

Abstracts of papers presented at the 14th International Symposium on Logistics (14th ISL)

Global supply chains and inter-firm networks

Istanbul, Turkey - 5-8 July 2009



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INTRODUCTION

We would like to welcome our friends and colleagues to the annual International Symposium on Logistics (14th ISL). It is 16 years since the first symposium on Logistics was held in Nottingham in 1993 and has now become a regular, well-established and premier international event in the field of Logistics and Supply Chain Management. As always many members of the ISL community look forward to meeting, sharing and exchanging their research ideas and results in both a formal and informal setting which the symposium provides. The ISL series continues to grow in strength and stature in terms of contributions made by the participants to the field of Logistics and Supply Chain Management. Similarly, the concept of alternating the symposium every year between Europe and the rest of the World is now well established. To date this event has successfully been held eight times in Europe (Nottingham, UK 1993 and 1995, Padua, Italy 1997, Florence, Italy 1999, Salzburg, Austria 2001, Seville, Spain 2003, Lisbon, Portugal 2005, Budapest, Hungary 2007) and four times outside Europe (Iwate, Japan 2000, Melbourne, Australia 2002, Bangalore, India 2004, Beijing, China 2006 and Bangkok, Thailand 2008). This year's event in Istanbul, Turkey continues with the tradition following the very successful and productive event held in Bangkok last year. As usual ISL 2009 brings together leading academics, researchers and practitioners to exchange ideas, views and the latest research in the field of Logistics and Supply Chain Management.

The theme of this year's 14th International Symposium in Logistics is "**Global supply chains and inter-firm networks**". This theme capitalises and builds upon the papers presented during the previous ISL events. It also represents an emerging and highly challenging area of research and practice for both academics and practitioners alike, considering the current global economic uncertainties and downturn in the global manufacturing and services sector. Against this backdrop there is an emerging consensus that reliance on efficient and responsive supply chains which are underpinned by robust yet flexible inter-firm networks is the key to future survival and long-term prosperity of firms. The current industrial context is characterised by volatile global competitive environment, shortening product life cycles, flexible and distributed manufacturing, increased levels of global outsourcing, networked organisations, higher levels of economic uncertainties and, above all, customers, who are demanding higher levels of service. This means that the challenges to supply chain management have never been greater. In our view the 14th ISL in Istanbul represents a timely opportunity for academics and researchers to address pertinent issues surrounding logistics and supply chains within a global context. Turkey is a country that has a rich history and culture and is ideally positioned as a natural bridge between Europe and Asia. We are optimistic that this year's event provides an opportunity to address some of these issues and challenges.

Potential authors were invited to submit an abstract to the Symposium Chairmen. All abstracts were reviewed by two experts from the International Advisory Committee and final papers were further reviewed by an International Panel of Reviewers. As a result papers are included in this volume with 214 contributing authors coming from 28 countries. This book of proceedings has been organised according the following categories:

- Supply Chain Management
- International Supply Chain Networks
- Supply Chain Performance Assessment
- Global Outsourcing
- Logistics Planning and Control Models
- Inventory Management
- Decision Support Systems and Communication Technologies
- Logistics in the Service Sector
- Environmental Logistics
- Distribution and Third / Fourth Party Logistics
- Reverse Logistics
- Organisational and Managerial issues in Logistics

We would like to take this opportunity to express our sincere thanks to all the presenters, delegates, reviewers, Advisory Committee members, local organisers especially Sinan Yener, Yigit Oztriryak, Tamer Ovutem and guest speakers for their interesting and valued contributions.

Finally, our very special thanks go to Alison Parrett for her wonderful all round administrative support throughout the entire organisation often under stressful, demanding and unpredictable circumstances.

