Chapter - II
Research Methodology & Review of Literature

2.1 Rationale of Study

In an area of professionalism, underestimating the significance of oil and natural gas in modern civilization is mainly associating with petrol or diesel that they put in their cars. However, the values of oil to our world goes far beyond our personal transportation choices as many of the everyday items we use are either made from oil or are dependent upon oil for their production. The fruit and vegetables on supermarket shelves are highly dependent upon oil - from the fuel oil used to harvest and then transport these goods around the world, to the petrochemical feedstock used to manufacture the pesticides and herbicides that maintain high yields. Many consumer goods are made of plastic, a material utilizing petrochemicals in its manufacture. Many common medical and pharmaceutical products also have oil as a basic constituent. The aspirin, originally processed from the bark of the willow tree, is now another of these many oil derivatives.

Oil has proven to be such a flexible resource that it now underpins many of the items we take for granted in the modern world, and any interruption of its supply would be very serious. Our civilization is built on oil, and an ever expanding supply of oil is vital to continued economic growth. Without Adequate supply of the vital petroleum products, the entire life- system, from common man to industries, comes to a halt. Many of us, at some stage or the other have experienced the shortage or unavailability of petroleum products in ours life and are aware of its effect on our daily life. Secure & Constant availability of petroleum products is the back-bone of any Economy.

This incited me to undertake the study relating to the Supply Chain Management of Petroleum Industry with special references to working of Indian Oil Corporation, Hindustan Petroleum & Bharat Petroleum in Marathwada Region.
2.2 Objective of Study:

Very Little Literature is available on the petroleum industry’s Supply Chain Management in India. This Research Attempts to Enhance the Understanding of Supply Chain Management Practices of Petroleum Industries and its effect on the Availability and Price of petroleum products.

The Research Has Following Objectives:

1. To Understand the Importance of Supply Chain Management in the petroleum industry related to Petrol & Diesel.
2. To Study the Supply Chain of Petroleum Industry in India and Marathwada Region in Particular.
3. To Study the Role of Information Technology in Revamping The Supply Chain of Petrol & Diesel.
4. To Study the bottlenecks in Supply Chain of Petrol & Diesel.
5. To Study the Pricing Policy Followed by Petroleum Industry.

2.3 Hypothesis to Be Tested

H1: Efficient Supply Chain Management of Petroleum Industry will lead to adequate availability of petroleum products.

H2: Utilization of SCM Software will minimize the time and manpower required for managing the information in Petroleum Industry

2.4 Research Methodology:

Collection of Data:

A. Primary Data

The Data is collected from Petroleum Industry Experts and People Involved in Supply Chain of Petroleum Products through structured Questionnaire, Telephonic Talks & Personal Visits.
B. Secondary Data

The Secondary Data is gathered from the following sources:

1. Books & Reports
2. Case Study Analysis

C. Tools & Techniques used:

1. Percentage Analysis
2. Flow Charts

D. Sample

The Sample contains 7 big & small petroleum industries in India, namely, Indian Oil Corporation Ltd, Hindustan Petroleum, Bharat Petroleum - All Three Public Sector units & Some Private Companies like Reliance, ESSAR, Shell and Kaine.

Out of these, nearly 97% of market share belong to the 3 PSU, Indian Oil Corporation, Hindustan Petroleum & Bharat Petroleum. Hence, I have decided to include sample for my research based on three major Petroleum Industries.

