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DYNAMIC SUPPLY CHAIN CAPABILITIES: A CASE OF OIL AND GAS INDUSTRY IN MALAYSIA

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Universiti Utara Malaysia

DOCTOR OF PHILOSOPHY
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By

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ABSTRACT

Supply chain (SC) is a dynamic process that entails continuous flow of information, materials and funds across multiple functional areas, within and between chain members to meet customer's requirements and to maximize profit. However, organizations may encounter problems related to the dynamic process in SC. Oil and gas (O&G) industry is one of the SC entities which require dynamic processes of capabilities due to high degree of uncertainties. Motivated by the complexity and uncertainty of SC, this study intends to understand the concept of dynamic supply chain capabilities in the organizations specifically in Malaysia environment. The study focuses on the firm's capabilities dimensions as well as the influence of the environmental uncertainties on dynamic supply chain capabilities dimensions of the O&G industry. Previous literatures related to supply chain management, and dynamic capabilities were reviewed to support the study. The researcher analyzed multiple cases from the perspectives of the O&G players in Malaysia via qualitative research methodology. Nine managers of services contractors and one manager of production sharing contractor were selected for interviews to share experiences on the needs for dynamic supply chain capabilities. Results showed that value chain coordination, client, supplier and operations are important in the SC orientation; knowledge accessing and coevolving are vital to the dynamic supply chain capabilities; finally, ethics and professional values, and technology driven are important in the environmental uncertainties. Such findings are necessary for emergent framework of dynamic supply chain capabilities on how O&G industry can benefit. Hence, the main contributions of the research findings are: (i) contribution to the body of knowledge in developing better understanding on the dimensions of dynamic supply chain capabilities towards strategies; and (ii) contribution to the managerial in understanding and capturing emergent dimensions of dynamic supply chain capabilities by providing a basis for future analysis.

Keywords: dynamic supply chain, dynamic capabilities, supply chain management, oil and gas industry, qualitative research

ABSTRAK

Rantaian bekalan (SC) ialah satu proses dinamik yang melibatkan aliran maklumat berterusan, bahan dan dana merentasi pelbagai bahagian yang berfungsi di dalan dan di antara pemegang taruh serta rakan-rakan kongsi untuk memenuhi keperluan pelanggan bagi memaksimumkan keuntungan. Bagaimanapun, organisasi berkemungkinan menghadapi masalah berkaitan dengan proses dinamik di dalam rantaian bekalan. Industri minyak dan gas (O&G) adalah salah satu entiti rantaian bekalan dan memerlukan proses keupayaan dinamik disebabkan tahap ketidakpastian yang tinggi. Didorong oleh kerumitan dan ketidakpastian rantaian bekalan bagi industri minyak dan gas, penyelidikan ini bertujuan untuk memahami konsep keupayaan rantaian bekalan dinamik dalan organisasi bagi persekitaran Malaysia. Penyelidikan ini memfokuskan kepada dimensi keupayaan firma serta pengaruh ketidakpastian alam sekitar kepada dimensi keupayaan rantaian bekalan dinamik bagi industri minyak dan gas. Ulasan karya yang terdahulu berkaitan dengan pengurusan rantaian bekalan dan keupayaan dinamik dikaji semula bagi menyokong penyelidikan ini. Penyelidik menganalisa beberapa kes dari perspektif syarikat kontraktor perkhidmatan minyak dan gas di Malaysia melalui kaedah penyelidikan kualitatif. Sembilan orang pengurus kontraktor perkhidmatan dan seorang pengurus kontraktor perkongsian pengeluaran ditemubual bagi berkongsi pengalaman mengenai keperluan keupayaan rantaian bekalan dinamik. Hasil penyelidikan menunjukkan bahawa nilai koordinasi rantaian, pelanggan, pembekal dan operasi penting dalam orentasi rantaian bekalan; pengaksesan pengetahuan dan perkembangan bersama organisasi amat penting kepada keupayaan rantaian bekalan dinamik; akhirnya, etika dan nilai-nilai professional, dipacu oleh teknologi adalah penting dalam ketidakpastian alam sekitar. Hasil penemuan yang dikenalpasti adalah perlu bagi menghasilkan rangka kerja baru bagi keupayaan rantaian bekalan dinamik tentang bagaimana industri minyak dan gas boleh memanfaatkannya. Sehubungan dengan itu, sumbangan hasil penyelidikan ini adalah: (i) kepada ilmu pengetahuan dalam membina pemahaman yang lebih baik bagi dimensi keupayaan bekalan dinamik terhadap strategi; dan (ii) sumbangan kepada pengurusan dalam memahami dan menguasai dimensi baru keupayaan rantaian bekalan dinamik dengan menyediakan asas kepada analisa di masa depan.

Kata kunci: rantaian bekalan dinamik, keupayaan dinamik, pengurusan rantaian bekalan, industri minyak dan gas, penyelidikan kualitatif

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LIST OF ABBREVIATIONS

3PL	-	Third Party Logistics
CDU	-	Crude Distillation Unit
COGEN	-	Power / Cogeneration
CUF	-	Central Utility Facilities
E&P	-	Exploration and Production
EPCC	-	Engineering Procurement Construction & Commissioning
EPCIC	-	Engineering, Procurement, Construction, Installation, Hook-Up And Commissioning
ETP	-	Economic Transformation Program
FPSO	-	Floating Production, Storage And Offloading Units
FSO	-	Floating Storage And Offloading Units
FSU	-	Floating Storage Units
GDP	-	Gross Domestic Product
GNI	-	Gross National Income
HSSE	-	Health, Safety and Environment
IRM	-	Inspection, Repair and Maintenance
IT	-	Information Technology
LNG	-	Liquid And Gas
MODU	-	Mobile Offshore Drilling Unit
MOPU		Mobile Offshore Production Unit
NKEA	-	National Key Economic Areas
O&G	-	Oil And Gas
OIC	-	Offshore Installation Contractor
OPI	-	Offshore Pipeline Installation
OSI	-	Offshore Structural Installation
QHSE	-	Quality, Health, Safety and Environment
R&D	-	Research and Development
RBV	-	Resource-Based View
ROI	-	Return On Investment
SCM	-	Supply Chain Management
ULCC	-	Ultra Large Crude Carrier
VLCC	-	Very Large Crude Carriers

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Supply chain management (SCM) has acknowledged a great deal of interest by researchers and practitioners. SCM has become universal way across industries since it addresses seller-buyer partnerships, shared planning, continuing strategic coalition, control of inventory cross-organizational, information sharing and logistics management. Effective SCM will lead to provide the necessary level of customer service to a specific segment by reduction of the entire amount of resources and enhancing customer services through improved product availability and reduced order cycle time (Banomyong & Supatn, 2011; Crainic & Laporte, 2016; Stevens & Johnson, 2016; Wang, Gunasekaran, Ngai, & Papadopoulos, 2016).

SCM adopts systems perspective across firms and functions as an absolute system by processes of coordination. Thus, the key to the creation of supply chain value are possible, made through collaboration among participating firms. Companies may engage in information exchange and structural collaboration. Information exchange may include the inventory supervision, forecasting techniques and delivery. Meanwhile, the structural collaboration may include vendor-controled inventory, outsourcing, co-locating factories and just-in-time (Co & Barro, 2009). Whilst, Iyer (2011b) identifies demand chain collaboration can be referred to the lifelong affairs with partners in downstream supply chain to create end-customer value. It is characterized through the information exchange, operations, cross firm forecasting and shared planning with downstream partners. Meanwhile, Raja Mazlan and Ali

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