Professors Kulwant S Pawar, Chandra S Lalwani, Moreno Muffatto and Bülent Çatay – July 2009

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SECTION 1 – Supply Chain Management

A TAXONOMY OF SUPPLY CHAIN MANAGEMENT FUNCTIONS? A SYSTEMIC-CONSTRUCTIVIST PERSPECTIVE ON LOGISTICS VS. SCM

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Purpose of this Paper

Although recently a number of attempts have been made to clarify the domain and scope of research in SCM and 'related' research areas, neither a consensus, nor a solution to the 'who owns whom' question does seem to emerge (cf. Mentzer et al., 2008). This paper intends to contribute towards a solution of this debate by *defining* and *delimiting* research objects in the field of logistics and SCM.

Research Approach

In comparison to former studies, we do not employ narrative literature reviews or interview experts in order to *review* or *describe* the debate and potential solutions. We take a systemic-constructivist perspective to *define* and *delimit* the different research areas by their respective least common denominator implicitly agreed on in past literature. Thereby, we are able to abstain from current epistemological discussions and existing attitudes towards the role or definition of SCM and related areas.

Findings

Logistics presents itself as a three-layered system: (i) a self-referential, autopoietic (i.e. a living) organisational system (cf. Luhmann, 2006) that decides about the movement and non-movement of objects; (ii) an autopoietic system that operates by the differentiation of movement and non-movement; and (iii) an allopoietic deterministic system (an infrastructure) on which the logistical system operates. All three layers are embedded as a functionally differentiated subsystem in organisations.

SCM instead presents itself—at least—as a two-layered system: (i) an autopoietic organisational system that decides about integration and disintegration; and (ii) an allopoietic deterministic system (e.g., an IT system) that enables or is required for integration to happen. Both layers are embedded as a functionally differentiated subsystem in organisations or meta-organisations. Thus, from the systemic-constructivist perspective there is strong evidence to suggest that logistics and SCM emerge as two autonomous and functionally differentiated subsystems in organisations. Defining SCM as the difference of integration/disintegration and not as the difference of movement/non-movement, clearly delimits SCM from logistics. Therefore, logistics and SCM are (or ought to be) two distinct areas of study.

Value of Paper

By taking a systemic-constructivist perspective on the domain and scope of research in 'the field', we can clearly define and delimit what research in logistics and SCM—as well as in any 'related research areas' or 'foundational disciplines'—ought to focus on: Those operations that do maintain the systems' respective system/environment difference. Each area addresses distinct issues and research should thus be clearly separated. Still, the mutual dependencies need to be kept in mind, since the systems are structurally coupled to each other. However, any hierarchical classification, question of 'ownership', or similar subordination appears from this perspective as unnecessary—if not nonsense—because the systems cannot be determined by other systems, but may change due to perturbations caused by the other systems in their environment (or organisation). Therefore, SCM should only be considered as an interdisciplinary research area that may (and usually does) affect and may be affected by other (research) areas, but that cannot determine those in the sense of being superior.

Luhmann N (2006) System as difference. *Organization*, 13(1), 37–57.

Mentzer JT, Stank TP, & Esper TL (2008) Supply chain management and its relationship to logistics, marketing, production, and operations management. *JBL*, 29(1), 31–46.

SIX PATHWAYS TO ACHIEVING A SEAMLESS SUPPLY CHAIN

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ABSTRACT

Many academics report that supply chain excellence is still rare, and that guidance is missing on how supply chain integration is achieved in practise. A conceptual model has been developed presenting six distinct pathways to supply chain integration. This exploratory research utilised four longitudinal case studies to test the developed conceptual model. The findings highlight that the pathway to supply chain integration is indeed not a single. Companies are taking various, organizational specific, roots to achieve the seamless supply chain.

IMPLEMENTING LEAN-FLOW IN AN AEROSPACE SUPPLY CHAIN

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ABSTRACT

This empirical paper discusses the application of the Flow Accounting methodology for the design and implementation of a pull-system in an aerospace supply chain that is based upon the Drum-Buffer-Rope approach derived from the Theory of Constraints. This applied research project was derived from the PreMade programme of work and was designated 'Workpacket 3' (WP3). The focal case involves a fabrication facility responsible for producing aircraft fuselage and nacelle panels and which is characterised by many shared and natural batch resources. The resultant pull-system design is explained, as are the initial results from the implementation of this design.

