

**RELATIONSHIP OF VALUE CHAIN  
FLEXIBILITY AND SUPPLY CHAIN  
CAPABILITY TOWARDS SUPPLY CHAIN  
PERFORMANCE**

**QUAH HOCK SOON**

**DOCTOR OF PHILOSOPHY  
UNIVERSITI UTARA MALAYSIA  
2010**

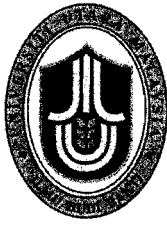
**RELATIONSHIP OF VALUE CHAIN FLEXIBILITY  
AND SUPPLY CHAIN CAPABILITY TOWARDS SUPPLY  
CHAIN PERFORMANCE**

**By**

**QUAH HOCK SOON**

**Thesis Submitted to the Centre for Graduate Studies,  
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in Fulfillment of the Requirement for the Degree of Doctor of Philosophy**

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*To my family  
for their source of inspiration and motivation*

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## ABSTRAK

*Keaslian disertasi ini merangkumi penyelidikan dalam bidang nilai rantaian fleksibel daripada sudut pengurusan operasi and perancangan rantai pembekalan. Justeru penyelidikan in telah menghasilkan peralatan penyelidikan and juga menghuraikan perhubungan nilai rantaian fleksibel, kecekapan perlaksanaan and rantai pembekalan.*

*Persaingan perniagaan yang bergantung kepada kos dan kualiti sahaja pada masa kini tidak padan sebagai “pemenang-permintaan”. Secara umum, pengurusan rantaian pembekalan dikenali ramai berupaya memberi kelebihan dalam persaingan. Pengurusan rantaian pembekalan yang menjanakan nilai dan bersesuaian terhadap perubahan dalam teknologi, persaingan dan permintaan amat berkesan dalam melaksanakan rantaian pembekalan.*

*Faktor-faktor ini telah memotivasikan penyelidikan dalam nilai-rantaian fleksible, kecekapan rantaian pembekalan dan pelaksanaan rantain pembekalan. Penyelidikan ini bertujuan menyelidiki tiga objektif. Objektif pertama bertujuan untuk memahami faktor dan perhubungan kecekapan rantaian pembekalan terhadap nilai-rantaian fleksibel. Objektif kedua bertujuan untuk memahami nilai-rantaian fleksibel terhadap pelaksanaan rantain pembekalan. Objektif ketiga bertujuan menyelidiki sama ada factor persekitaran memoderasasikan perhubungan di antara nilai-rantaian fleksibel dan pelaksanaan rantain pembekalan. Justeru itu, disertasi ini mengumpulkan maklumat-maklumat pengurusan rantaian bekaln daripada 121 organisasi di dalam Malaysia daripada sektor pengeluaran elektrik dan elektronik. Maklumat daripada empat organisasi dalam industry yang sama juga dikumpulkan untuk dianalisa selanjutnya.*

*Keputusan daripada penyelidikan menyokong hipotesis bahawa kecekapan rantaian di bidang teras, perkaitan dan organisasi mempengaruhi secara positif terhadap nilai-rantaian fleksibel dari segi rangkaian operasi, pembekalan dan logistik. Selanjutnya, nilai-rantaian fleksibel juga mempengaruhi secara positif pelaksanaan rantaian pembekalan demi manfaat dan kepentingan pelanggan kepada perniagaan secara ketara or bukan ketara. Kesan daripada perhubungan kecekapan rantaian perkaitan dengan pelaksanaan rantaian pembekalan melalui nilai-rantaian fleksible adalah lebih tinggi menunjukkan bahawa nilai-rantaian fleksible mempunyai kesan “intervening”. Analisa statistik menjumpai bahawa kecekapan teras, perkaitan dan organisasi dari segi pengeluaran yang “lean”, penundaan pengeluaran, persekutuan di antara pembekal-pembekal, penyebaran maklumat, pengurusan pengetahuan dan kepimpinan pengurusan mempengaruhi secara positif terhadap tahap nilai-rantaian yang fleksibel. Justeru itu, nilai fleksibel yang diperolehi daripada rangkaian operasi dan pembekalan mempengaruhi secara positif terhadap pelaksanaan rantaian pembekalan. Faktor persekitaran juga didapati tidak memoderasasikan perhubungan di antara nilai-rantaian fleksibel dan pelaksanaan rantaian pembekalan.*

*Bahagian kedua daripada analisis kes mengenalpastikan bahawa firma-firma mengaitkan kecekapan operasi untuk memperolehi kelebihan persaingan dari segi rantaian pembekalan. Firma-firma berikut tidak hanya bergantung kepada factor persekitaran sahaja tetapi sudah bergiat mempraktikkan pengurusan rantaian pembekalan demi fleksibel dan kelebihan persaingan.*

## ABSTRACT

*The originality of this dissertation derived from the approach to study value chain flexibility from the perspective of combining operation management with supply chain management. The originality also yielded new instrument developments and relationship among the variables established.*

