



UNIVERSITI PUTRA MALAYSIA

**SUPPLY CHAIN AND OUTSOURCING PRACTICES IN THE FOOD PROCESSING
INDUSTRY**

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**SUPPLY CHAIN AND OUTSOURCING PRACTICES IN THE FOOD
PROCESSING INDUSTRY**

By

AHMED ALI AL-SHAHRI

**Thesis Submitted to School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for Degree of Doctor of Philosophy**

November 2008



DEDICATION

To each and every single member of my family for their never-ending encouragement and support. A special dedication goes to my beloved parents, who made countless sacrifices to see me and my brothers and sisters make the better of our lives.



Abstract of the thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for degree of Doctor of Philosophy

**SUPPLY CHAIN AND OUTSOURCING PRACTICES IN THE FOOD
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Faculty: Engineering

The Malaysian food processing industry has been experiencing a major transformation, driven by the emergence of large retail chains and the changing consumption patterns and lifestyles. However, no empirical studies have been conducted to investigate the attempts undertaken by companies in the industry in taking advantage of supply chain management and outsourcing applications. Moreover, a critical review of outsourcing models from literature showed that the majority of the models developed were ambiguous, assumed outsourcing is only limited to non-core functions and lack a clear-cut decision making methodology. Also, none of the examined models was developed specifically for the food processing industry.

Therefore, this research aims to provide a detailed analysis of the outsourcing and the supply chain activities in the Malaysian Food processing industry and develop a model

for outsourcing decision making in the food processing industry that will allow companies to decide their outsourcing policy for any intended outsourcing project.

Data for this research were collected through literature review, expert interviews, and survey questionnaire. The survey questionnaire was used to gather empirical data on outsourcing and supply chain management issues in the Malaysian food processing industry. Five hundred questionnaires were mailed to randomly chosen companies in a 5-month period that yielded a response rate of 11%. The outsourcing decision making model was developed using the Analytical Hierarchical Process (AHP), and validated by conducting structured interviews with 25 purchasing managers from different food processing companies and analyzed using the Expert Choice Software (v. 9.5).

The results indicated that modern SCM principles have not penetrated well into the Malaysian food processing sector. Only 44% of the respondents have strategic partnership(s), and 39% indicated an increase in strategic partnerships(s) in the last three years. Companies outsource both core and non-core function. The top five outsourced functions were packaging (60.4%), import/export management (58.3%), transportation management (58.3%), processing (56.3%), and warehousing (54.2%). Main reasons influenced the respondents to resort to outsourcing included suppliers' compatibility (83%), lack of in-house capability (73%), and complexity of function (56%). Lack of advanced communication systems and competition scored the highest as the most obstacles faced in SC execution with 3.39 and 3.32 respectively. The outsourcing model output indicated that those companies that outsource to solve short-term problems tend to adopt a short-term outsourcing policy which does not emphasize on relationship. On

the contrary, companies that tend to outsource to transform their businesses through significant improvements tend to outsource strategically in which strategic partnership must be sought. Otherwise, investing and performing internally is the best alternative.

The contribution of this research is that it has presented empirical evidence on the practices of outsourcing and SCM in the Malaysian food processing industry. Moreover, an outsourcing model was developed to assist food processing companies in identifying their outsourcing policies in accordance with the objectives of the outsourcing project.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia untuk memenuhi sebahagian syarat ijazah Doktor Falsafah.

**RANTAIAN BEKALAN DAN AMALAN PENYUMBERAN LUAR BAGI
INDUSTRI PEMPROSESAN MAKANAN**

Oleh

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Industri pemprosesan makanan di Malaysia telah mengalami perubahan yang ketara, didorong oleh keperluan syarikat rantaian besar dan perubahan corak penggunaan dan gaya hidup. Walaubagaimanapun, tiada kajian empirik yang telah dijalankan bagi menyelidiki kegiatan syarikat-syarikat dalam industri pembuatan makanan yang mengambil kira pengurusan rantaian bekalan dan penggunaan penyumberan luar. Malah, tinjauan literatur yang kritikal terhadap model penyumberan luar menunjukkan bahawa kebanyakan model yang dibina adalah kabur, dengan andaian penyumberan luar terbatas hanya untuk fungsi yang bukan teras dan tidak mempunyai kaedah yang jelas dalam proses membuat keputusan. Juga, antara model yang diuji, tidak terdapat model yang dibina khusus untuk industri pemprosesan makanan.