Table 2.1 - Retail Outlets in Marathwada:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>District</th>
<th>HPCL</th>
<th>BPCL</th>
<th>IOCL</th>
<th>District Wise Retail Outlet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aurangabad</td>
<td>42</td>
<td>52</td>
<td>66</td>
<td>160</td>
</tr>
<tr>
<td>2</td>
<td>Beed</td>
<td>26</td>
<td>23</td>
<td>23</td>
<td>72</td>
</tr>
<tr>
<td>3</td>
<td>Hingoli</td>
<td>6</td>
<td>13</td>
<td>11</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>Jalna</td>
<td>19</td>
<td>22</td>
<td>20</td>
<td>61</td>
</tr>
<tr>
<td>5</td>
<td>Latur</td>
<td>25</td>
<td>30</td>
<td>33</td>
<td>88</td>
</tr>
<tr>
<td>6</td>
<td>Nanded</td>
<td>23</td>
<td>26</td>
<td>35</td>
<td>84</td>
</tr>
<tr>
<td>7</td>
<td>Osmanabad</td>
<td>13</td>
<td>17</td>
<td>20</td>
<td>50</td>
</tr>
<tr>
<td>8</td>
<td>Parbhani</td>
<td>15</td>
<td>9</td>
<td>23</td>
<td>47</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Company Wise Retail Outlets</strong></td>
<td><strong>169</strong></td>
<td><strong>192</strong></td>
<td><strong>231</strong></td>
<td><strong>592</strong></td>
</tr>
</tbody>
</table>

Source: Compiled From Primary Data
During the pilot survey, it was found that there are 592 Retail Outlets of IOC, BHCP & HPCL in Marathwada Region, out of which, for the sake of convenience I have decided to give balanced representation to all 3 Companies, 100 Retail Outlets, which amount to more than 10% is taken as a sample for study with HPCL – 33, BPCL – 33 & IOC – 34 Retail Outlets, across Marathwada.

2.5 Scope of the Study

The Study is an attempt to make a working appraisal of SCM, through effectiveness of a supply chain depends on many factors; of a company’s own current situation and strategies, but there are at least ten parameters that need to be seen for assessing the effectiveness of any supply chain and logistics. The list is based primarily on an assessment of the relative “Pain to Gain” ratio that most companies seems to experience when pursuing each category.

Further Research can be undertaken in following area:

1. A Study of Alternative Fuels & it’s marketing in India.

2.6 Limitation of the Study

The Petroleum Supply Chain Starts with the sourcing of Crude Oil. India’s Crude Oil Requirements are met largely through imports. India Imports 70% of its Crude Oil Requirement, out of which 67% comes from the Middle East Region. In the recent past, Most of the countries in Middle East region have been going through one or the other turmoil, which has always had an adverse effect of the Imports of Crude Oil.

Irrespective of how appropriate & effective our Supply Chain Management of Petroleum Industries is, even the slightest decrease in Imports of crude oil hampers the entire system. Hence, The Study is Limited to three Public Sector Units only which has a market share of 97% amongst them. As the researcher alone
undertook the study, due to time, money and physical limitations, geographically the study is Limited to Marathwada region only.

2.7 Review of Literature

Literature review focuses on SCM & Pricing of Petroleum Products, Literature Related to Supply Chain Management, Petroleum Industry in India, Pricing Policies of Petroleum Products in India are presented. Other factors affecting the SCM & Pricing of Petroleum Products Such As SCM Software, MIS, Geographical & Political Challenges Related to Import of Crude Oil, etc are also presented.


Sunil Chopra & Peter Meindl Discusses in this book the strategic role of the supply chain, key strategic drivers of supply chain performance and the tools and techniques for supply chain analysis. The Authors identify inventory, transportation, information, and facilities as the key drivers of supply chain performance. This book then conveys how these drivers may be used on a conceptual level during supply chain design, planning, and operation to improve performance. For each driver of supply chain performance, the goal is to provide practical managerial levers and concepts that may be used to improve supply chain performance.


This book discusses implementing new supply chain projects using the official techniques of The Supply Chain Council. It provides step-by-step guidelines of the entire Supply Chain Operations Reference (SCOR) Model, showing how to
align workflow, define business opportunity, use metrics to determine success, and gain internal support. Besides the guideline on step-by-step process for completing a successful project, it has a built-in timeline to assist you in accurately projecting when a project will begin to reap the benefits of reshaping your supply chain. Utilizing the process steps as outlined will result in a project portfolio of recommended improvements which will be easy to prioritize based on the rating system included in the process.


Supply Chain Management: Text and Cases, integrates concepts and application to turn the spotlight on innovations. The Author presents the concept of SCM using illustrative examples, caselets and case studies from the Indian context. Divided into five parts, this book presents numerous examples and caselets, thus blending concepts with current industrial practices and state-of-the-art know-how, for enhanced understanding and a holistic view of supply chain management. A complete part of the book is devoted to innovations in supply chain management that may be used by firms operating in competitive markets to improve their performance.