Suggested Topic Area: Design And Organization of Supply Chains,
Supply Chain Dynamics and Inventory Management,
Supply Chain Performance Assessment

Key Words: Lean, Flow, Theory of Constraints, Aerospace

NEED FOR SPEED: THE ANTECEDENTS OF SPEED-TO-MARKET IN SUPPLY CHAINS

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ABSTRACT

The concept of speed-to-market has received much attention from industry and academia for the past two decades. It has been recognized that time-to-market plays an important role in determining the ultimate success or failure of a new product launch. Despite its importance, past research largely focus on speed-to-market in the new product development process, while the role of supply chain management in improving speed-to-market for existing products has largely been ignored. In this paper, we attempt to shed some light on the behaviour of speed-to-market from a supply chain perspective. Specifically, we focus on speed-to-market in a dyadic buyer-supplier relationship. Traditionally, companies persistently aim at greater speed and cost-effectiveness, which are popular grails of supply chain management. Very often, companies have to trade-off between cost and speed. While recognizing the traditional research on speed and cost trade-offs, we address the behaviour of speed-to-market in supply chains from a relational perspective. We posit that trust and frequency of communications are two key antecedents of speed-to-market, and frequency of communications is affected by trust and power. We used a questionnaire to survey the professional opinions of our respondents. The questionnaire was developed based on existing measures in the literature. A large-scale mail survey was conducted and 198 complete and usable responses from more than ten industries were collected. The results in structural equation modelling generally support our hypotheses. Theoretical and practical contributions are shared and documented in this paper.

Keywords: Supply chain, speed-to-market, trust, frequency of communications.

'SUPPLY CHAIN VOIDS (SCVS) WITHIN THE FINANCIAL INTERMEDIATION AND INSURANCE SECTOR IN WALES. FACT OR FICTION?'

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ABSTRACT

The research into supply chain voids (SCVs) in capability within Wales was described by Whitehead and Found (2007) where SCVs were defined in relation to the study region and initial research findings were reported; identifying three sectors within which to carry out case studies into specific SCVs. This paper furthers this work and reports on the results from one sector, specifically, financial intermediation and insurance.

Purpose of this paper

The study, part of a PhD thesis, investigates SCVs within the supply chains of regionally based customers. Ultimately, the research develops a framework for use by the Welsh Assembly Government (WAG) to address SCVs in the future. This paper covers the case study stage for the financial intermediation and insurance sector whilst addressing the research question:

'What supply chain voids in capability exist in three of the priority sectors in Wales and why?'

Methodology

A multi-method case study strategy has been adopted utilising semi-structured interviews, structured telephone interviews and standard business strategic analysis techniques such as PESTEL, SWOT and TOWS (Yin, 2003; Bryman and Bell, 2003; Denzin and Lincoln, 2000; Saunders *et al.*, 2003; Johnson *et al.*, 2006).

Findings

This case study identifies that a combined total of 41 SCVs exist, with the top 5 accounting for over £400m that is being leaked from the Welsh economy. The majority of SCVs are perceived to exist because of a lack of local supplier availability, technical competence, quality and required service levels. Further, the study identifies that specific sector strategies are required.

Research Limitations/Implications

Limitations include the centricity of the study region, the focus on priority sectors thereby ignoring others, the lack of available data on all sectors, reliance on WAG data which was incomplete or out of date. These were countered by consulting other regional development agencies (RDAs) regarding SCV problems, using the literature where possible to source data to triangulate that from WAG and the Office for National Statistics (ONS) and updating company data using their web sites. Future research into SCVs could investigate other sectors in other regions whilst applying the proposed framework.

Practical Implications

The WAG now has detailed information regarding SCVs in this sector, why they exist and how they may be addressed plus the PhD research has aided the development of a framework for potential use by WAG.