Oleh itu, kajian ini bertujuan untuk membangunkan model analisis terperinci penyumberan luar dan rangkaian bekalan dalam industri pemprosesan makanan di Malaysia bagi mengembangkan sebuah model yang akan membolehkan pihak syarikat

menentukan dasar penyumberan luar untuk sebarang projek penyumberan luar yang dirancang.

Data kajian ini diperolehi melalui sorotan literatur, temu ramah dengan pakar, dan kajian soal selidik. Kajian soal selidik tersebut digunakan untuk mengumpul imperikal data ke atas isu-isu penyumberan luar dan pengurusan rangkaian bekalan dalam industri pemprosesan makanan di Malaysia. Lima ratua soal selidik telah dihantar kepada syarikat-syarikat terpilih dalam jangka masa 5 bulan yang mana kadar respons terhasil berjumlah 11%. Keputusan model penyumberan luar tersebut telah dibina dengan menggunakan Analisis Proses Hirarki (AHP), dan disahkan dengan mengadakan temu ramah yang berstruktur kepada 25 pengurus pembelian dari pelbagai syarikat pemprosesan makanan dan dianalisa menggunakan *Expert Choice Software* (v. 9.5).

Hasil kajian menunjukkan bahawa prinsip moden SCM tidak menembusi secara menyeluruh ke dalam sektor pemprosesan makanan di Malaysia. Hanya 44% daripada responden mempunyai rakan kongsi strategik, dan 39% menunjukkan peningkatan dalam rakan kongsi strategik pada jangka masa 3 tahun terakhir. Syarikat-syarikat telah menggunakan penyumberan luar bagi kedua-dua fungsi, teras dan bukan teras. Lima fungsi teras penyumberan luar yang utama ialah pembungkusan (60.4%), pengurusan import/eksport (58.3%), pengurusan pengangkutan (58.3%), pemprosesan (56.3%), dan penyimpanan gudang (54.2%). Sebab-sebab utama yang mempengaruhi responden mengambil jalan untuk penyumberan luar termasuk kesesuaian pembekal (83%), ketidakupayaan syarikat (73%), dan fungsi yang kompleks (56%). Kekurangan sistem

komunikasi yang canggih dan persaingan merupakan halangan yang terbesar dihadapi dalam pelaksanaan SC yang mencatatkan nilai tertinggi masing-masing 3.39 dan 3.32. Syarikat yang mengguna penyumberan luar untuk menyelesaikan masalah jangka pendek, mengambil dasar jangka pendek untuk penyumberan luar tanpa menekankan pada pembinaan hubungan. Sebaliknya, syarikat yang mengguna penyumberan luar untuk memperbaiki perniagaan atau berubah kepada tahap yang lebih tinggi, lebih cenderung mengguna penyumberan luar yang strategik, dimana perkongsian strategik diutamakan. Jika tidak, melabur dan melakukan sendiri (dalaman) merupakan alternatif terbaik.

Sumbangan kajian ini telah menunjukkan bukti empirikal ke atas amalan penyumberan luar dan SCM di dalam industri pemprosesan makanan di Malaysia. Malah, sebuah model penyumberan luar telah dikembangkan bagi membantu syarikat pemprosesan makanan dan mengenal-pasti dasar penyumberan luar selaras dengan objektif projek penyumberan luar.