The Author brings forth that globalization and rapidly evolving technologies have accelerated and refined the procurement function in every industry and at every scale. 'The Sourcing Solution' presents an overview of new sourcing strategies & tools. It offers clear overview of the new tools of sourcing success, including e-commerce and Internet strategies, supply-chain management technology, inventory auction sites, strategic sourcing initiatives, offshore and international sourcing.

The book addresses the issues of Supply Chain Management in seven parts, which deal with the basics of the supply chain, sub-systems of the supply chain, tactical and operational decisions and strategic approach to the supply chain, measurements, controls and sustainability practices. The author has used diagrams and examples for better explanation of the concepts. A part devoted to 15 comprehensive case studies is included of Indian companies such as Ambuja Cement Ltd, United Art Logistics, Shri Mahila Griha Udyog Lijjat Papad Cooperative Society, ITC Limited, Zapak Ltd, etc.


The book provides a great reference model ("Lean Extended Enterprise Reference Model-LEERM") for understanding the structure and framework for assisting companies, their customers, and suppliers in transitioning to a total value stream conversion to lean. This Book goes beyond addressing the applications of lean tools such as, Kanban, SMED, etc, and discusses the entire methodology for implementing such tools. The authors discuss how to integrate the total value stream — vertically, horizontally, and laterally and achieve success through empowered people and teams, cultural transformation, and an integration of Lean, Six Sigma, Kaizen, and enabling technologies such as ERP, SCM, APS, CRM, PLM, networks, exchangers, and portals. Using the Lean Extended Enterprise Reference Model (LEERM), the authors demonstrate that by deploying the right methodologies and technologies to the right situation you can achieve huge breakthroughs in performance.

The Author Present unexpurgated story of oil, from the circumstances of its birth millions of years ago to the spectacle of its rise as the indispensable ingredient of modern life. It then brings forth the Geographical and political challenges of Oil.


‘Supply Chain Logistics Management’ examines traditional logistics issues within the context of the supply chain. This Book studies internal functions of an organization with inclusion of issues that relate to the entire supply chain. ‘Supply Chain Logistics Management’, provides a solid foundation that clearly describes the role of logistics within the supply chain, portraying a complete view of the subject and going farther to show how all the pieces fit together. The authors of the book discuss Supply Chain Logistics Management with a lot of industrial insights as supporting cases.


‘The Toyota Production’ System is the benchmark used throughout the world for “lean” thinking. The authors of the book, being industry insiders and former Senior Executive of Toyota, describe in detail ‘Toyota’s Supply Chain’, explaining the operations and the logic behind them. The Book help you design and oversee significant improvements to your supply chain, including Sales planning, Production scheduling, Supplier Management, Logistics, Parts ordering, Demand fulfillment. The authors pool their extensive and well-rounded
knowledge to provide “how-to” insights for applying the lessons of Toyota in any industry. Using enables readers to create operational efficiency by better connecting offices, plants, facilities, and vendors.

10. David Blanchard, (2010), Supply Chain Management Best Practices, Wiley, 2nd edition, ISBN-10: 0470531886, ISBN-13: 978-0470531884. This Books Demonstrates how to build supply chains that works, by illustrating how leading companies are doing it. Identifying world-class supply chains in more than a dozen different industries and explaining in detail how these companies got to where they are. This book reveals the proven strategies, solutions, and performance metrics used by leading companies to design their extended enterprises. It also offers guidance on the latest technology, green supply chains, going lean, how to choose third-party logistics providers, and how to manage the supply chain in a global environment.


This results-based book examines the experiences of today's most accomplished companies to demonstrate supply-chain innovation at work in the marketplace. The Authors of the books presents case studies on Innovative Supply Chain Management of the leading companies like Coca cola, Walmart, dell, Amazon, etc.