*In a competitive business environment, competing on cost and quality is no longer an order-winner. Supply chain management has been widely recognized to deliver competitive advantage. Supply chain management that creates value and is adaptive to changes in technology, competition and volatile demand yields overall supply chain performance.*

*These factors motivated a study on value chain flexibility, supply chain capabilities and supply chain performance. There are three objectives for this research. The first objective is to understand the determinants and relationship of supply chain capabilities towards value chain flexibility. The second objective is to understand the determinants and relationship of value chain flexibility towards supply chain performance. The third objective is to investigate if environmental factor moderates the relationship between value chain flexibility and supply chain performance. This dissertation accumulated supply chain management information from 121 Malaysian's electrical and electronic organizations and detail experiences from four leading companies.*

*The research findings supported the hypotheses that core, relational and organizational supply chain capabilities positively impact the value chain to be flexible in terms of operation, supply and logistic network. Value chain flexibility has also a positive impact on supply chain performance comprised dimensions of business tangible and intangible customer benefits. The total effect of supply chain relational capability to supply*

*chain performance via value chain flexibility is higher than the direct relationship between supply chain relational capabilities to supply chain performance indicated the intervening effect of value chain flexibility. At statistical level of investigation, the research also found certain dimensions of the core, relational and organizational capabilities such as lean manufacturing, postponement, supplier alliance, information dissemination, knowledge management and management leadership have positive impacts on the level of value chain flexibility. Likewise, the value and flexibility acquired from operational and supply network impact positively on supply chain performance. Environmental factor does not moderate the relationship between value chain flexibility and supply chain performance.*

*The second part of case study confirmed that leading companies have leverage operational practices as supply chain capability to gain supply chain competitive benefits. Irrespective of the environmental factor, these companies have realized to leverage supply chain management to be flexible and stay competitive.*

## ACKNOWLEDGMENTS

This dissertation would not be possible with the help of individuals who have provided support and help throughout the process. My sincere gratitude goes to Associate Professor Dr. Zulkifli Udin who has been patient, providing guidance, encouragement, invaluable support and setting aggressive goals within each stage of this academic journey. Working with him has been a great experience. Special thanks to Associate Professor Dr. Ang Chooi Leng who has provided support in the empirical analysis and checking through the measurement instruments. Working with them has been a pleasant and fruitful experience. I hope to continue our long-term relationship. I am also grateful to the respondents who have responded to the survey and made the process of data collection speedier. The recognition provided by employer in terms of financial assistance has been memorable. Special thanks to fellow colleagues who provided encouragement.

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## ABBREVIATIONS

APICS	The Association of Operations Management
ENV	Environment
FMM	Federal Malaysian Manufacturers
JIT	Just in Time
MIDA	Malaysian Industrial Development Authority
NEM	Malaysia New Economic Model
MSC	Multimedia Super Corridor
SCOR	Supply Chain Operation Reference
SCM	Supply Chain Management
SCC	Supply Chain Core Capability
SCO	Supply Chain Organizational Capability
SCOR	Supply Chain Operation Reference
SCR	Supply Chain Relational Capability
SEM	Structural Equation Modeling
VCF	Value Chan Flexibility
VCL	Value Chain Logistic Flexibility Network
VCO	Value Chain Operation Flexibility Network
VCS	Value Chain Supply Flexibility Network
SCP	Supply Chain Performance
SCP-BT	Supply Chain Performance Business Tangible Results
SCP-CT	Supply Chain Performance Customer Intangible Results

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## CHAPTER 1: INTRODUCTION

### 1.1 Introduction

Supply chain integrates cohesive process flow of physical materials, information and cash flow across the value chain from manufacturers, suppliers and vast network of logistic distribution and customers. Business competition intensified into 1990s and 2000s in global market. Supply chain management (SCM) practices are chartered to deliver the right product, place, time, quantity, quality and condition to the customers at the lowest possible cost (Coyle, Bardi and Langley, 2003; Lummus, Duclos and Vokurka, 2003; Li, Rao and Nathan, 2006). SCM has become popular within practitioners, academicians and within professional organizations (Burgess, 2006).

In increasingly competitive environment, markets are more internationalized with dynamic customers. Customers are demanding more varieties, better quality, service and faster delivery. Organizational business models require lower cost, faster reactions to demand changes, improvements to manufacturing and supply network for competitive advantage (Chopra and Meindl, 2001; Porter, 1990). Customers are getting more empowered through information visibilities and have choices to choose. Power shift in the supply chain to retailers and distributions role is just as important as manufacturers to get product and services to customers. Deregulation and globalization requires business to deal with array of supply network to be successful (Coyle et al., 2003). With the advent of business challenges related to increasing environmental uncertainties, rapid product life cycles, and complex internal organizational response to demand changes and logistic complexities globally,

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