Originality/Value of the paper

This is a multi-disciplinary study including literature from purchasing and supply chain management, economics and economic geography. Few academic studies have focused on reporting the mechanisms or models employed to identify and respond to SCVs that may exist, although Crone (2002) identifies potential policy interventions for RDAs to consider in relation to addressing weak supply linkages.

This research is appropriate to academics, practitioners and policymakers.

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SUPPLY CHAIN MANAGEMENT: HOW TO STEP FROM LEAN TO BEYOND-LEAN APPROACH

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ABSTRACT

In this paper we analyse the Beyond-Lean paradigm as a way for companies to face turbulent environment. The most important strategic drivers are depicted as a starting research point to support companies in the implementation of a dynamic model to improve their performance working in networks for the production of high-value-added products to face current market competition.

NEXT GENERATION MANUFACTURING SUPPLY CHAINS: ISSUES AND CHALLENGES

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ABSTRACT

Purpose

Recent developments in global supply chains, outsourcing and multi-channel distribution have generated renewed need for characterising and defining supply chains of the next generation. This need is especially important for strong and growing supply chain partnerships such as those between UK and India. The NEX-GEM project¹ is undertaken by a consortium of universities and industries in the UK and India to create a collaborating environment to share and exchange the latest and emerging developments in concepts, methodologies and tools to support "Next generation supply chains". In this paper, we analyse the results of data collected in two NEX-GEM workshops held in Bangalore and Bangkok, and the responses of a subsequent questionnaire survey.

Design/methodology/approach The workshop in Bangalore involved a brainstorming session on issues affecting next generation supply chains between the UK and India and was attended by about twenty one senior and middle level managers working in operations/marketing/supply chain areas from leading industrial establishments in and around Bangalore, and also participants from the academia. The workshop in Bangkok involved a similar brainstorming session, and participants comprised academic community across the globe that attended the International Symposium on Logistics.

Findings Though the composition of participants in the two workshops differed widely, and many of the respondents of the questionnaire survey were not part of the two workshops, there was a significant similarity among the issues highlighted in the workshops and questionnaire survey. Important issues identified included green and environmental issues, role of digital capability and IT, cost issues, human issues, demand management issues, and risk management. These are discussed in more detail in the paper. Our findings are similar to those reported in the literature.

Value This paper reports the expert opinions from practitioners as well as academia on the future of supply chain management using custom designed workshops. The results are of value to policy makers in shaping up the future supply chains, especially those across nations.

CATEGORY: Research Paper/Case Study

¹ The NEX-GEM project titled "Next Generation Manufacturing Supply Chains and Digital Economy Research Collaboration" is funded by the Engineering and Physical Sciences Research Council (EPSRC), UK. NEX-GEM partners are University of Hull, University of Nottingham, University of Loughborough and Brunel University in the UK and IIM Bangalore, IIT Mumbai, IIT Kharagpur and IIM Calcutta in India. Further details are available at the NEX-GEM website: <http://www.nex-gem.co.uk/>.

SUPPLY CHAIN AND LOGISTICS APPROACHES TO SERVITIZATION IN THE AEROSPACE MANUFACTURING INDUSTRY: A CASE STUDY APPROACH

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ABSTRACT

In industries such as aerospace manufacturing, some companies have pushed SC integration to the highest level, operating their SCs in a highly collaborative fashion. By forming Extended Enterprises, aerospace companies aim to differentiate themselves, reap the benefits of reduced lead times and costs and enhance collaborative development of new products and associated aftermarket services. As a result, leading Original Equipment Manufacturers (OEMs) have offered a hybrid leasing option, where instead of purchasing, the customer pays for use of the product per hour of use. This servitization-based approach creates an integrated product/service mix that has to be supported by the SC network, imposing a novel set of challenges on both the upstream and downstream aspects of the Logistics function: indeed, lead times for maintenance processes and associated aftermarket component supply become key issues for success of the business model. With the help of a case study, this paper explores these issues and develops understanding of the SCM and Logistics challenges in delivering such integrated offerings. The case company is a leading manufacturing OEM in the civil aerospace industry and a market leader in the hybrid leasing offering within its sector. Interviews with key SC and Logistics managers in the company provided primary data.