This Book offers a comprehensive look at the role of SCM within an organization. It demonstrates how to manage a supply chain across an enterprise, encompassing technological, financial, procurement, and operational issues. It Covers A primer on supply chain and finance, Elements of a supply chain model, The scope of the supply chain, Demand and supply planning, Supply chain network design, Transportation and warehouse management, Supply chain collaboration, Reverse logistics management, Supply chain technology. It clearly explains how each process works and the relationship between them.


"Managing Project Supply Chains" demonstrates how customized supply chain management can be applied to Project Management, ensuring project resources are delivered as required, reducing delays and costs and promoting a successful outcome.

The Author of the book considers an organization's "business condition" as a contributing factor in the development of a strategic procurement strategy. That is, rather than taking a "one-size fits all" approach, the author's more individualized approach illustrates techniques specific to organizations operating in a standard or crisis environment. The Author Discusses, Methods for developing and tracking strategic procurement initiatives, planning in the "standard" and "crisis" environments.


Focusing on the lean supply chain from an operations perspective, this insightful book offers a thorough overview, covering the activities of all the companies involved in the flow of products, services, finances, and information - from the initial suppliers to the ultimate users. It provides candid discussions of managers' tasks and responsibilities and how they may be best accomplished through the use of such conceptual tools as lean thinking, theory of constraints, and the balanced scorecard. The book integrates the discussion of theory of constraints with the lean supply chain, illustrating how both champion the use of pull to create the flow of goods and services through the value chain while emphasizing that lean is indeed a growth strategy.


This text discusses the role of logistics in achieving corporate and financial goals. It introduces the practitioner to some of the frontiers of strategically driven service response logistics such as, how to design, deploy and organize integrated SCM for corporate strategic reasons & for functional cost control.

The Book Address Supply Chain Management as it concern with the ‘Integration’ of firms in the face of coordinating materials and information flows within a procurement-production-distribution network in order to attain the enterprise’s goals. The book emphasizes on improving the efficiency of supply chain management with the usage of information technology.


This book provides insights regarding the concepts of Enterprise Resources Planning (ERP) systems being used for transaction handling and order execution in most firms today that have been supplemented by Advanced Planning Systems (APS) for coordinating flows, exploiting bottlenecks and keeping due dates. Special emphasis is given to modeling supply chains and implementing Advance Planning System in industry successfully. The Book offers six case studies covering a wide range of industrial sectors and ideas to implement APS successfully.


Inventory Accuracy: People, Processes & Technology provides a comprehensive treatment of inventory accuracy in distribution, fulfillment, and manufacturing environments. The Book provides with details on physical inventories, process evaluation, training, accountability, and various
technologies including bar codes, voice technology, RFID, and light-directed systems. In addition to documenting the standard tools and techniques used to achieve accuracy, the author provides insights as to why many of the standard solutions don’t provide the best results and offers alternative methods. The focus on practical solutions that take into account the sometimes-conflicting priorities that affect accuracy, results in an approach that not only looks good on paper, but more importantly, works in the real world.


The Authors of The Book present concepts which helps understand the benefits and nuances of the modern ERP system. The Book gives detail information of Implementation of ERP for a fully integrated business system covering each and every aspect of a business such as materials, production, sales & distribution, plant maintenance, quality management, project management, production planning, accounting and Human Resources.


- Retail sales and e-commerce
- Inventory management
- Procurement
- Order management
• Customer relationship management (CRM)
• Human resources management
• Accounting
• Financial services
• Telecommunications and utilities
• Education
• Transportation
• Health care and insurance

The Book Provides an Extensive Details of the Application, Designing & Implementation of Data Warehouse for various business applications.


This Book Present the History of E-Commerce, In Particular, it focuses on e-transition challenges for Indian corporate. The Author presents very useful case studies of E-Transition of Indian Corporate Like ICICI Bank, TELCO, Hindustan liver, Asian Paints, etc. The In-Sights Presented in this book using these case studies helps one understand the challenges and benefits of E-Commerce for Indian corporations.


