

Improved TOC for outsourcing decision

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Abstract. The aim of this paper is to develop and demonstrate a theory of constraints (TOC) model that utilizes TOPSIS method in estimating the priority of each product in a multiproduct constraint resource environment. The decision model compares four alternatives: Standard cost accounting, Standard Theory-Of-Constraints (TOC), LP analysis and our own solution. The numerical results show that the proposed approach is superior to standard cost accounting and theory of constraints and presents a more realistic state of optimum allocation of resources and measures the performance of the model. This research is limited to the production process where there is no multiple constraints.

Keywords: standard cost accounting, standard theory-of-constraints, topsis, linear programming, outsourcing

1 Introduction

Production outsourcing decision is the outcome of constraint resource analysis. Such situations are characterized by market demand in excess of company's production capacity. This article analyses the case where market demand exceeds company's capacity to manufacture. Decision maker needs to decide what quantities of each product to manufacture and what quantities to buy from external contractors.

Since different models provide radically different answers to the outsourcing problem we compare four alternatives: Standard cost accounting, standard Theory-Of-Constraints (TOC)^[11, 30], Linear Programming and our TOC/TOPSIS model.

Many researchers explained the difficulties of Standard accounting procedure^[16, 24]. One research stream has stressed on throughput accounting^[9, 11, 36, 37]. Another research stream worked on TOC with traditional cost accounting and activity based cost management^[3, 17]. One group of researchers^[35] focused on software optimized production technology (OPT). Of the new management philosophies established in recent decades, the Theory of Constraints (TOC), which was developed by Goldratt at the beginning of 1980s, plays a vital role. Its main purpose is to identify, analyze and eliminate those constraint that restricts a firm's value adding process^[12]. As a tool for product mix decisions, the Theory of Constraint (TOC)^[19] based approach is often used alternatively (or parallel) to optimization tools, such as the contribution margin per constraint unit method or linear programming (LP) approaches. The present work explains how using a combined TOPSIS/TOC model authors were able to determine the product throughput of the manufacturing firm and discuss the justification of the proposed model.

It is the aim of this paper to compare a Standard Theory-Of-Constraints based hybrid model with other model and provide more insight into the constraint resources by analyzing the main premises of the product mix decision.

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