The purpose of the paper is to explore and evaluate the logistics approaches currently followed within the case company, and to indicate the challenges and opportunities faced in terms of Logistics when a company operating within a highly integrated global SC develops new service offerings.

KEYWORDS

Servitization, Logistics, Supply Chain Management, Aerospace Industry

SECTION 2 – Supply Chain Inter-Firm Networks and Collaboration

AN OPERATIONAL PERSPECTIVE TO BORDER MANAGEMENT REFORM

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ABSTRACT

Purpose: Border management reform and trade facilitation are topics of growing interest in international trade policy, development aid, trade and customs moderations, and supply chain security. Much of the international debate is focused on the implementation of international trade facilitation recommendations and instruments. This paper introduces the operational perspective as an alternative source for border reform stimulus.

Design / approach / methodology: The paper builds on the author's first hand practitioner experience as Deputy Director at SITPRO (the UK trade facilitation agency) and Secretary at EUROPRO (the umbrella body for European trade facilitation bodies). It also integrates various pieces of commissioned work and academic research by the author into one concept paper.

Findings: The author argues that despite the current policy momentum, the interests of actors, institutional limitations, and lack of knowledge constitute formidable obstacles to border management reform.

Research limitation / implications: Although border management reform and trade facilitation are now established agenda items in trade and customs policy circles, the topic remains under-researched. The paper hopes to raise awareness about the topic and stimulate academic enquiry.

Practical implications: Active academic enquiry can help overcome the lack of knowledge, one of the main obstacles to border management reform and trade facilitation.

What is original / value of paper: The paper proposes an operational perspective to border management reform, which currently is predominantly described in terms of international trade facilitation recommendations.

Keywords: Border management reform, trade facilitation, operational perspective

MOBILISING KNOWLEDGE ACROSS ORGANISATIONAL BOUNDARIES: ADDRESSING HUMAN ISSUES IN THE TELECOMMUNICATIONS INDUSTRY

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ABSTRACT

This paper explores how knowledge sharing and transfer occur when developing new products within the extended enterprise. The benefits of implementing Knowledge Management (KM) strategies have been proven but research to date has largely focussed on technology as a solution to KM issues. This study focuses instead on exploring the softer, human issues within KM. Working together with European-based companies and research institutions, we sought to address the gaps in KM research with respect to these human-centred issues. The results are based on interviews and workshops conducted with European managers that specifically address KM within the Telecommunications industry (TLC). The main human barriers identified were language, international differences, accuracy and reliability of knowledge, protection of proprietary knowledge, maintenance of communication channels, lack of time, fear of penalties, fear of losing profile and market position. A framework is proposed that seeks to assist in addressing such barriers in an inter-organisational knowledge management context. In order to operationalise the framework we suggest that performance metrics should be implemented at each hierarchical level. Furthermore, to ensure that the knowledge remains mobilised, additional incentives such as Communities of Practice (COPs) should be encouraged. This framework, together with the suggested measures and implementation methods, paves the way towards developing practical solutions for ensuring a sustainable knowledge management culture within organisations.

COLLABORATIVE SUPPLY NETWORK MANAGEMENT IN THE COMPETITIVE ENVIRONMENT OF THE MUSIC INDUSTRY - AUTONOMOUS CO-OPERATION AS AN ORGANISATIONAL PRINCIPLE IN NON-PHYSICAL PRODUCT LOGISTICS

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ABSTRACT

Purpose of this paper

The supply chain management of non-physical music products in the music industry was characterised in the recent past by long lasting licensing processes between record companies and online-retailers which lead to market inefficiencies. Therefore, the question that is addressed in this conceptual paper is how these licensing processes can be modified in order to prevent the market from future inefficiencies and to exploit the full potentials resulting from the possibilities to distribute non-physical music products over the Internet.

Design/methodology/approach

The paper presents characteristics of non-physical product logistics in the music industry and outlines associated problems regarding its efficiency. The concept of coopetition is used to show potentials that arise from inter-relations between complementors in and for the music industry. Furthermore, the organisational principle autonomous co-operation is used to illustrate possible contributions as well as limitations for an appliance in the licensing processes of non-physical music products.

Findings

One possibility to exploit potentials arising from the non-physical music product market is to cooperate with actors that can be regarded as complementors. However, processes of identifying these complementors, estimating associated added values of a participation in a co-operation and negotiating with each other can lead to long-lasting licensing processes between record companies and potential online-retailers, which, in turn, lead to market inefficiencies. One possible approach to shorten these processes is to increase the degree of autonomous co-operation in the supply chain management of non-physical product logistics. This would increase the overall information processing as well as decision-making capacities, which might affect the efficiency of licensing processes positively.

Research limitations/implications

Further research is required on the one hand concerning possibilities to evaluate individual degrees of autonomous co-operation with regard to the individual competencies of the involved actors in order to find the individual optimum degrees for the constitutive characteristics. On the other hand research is required concerning possibilities to equip single systems' elements with the needed competencies to render decisions themselves. Furthermore, empirical research would be necessary in order to proof the validity of the findings.

Practical implications

The supply chain management of non-physical product logistics should consider an increase of autonomous co-operation in their licensing processes, but should be aware of doing so without equipping the single deciding elements with the needed competencies.

What is original/value of paper?

Approaching new organisational principles like autonomous co-operation in a theoretical research to the supply chain management of the music industry; more specifically, to the licensing processes of record companies to online retailers, might be of value for record companies that are faced with long-lasting licensing processes and resulting losses of market potentials. It might give new insights regarding positive as well as negative effects of approaching new organisational principles that reduce hierarchies within companies.

Acknowledgement: This research was supported by the German Research Foundation (DFG) as part of the Collaborative Research Centre 637 “Autonomous Cooperating Logistic Processes – A Paradigm Shift and its Limitations”.

REQUIREMENTS AND APPROACHES FOR A COMPLEXITY SCIENCE-BASED MODELLING OF INTERNATIONAL SUPPLY NETWORKS - LESSONS LEARNED FROM FINANCIAL MARKET MULTI-AGENT MODELS FOR THE SIMULATION OF COMPLEX ADAPTIVE LOGISTICS SYSTEMS

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ABSTRACT

Purpose of this paper

Logistics systems increasingly have to cope with new challenges due to changing customer demands, technologies, and ecological awareness, whereas the challenges' consequences might be unknown. Hence, a modelling concept is needed to develop and analyze system designs in order to enable the system to react to these challenges by adapting its behaviour. Since current modelling approaches cannot illustrate real market behaviour appropriately, a transfer of an operating stock market modelling approach from LeBaron to logistics systems is evaluated in this **research paper**.

Design/methodology/approach

To analyze the feasibility and contributions of transferring the stock market model to logistics systems, the similarities in the characteristics of both, stock markets and logistics markets, are identified based on the concept of complex adaptive logistics systems. Furthermore, the pre-conditions given by environmental constraints (laws, prohibitions), physical properties of the traded goods (immaterial and material) and the physical constraints in the whole system (limited transportation space) are examined based on a literature review. The relevant factors are listed to create a catalogue of contributions and pre-conditions through or for the modelling of logistics systems.

Findings

Due to the parallels in the characteristics and if the pre-conditions are considered, the transfer of LeBaron's model to logistics systems is feasible and offers some contributions. Hence, the illustration of true market behaviour is enhanced and therewith the system's capability to react on environmental changes in time. By applying new information and communication technologies like RFID or sensor network real logistics systems could possibly be enabled to realize the relevant characteristics.

Research limitations/implications

Further research could focus on the remaining deficits (e.g. true market behaviour not illustratable at adequate quality) to improve the model regarding the desired goals. The next step could be to develop and compute a real simulation model. Thus, the theoretical approach could be tested and verified and potential weaknesses corrected.