The Article Discusses the cause behind the steep rise in oil prices over the last 5 years. The Author States that the reasons for such a phenomenal rise are many: one, the boom in the global economy that is being witnessed across the globe; two, post-2003, almost 90% of the demand for oil essentially coming from developing economies such as China and India. Three, the
increased purchasing power among the middle-class of developing countries that has resulted in a substantial increase in the demand for private transportation; and four, the fact of quoting oil prices in dollars—a currency that has depreciated by almost 25% in real effective terms since 2002—has only made oil sound cheaper in non-dollar regions leading to increased demand for oil from such zones.


The Articles provides insights on the consumption of oil especially by west and the new economies like china. The Authors present statistics such as; the US alone consumed as much as 25% of the oil produced in the world and that, too, hardly with 5% of the world population. According to one estimate, the world today uses 3-4 barrels of oil per every new barrel discovered. In 2004, China alone accounted for 44% rise in the global demand for oil. The author states, “Civilization as we know it will come to an end sometime this century unless we can find a way to live without fossil fuels”.


John Browne, the Head of BP (British Petroleum), Europe's second largest oil company and world's third largest after ExxonMobil and Royal Dutch Shell, announced in January, this year, the decision to step down from his post 17 months ahead of his scheduled retirement. The Authors of the article brings forth the reasons behind this, as the news took market and industry watchers by surprise.

The Article Provides statistics on the rapid growth of Indian and Chinese economies resulting in huge demand for petroleum products. This economic boom has forced both the nations to import more crude oil than ever before and search for new oil reserves. The author states that china is way ahead in securing its future energy need.


The Author of the article brings forth the various challenges faced by the crude oil trading companies. The purpose of this article is to focus on Crude Oil Trading Companies and what strategic issues they must address, when a risk management program is designed.

29. Dr. B. V. Shenoy, (Aug-06), The Analyst Magazine, Alternative Energy: End of the Oil Age?

The Article Shed Light on the constant increase in the oils prices in the second half of the last century and states the reason behind it such as the Iranian revolution, the Iran – Iraq war, etc. In the present context, the author proposes that the fossil fuels are finite where as our need for energy is ever growing and infinite. Hence, the world must turn to explore new alternate energy sources urgently.

30. Y Bala Bharathi and Sanjoy De, (November 2009), The Analyst Magazine, Global Oil Discoveries

This Article Puts Forth The Statistics of Oil Explorations by various companies and states how the Oil Exploration is at its Peak in Nov 2009 Due To High Oil Prices. It Also Present the Fragile Relationship between Oil
Exploration & Oil Prices. The Author cautions that low oil prices may hamper the highly sophisticated and hugely expensive exploration drive of oil companies, not to mention the oil discoveries.


The Article Discusses That From the late 1990s to 2007, oil prices had risen to a historical record. This sustained soaring of prices has resulted in a massive transfer of financial assets from oil consuming regions, mainly the US, Europe and Asia, to major oil-exporters—members of the Organization of Petroleum Exporting Countries (OPEC), Russia and Norway. In order to manage these large and fast-growing oil revenues, exporting countries have set up government-owned and government-managed oil funds. The rise in the number and size of these oil funds represents a dramatic increase in the role of governments in the ownership and management of international assets and its potential impact on economic systems domestically as well as their role in global business have been under increasing scrutiny.


The Author Present the Chemical & Biological Process of Formation of Crude Oil under the Earth Surface and describes the various stages of Crude Oil Refining and its several Derivatives such as liquefied petroleum gas (LPG), gasoline, jet fuel, kerosene, etc produced at the different level of refining process.
33. **Barchi Peleg, (Jan 2003), Effective Executive Magazine, Supply Chain Collaboration and Standardization**

The article discusses how better supply chain collaboration can improve a variety of business processes and enhance profitability. Taking advantage of e-business solutions within application areas such as Customer Relationship Management (CRM), Supply Chain Management (SCM), Supplier Relationship Management (SRM) and Enterprise Resource Planning (ERP) can be of much value and help companies to better prepare for and respond to the demands of its customers.

34. **Prof. Pankaj M Madhani, (Jul-07), Global CEO Magazine, RFID-Enabled SCM**

The Author discusses various issues faced by the Retail Industry like stock-outs, inventory management, product recalls, theft, shrinkage and product counterfeiting and proposes enhancing visibility in supply chain by strengthening communication network and deploying RFID for checking movement of products. RFID deployment may help them in solving such problems as supply chain partners will have the ability to foresee the movement of inventory, goods and customer demand, enabling them to plan ahead.