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I certify that an Examination Committee has met on 25th November 2008 to conduct the final examination of Ahmed Ali Al-Shahri on his Doctor of Philosophy thesis entitled "SUPPLY CHAIN AND OUTSOURCING PRACTICES IN THE FOOD PROCESSING INDUSTRY" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulations 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follow:

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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations, which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

Ahmed Ali Al-Shahri

Date: February 2009

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LIST OF ABBREVIATIONS

AHP	-	Analytical Hierarchical Process
CPFR	-	Collaborative Planning Forecasting and Replenishment
EC	-	Expert Choice Software
EDI	-	Electronic Data Interchange
ICT	-	Information Communication and Technology
QR	-	Quick Response
SC	-	Supply Chain
SCM	-	Supply Chain Management
VMI	-	Vendor-Managed Inventory

CHAPTER 1

INTRODUCTION

1.1 Introduction

In recognizing how critical the supply chain is to an overall corporate success, companies have invested significantly in research so as to improve their supply chain processes and systems. Pretorius (2001) asserted that the main focus of the business management over the past fifty years has been to obtain a maximum return for organization's stakeholders, such as in the organizations service management which have done this in various ways. The 1950's was known as the production era, where focus was placed on optimizing productivity. The 1970's saw strategy as the flavour of the decade, whereas in the 1980's and 1990's the focus shifted to customers, result quality and value. The change in focus in business management was a result of being constantly aware of certain parts of the organization. The latest change to quality and value, as the basis for business principles, has caused boards and management to re-assess the supply chain and its myriad of extensions (Pretorius, 2001).

Supply chain strategy development should be part of the business unit planning process which includes efforts aimed at developing and maintaining global information systems, addressing strategic aspects of outsourcing or 'make-or-buy' issues, and accessing and managing innovation with the purpose of protecting and enhancing core competencies

(Prahalad and Hamel, 1990). In addition, Handfield and Nichols (1999) stressed that every business is a part of a big supply chain and supply network. Therefore, presently, the outsourcing of selected organizational activities is an integral part of corporate strategy (Raja Mazlan and Ali, 2006). Therefore, outsourcing operations is the trend of the future, and those organizations which are already involved with outsourcing are satisfied with the result (Lankford and Parsa 1999). According to Ayliffe (2005), outsourcing continues to represent the main trend, and challenge, in purchasing and supply chain management today, the movement towards outsourcing is causing modern supply chains to become complex networks that link organisations, industries and economies.

Food manufacturing is generally considered as a part of the (semi-) process industry. Process industries in general and food manufacturers in particular have been considered as being large-scale, capital-intensive, mass producers of bulk products in large batches for low costs. This uniform picture of process industries has been challenged by empirical work by Dennis and Meredith (2000), who clearly showed the diversity in production systems in process industries. For many food manufacturers the scenario has changed due to trends in markets and changes in consumer's preferences. As a result, food manufacturers and specifically those that manufacture consumer products have adapted their product portfolio and production strategy in order to survive. The market for food products is more and more consumer-driven (Kinsey, 2003), and can be characterized by an increase in packaging sizes, products, recipes and product introductions (Meulenberg and Viaene, 1998), higher logistical performance due to restructuring in the supply chain of retailers (e.g. Wall-Mart), and

low margins in retailing and thus downward pressure on prices for the manufacturers (Dobson et al., 2002). As a result, food manufacturers face a dilemma, as on the one hand they have to produce in response to the market, but, on the other hand, they have to produce at the lowest cost. In other words, flexibility and dependability are needed and on the other hand high utilization. To complicate supply chain management initiatives further, Van Donk (2000) stressed that the food specific production characteristics in terms of plant, product, and production process, hence research that has been conducted in the food processing environment can not really be generalized without further investigation(s).

1.2 Background to the Study

Many authors have highlighted the lack of existing research dealing with practical perspectives of supply chain management and outsourcing (McIvor, 2000; Meixell and Gargeya, 2005; de Boer et al., 2006; Lieb and Randal, 1996; Boyson et al., 2004).

Although research that deals with outsourcing decision making have been developed (Probert, 1996; Vining and Globerman, 1999; McIvor, 2000; Fill and Visser, 2000; Momme, 2002; Tayles and Drury, 2001; Hafeez et al., 2002; Marshall et al., 2004; Styen, 2005; Hassanain and Al-Saadi, 2005; de Boer et al., 2006), the models (framework in some cases) have a common denominator in which the outsourcing process goes through four basic phases, namely; idea generation, evaluation phase, outsourcing process, and monitoring. According to de Boer et al. (2006), most outsourcing basically consists of a limited number of steps, common aspects, although not necessarily appearing in similar steps and/or in all models, are such as: