, manufacturing strategy, and business logics. One possibility is to first adapt Make-to-order (MTO) production strategy where everything is pre-designed and the manufacturing of the product starts once the customer places the order. This strategy is widely used in the automotive industry by such companies as Scania.

All literature is reflected toward my own experience in the field of sawmill operations and constructions operations as I have worked in several managing positions in sawmills and construction companies for approx. ten years. I am seeking to get a correct explanation for the phenomena that I have experienced in the wood industry. The aim is to get a picture of the challenges in multiple supply chain structures and to understand what is needed when moving to a different supply chain.

2. Method

In this research the characteristics of MTO and ETO supply chain structures will be broken down and problems when a company moves from one production strategy to another are exemplified. The overall aim is to provide a framework to understand the differences in operations management in MTS, MTO and ETO. Slack´s (2013) three core functions were followed and mirror against supply chain structure. Systematical review of literature related to operations management, operations strategy, supply chain management and supply chain strategy was done using ETO, MTO, production strategy, supply chain structure, operations management in the keyword search. The identifications of papers was a result of a “snowball effect”, when references were reviewed. A number of over fifty papers and books were read. The papers that we included were picked for their contribution to the aim; what is the theoretical framework capturing ETO and MTO supply chain structures in one company?

The first author of this paper have a deep understanding and experience from both sawmill operations and construction operations, therefore mirroring the authors experience from the field toward the theory and seeking explanations for the phenomena is a viable method. The author is a full time employee at a big international timber company that has just started to move towards the customer in the construction supply chain by offering more than just sawn timber. The author is in a unique situation to study what is happening inside a big international company when it moves from one supply chain to another.

3. Operations management

According to Slack et al. (2013) all organizations have some kind of operations function because every organization creates some kind of product or service. To satisfy customer needs, operations use their resources and processes to transform inputs into outputs. Slack suggests that there are three core functions in any organization; the marketing (including sales) function, the product/service development function, and the operations function. Operations managers need to co-operate with other functions to ensure effective organizational performance.