35. **S Jaya Krishna, (Dec 2006), Global CEO Magazine, Supply Chain Management in the Internet age**

The Article Sheds Light on the Several Benefits of IT Enabled Services for the Optimization of Supply Chain Management of an Industry across the Various Participating Companies in the Supply Chain Network.
36. Rakesh Singh, (July 2004), Global CEO Magazine, Supply Chain Management: The Indian Scenario

This article is an attempt to understand supply chain management in Indian companies. It probes into broader trend, which explains the status of SCM in India and suggests the requirements for the implementation of a successful supply chain.

37. S Murali, (September 2009), HRM Review Magazine, HRMS and SCM Intersection: A Perspective

This article examines the specific role of HRM and Organizational Behavior (OB) specialists in performing the functions of Staffing, Training, Evaluation and Compensation effectively, to support optimal performance of the entire supply chain as an integrated unit.


This paper investigates the relationship between changes in oil prices and the UK's manufacturing and services sectors performances.

39. S Subramanian, (June 2005), Effective Executive Magazine, Control over Crude Oil Prices: The OPEC

We know that Organization of Petroleum Exporting Countries (OPEC), a group of sovereign countries, controls a major chunk of oil production. But most people do not know how exactly OPEC controls the production and prices of crude oil. In this article the author analyzes the history of oil industry to understand how and why the OPEC controls oil prices.
40. S Subramanian and Srivyal Vuyyuri, (March 2004), The IUP Journal of Applied Economics, Relationship between Oil Consumption and GDP: A Study in India

This paper contributes to the role played by oil consumption in the growth of an economy with specific references to the Indian economy. It presents a long run co-integrating relationship between real GDP and oil consumption and also a feedback effect between these variables.

41. Bani Kochar and G N Pandey, (October 2008), The IUP Journal of Corporate Governance, Values and Indian Organizations: A Case Study on ONGC Ltd.

The Authors of The Study Proposes that Those Organizations with “VALUES” as their foundation have succeeded through the test of times at various periods of turbulence. They Put Forward the Examples of the Tatas and the Birlas that have survived the testing times with continued growth and success. This study, therefore, analyzes the value system of a public sector company, Oil and Natural Gas Corporation Limited (ONGC).

42. Ankit Mehrotra, (June 2008), The IUP Journal of Information Technology, IT-Enabled Logistics & SCM: A Tool for Optimizing Operational Efficiency

The study Proofs benefits of having IT-enabled Logistics & SCM. The study, conducted using the survey method presents the data that was collected through a structured questionnaire from a sample of 80 companies.
43. Juhana Salim, (September 2006), The IUP Journal of Knowledge Management, A Case Study on Knowledge Management Practices in an Oil Company in Malaysia

This paper focuses on the Knowledge Management (KM) practices in an oil company in Malaysia. The study answer some of the research questions that need concrete answers like: the perception of KM as perceived by the oil company being studied, the effectiveness of KM activities, sources of knowledge practices, the personnel that play the main role in KM initiatives, KM initiatives practiced in the concerned oil company and whether they measure the effectives of the Knowledge Management practices.


This paper outlines the various functions, characteristics and the scope of supply chain modeling, identifying the key challenges and opportunities for researchers in supply chain management; in an effort to help firms capture the synergy of inter-functional and inter-organizational integration and coordination across the supply chain, and to subsequently make better decisions.

45. Samyadip Chakraborty, (December 2010), The IUP Journal of Supply Chain Management, Concise Chronological Road Map of Evolving Green Supply Chain Management Concepts:

This Paper throws light on the eco-friendly sustainability aspects of SCM operations and logistics on one hand and speaks about the reduced environmental footprints left behind by human activities on the other. It Terms it as Green SCM or GSCM. It portrays the gradual development and a shifting trend towards green initiatives in the operational practices of organizations, so as to conform to the need of the hour and move towards a sustainable and eco-friendly business environment.
46. Melek Akgun & Meltem Gurunlu, (March 2010), The IUP Journal of Supply Chain Management, Cash to Cash Cycle as an Integral Performance Metric in SCM

This study presents a theoretical lens by examining the factors influencing Cash to Cash Cycle as an integral metric for the performance evaluation of supply chains.