Practical implications

Practical implications are that learning features in logistics systems can lead to a higher system flexibility and adaptability and therewith to higher system robustness. Since there are lots of agents, relations, and resulting interactions within a model, the application of new information and communication technologies in order to enable agents to act autonomously is one possibility to implement the characteristics of ISN.

What is original/value of paper?

The main contributions towards two described modelling approaches is the improvement in illustrating the market behaviour and therewith to realize a faster reaction to changes, since the approach explicitly focuses on the characteristics of ISN in order to realize a behaviour as close to reality as possible. In addition, some required pre-conditions are outlined, which have to be considered in the modelling process.

CAN INTER-FIRM NETWORKS ALLEVIATE SUPPLY CHAIN RISKS WITHIN GLOBAL FOOD SUPPLY CHAINS?

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ABSTRACT

Purpose of this paper

When considering the recent cases of food contamination and the percolation of the risk across national boundaries through the supply chain, the research questions that arose for this study were:

- (1) Can inter-firm networks alleviate supply chain risks within global food supply chains?
- (2) What are the factors that impact inter-firm networks?

Design/methodology/approach

In order to explore the research questions, a literature review was conducted on inter-firm networks and food supply chains. Also, the literature surrounding the recent food contamination cases was analysed using grounded theory principles to identify themes impacting inter-firm networks.

Findings

The research identified that for inter-firm networks to work in managing and mitigating food supply chain risks the factors to consider are: Trust and Governance. These have to be supported by the appropriate Internal Controls which will eventually lead to a good Supply Chain Relationship. Inter-firm aspects specifically in terms of relationships, trust and governance are analysed and a conceptual model for mitigating risk is derived out of the above.

Research limitations/implications

The research has focussed on literature and case examples derived from literature sources. The next phase of the research will endeavour to operationalise the links and empirically test out the factors for their strength in alleviating food supply chain risks.

What is original/value of paper

Food safety has been in the news quite a number of times recently with cases of food contamination ranging from tomatoes and peppers being recalled across North America due to a salmonella scare, the Chinese milk contamination and the recent case of salmonella detection in peanut butter in North America, all of which have affected entities across the national borders. This highlights not only the high interlinking of the food supply chains but also the vulnerability of such chains. The concept of inter-firm network is considered for managing food supply chain risks.

SECTION 3 – Supply Chain Performance Assessment

THE ROLE OF TRUST AND TECHNOLOGY ON COLLABORATION AND SUPPLY CHAIN PERFORMANCE

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ABSTRACT

Purpose of this paper

The purpose of this paper is to examine the relationship between trust and technology in achieving collaborative supply chain partnerships and the impact of collaborative supply chain partnerships on supply chain performance.

Design/methodology/approach

A conceptual framework identifies the roles of trust and technology in achieving collaboration and supply chain performance. For the purpose of this study three hypotheses were developed and tested with a survey sample of 81 buyers of retail convenience stores and suppliers of FMCG goods.

Findings

The Findings suggest that trust and technology have strong relationships with collaboration while collaboration has a moderate relationship with supply chain performance.

Research limitations/implications (if applicable)

This study is limited to the retail industry.

Practical implications (if applicable)

This paper will enable the retail industry practitioners understand how collaboration can be managed and how a better collaboration enhances better supply chain performance

What is original/value of paper

This study provides insights into why trust and technology are important in the retail and FMCG business sectors.

Paper Type: Research Paper

LOGISTICS BENCHMARK STUDY OF THE EAST WEST ECONOMIC CORRIDOR

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ABSTRACT

Purpose: The objective of this manuscript is to evaluate and benchmark the logistics potential for each country along the East West Economic Corridor (EWEC) in order to develop appropriate logistics facilitation policies. The countries on the corridor are Myanmar, Thailand, Lao PDR and Vietnam.