The Authors of The Paper States That For Calculating the Efficiency Any Process, Comparison With The Standard Process if Required. Where As, Given The Complex Nature of Supply Chain Management, No Such Standards Exist For Benchmarking. So, there is a need to formulate models for measurement and improvement. In this paper, an attempt has been made to measure efficiency by different techniques and the same has been explained through a case study on Indian ports. The paper mainly uses Data Envelopment Analysis (DEA) and Analytic Hierarchy Processing (AHP) as tools for measuring efficiency.

48. Laurel Evelyn Dyson and Susan Koruth, (March 2006), The IUP Journal of Supply Chain Management, Improving Business Performance through Supply Chain Intelligence: An Australian Perspective

The Authors of the article Explains “Supply Chain Intelligence (SCI)”, a tool derived from data warehousing technology, which enables the partners of a supply chain to collaborate by providing visibility of information and online analytical capabilities across the chain. The benefits and challenges of implementing SCI are discussed from an Australian perspective with the example of an Australian manufacturer who has successfully adopted SCI.
49. H. Mann, U. Kumar, V. Kumar & Inderjit Singh, (November 2010), The IUP Journal of Operations Management, Drivers of Sustainable Supply Chain Management

   This paper identifies the drivers that motivate firms to the move towards creating sustainable supply chains. An objective-oriented taxonomy is suggested to situate drivers of supply chain management in a sustainable environment. This unique view allows for clear delineation of the drivers and will potentially form the basis for future research in sustainable supply chain management.

50. Gunjan Soni and Rambabu Kodali, (December 2008), The IUP Journal of Supply Chain Management, Evolution of Supply Chain Management: Developments in Academia and Industry

   This paper accounts for the evolution of SCM in academic and industrial domains. It traces logistics strategies from ancient times till the present day that led to development of SCM paradigm. Future aspects of SCM, based on the past and present trends, have been proposed.

51. N.M Shanthi, (January 2005), Marketing Mastermind Magazine, Managing Customer Relations: An Indispensable Link in the SCM Process

   This article brings out the importance of lean operations coupled with good business acumen to benefit the customer by the synergy between Supply Chain Management and Customer Relation Management.
52. R. Ohdar and P. Kumar, (December 2006), The IUP Journal of Supply Chain Management, SCM Practices in Indian Manufacturing Companies

This paper assesses the present status and scope of SCM practices through an extensive survey conducted among the Indian manufacturing companies. A number of issues such as role of Information Technology (IT), areas of IT application, benefits of employing SCM, supply chain performance measures, issues hindering SCM practices, common barriers in SCM implementation, and government policies promoting SCM practices have been addressed in the context of the Indian manufacturing companies.


This article analyzes the factors responsible for the changes in the crude oil prices such as US Dollar’s Depreciating value & Geopolitical Challenges. It also predicts the future movement of the oil prices.


The article determines the reasons for the mounting global oil prices. It discusses factors like the strong recovery of US economy and the rapid economic growth in Asia as a contributing factor for high oil prices.

55. Raed Hussain, (July 2005), Modeling the Supply Chain SWAP Problem in the Petrochemicals industry, PhD Thesis, The Faculty of C.T Bauer College of Business, University of Houston, Texas (USA)

The Steady Demand for Oil Across the globe has forced petroleum giants to outsource, ally or collaborate the supply chain networks with their competitors. This form of collaboration is referred to as ‘systematic
“cooperative reciprocal barter” or SWAP of supplies, assets, market shares or even the entire business processes with the competitors.

This Dissertation aims at developing a mathematical model that can be used in supply chain networks for petroleum industries where such collaboration (SWAP) exists. This model enables managers in making SWAP decision by determining What, Where & How Much to SWAP with the competitors and how much to reduce the supply chain SWAP cost in order to maximize saving. In Order to test the effectiveness of the model it is applied to a real case scenario from the petrochemical industry where the results of the model are compared to the result of current industry practice used in the case.


This thesis provides a framework for the planning, integration and coordination of multisite refinery and petrochemical networks using proper deterministic, stochastic and robust optimization techniques. The contributions of this dissertation fall into three categories; namely, a) Multisite refinery planning, b) Petrochemical industry planning, and c) Integration and coordination of multisite refinery and petrochemical networks.

The First Part the thesis tackles the integration and coordination of a multisite refinery network. It addresses the design and analysis of multisite integration and coordination strategies within a network of petroleum refineries through a mixed-integer linear programming (MILP) technique.

The second part of the thesis addresses the strategic planning, design and optimization of a network of petrochemical processes. It First give an overview of the deterministic version of the petrochemical industry planning model and Then extends the model to address the strategic planning, design and optimization of a network of petrochemical processes under uncertainty and robust considerations.
The third and final part of this dissertation addresses the integration between the multisite refinery system and the petrochemical industry. It proposes a framework for the design and Analysis of possible integration and coordination strategies of multisite refinery and petrochemical networks to satisfy given petroleum and chemical product demand. This work develops a methodology for the simultaneous analysis of process network integration within a multisite refinery and petrochemical system.


The objective of this research was to contribute to the international debate on how sustainability in the supply chain can be achieved in practice at a regional level, and more specifically to identify what the drivers and barriers are for delivering such sustainable changes. In this sense the outcome of the study aid in the increase of the overall understanding concerning SCM in the greater Pearl River Delta region where products are usually sourced, manufactured, packaged and transported to the United States, Europe and other developed countries. In particular the elements and stages of implementing SCM and evaluating the effectiveness and implications of SCM instruments are explored. This study examines a wide range of issues and problems that the SCM model might encounter. The application of the concepts of environmental management and corporate social responsibility is analyzed at local and regional levels since this is a relatively new field of research. In addition, this thesis stresses the growing importance of social issues specific to this region, which the literature shows should not be ignored.

This thesis studies current supply chain practices in the petroleum downstream industry of USA, using ExxonMobil as a case study. Based on the analysis of the literature and the interaction with industry experts, this work describes the main supply chain issues and challenges in the downstream sector. Moreover, supply chain strategies used by different players in the industry are studied, analyzing in particular the progressive but slow shift of the industry towards a holistic supply chain view. Finally, ExxonMobil operations are used as an illustration of several aspects of the previous general analysis. The first objective of this work was to perform an industry overview, covering the internal and external factors influencing the industry of petroleum downstream. The analysis is focused on supply chain past and current practices. Secondly, a case study about one of the main players in the industry, ExxonMobil is presented.


The focus of this work is to perform early planning and decision-making for a petrochemical plants network for maximum economical gain, minimum risk to people from possible chemical accidents and minimum environmental risk.

This study, which is concerned with economic and risk objectives, leads to the identification of important factors that affects the building-up of Environmental Management System for Petrochemical Industry. It uses modeling, optimization tools, economics, safety and environmental risk assessment concepts for Development of this Environmental Management
System. Consequently, the study develops a model that translates the network of the petrochemical industry into mathematical relations and plans for the projected development in Kuwait petrochemical industry as a case study. The Research Work uses a Mixed Integer Programming model to select the routes from the basic feedstock available in Kuwait to the desired final products with the objective function of some sustainability elements, namely, economics, safety and the environment.


This Research Focuses on the Strategic Location of Oil Refinery For Optimum SCM of Petroleum. The problem that is tackled in this thesis is that of developing a model for refinery location selection. A multistage multi-factor model using weighted ranking has been developed for this.

The Thesis presents the case study of ‘Kochi Refinery Limited’ and studies it’s inbound, internal, and outbound logistic system. Bottlenecks, excess capacity, and other related problems are discussed in detail. Recommendations for solutions to some of the identified problems are also given in this thesis. The attempt in this thesis is therefore to look at refinery supply chain problem in totality from locations planning to operations and to solve the relative problems.