Methodology: A macro logistics evaluation model based on an in-depth understanding of the "AS IS" situation of the logistics system (Banomyong, et al, 2008) of the EWEC is used to measure the current situation of four key logistics related dimensions which are infrastructure, the institutional framework, service providers and traders/manufacturers.

Research Implications: Policy recommendations will be developed to improve the logistics integration of the EWEC.

Research Limitations: This study is a policy research study based on secondary data and a single case study to illustrate the logistics performance of the EWEC.

Original contribution: There are not many logistics related studies on national or regional logistics development. The manuscript proposes a methodology to assess and compare national logistics system and corridor performance. The results can be utilised in the formulation of logistics development policy.

Key Words: Logistics development policy, performance assessment, benchmarking, international comparisons

SUPPLY CHAIN INTEGRATION, ITS ANTECEDENTS AND CONSEQUENCES

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ABSTRACT

The purpose of this research is to test the mediating effect among antecedents of internal and external supply chain integration as well as among integration, production performance and firm performance. Although several studies have investigated correlations between these variables, they have mainly focused on the direct relationships. Therefore, this study examines the mediating effect on these variables. Particularly, it tests the mediating influence of internal trust and internal conflict on the correlation between internal communication and internal integration between production and purchasing departments within companies. Similarly, the research examines whether external trust and external conflict mediate the effect of external communication on external integration between a company and its suppliers. Finally, it also investigates whether the relationships between internal and external integration and firm performance are mediated by production performance.

The data was collected by questionnaire. In total, 261 completed questionnaires were received from production managers. The findings predominantly support the research hypotheses. This study expands the literature by examining the mediating effects of antecedents on supply chain integration as well as this kind of effect between supply chain integration and firm performance by functional performance. Furthermore, this research also helps managers understand more the relationship among factors and the way these factors affect supply chain integration and firm performance.

Keywords: Supply chain management, integration, antecedents, firm performance.

COMMUNICATING CREDIBLY SUPPLY MANAGEMENT'S VALUE CONTRIBUTION: ASSESSING FINANCIAL PERFORMANCE MEASUREMENT IN FRAGMENTED RELATIONSHIPS

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ABSTRACT

The obligation of Purchasing and Supply Management (PSM) in a firm is to integrate external with internal value creation (Chen et al., 2004; Ellram et al., 2002; Narasimhan & Das, 2001). Since transformation activities at manufactures are constantly decreasing (Gadde & Håkansson, 1994), the contribution of PSM to a firm's overall performance gets more and more important. This increased importance of PSM in today's enterprises calls for a stronger recognition of PSM's strategic relevance and a more performance oriented management of the function (Axelsson et al., 2002).

Although fundamental operational problems of measuring PSM's performance-like clearly defining cost savings-remain unsolved (Nollet et al., 2008), the major part of the PSM literature stays on a conceptual level. Furthermore, the traditional financial performance measures currently used in PSM seem to fail to communicate credibly PSM's value contribution to a firm's overall performance. Therefore, PSM is not seen as a strategic contributor or equal partner by other entities of a firm (Tassabehji & Moorhouse, 2008)

In our paper, we link this credibility problem with general characteristics of PSM. We believe that traditional financial performance measures are inappropriate to account for very basic aspects that lie in the nature of PSM itself. In our paper, we take a closer look on general characteristics of PSM in order to investigate how they hinder current financial performance measures from reflecting PSM's value contribution.

For this purpose, we employ principal-agent theory to access key elements of PSM's organizational embedding that matter for performance measurement. We find three underlying characteristics of PSM that hinder the acknowledgement of its value contribution: (1) Its organizational embedding in fragmented, incomplete relationships with; (2) its high dependence on; and (3) its information asymmetry to other functions. We show that these characteristics lead to doubts on PSM's performance reports due to a lack of observability and verifiability of the contribution; controllability problems concerning the origin of contributed value; and to an isolation of PSM from corporate strategic and financial planning procedures.

All in all, we introduce a new perspective on measuring PSM's performance, shedding light on general characteristics and the problems it causes when performance measurement is not adjusted to it. Despite our focus on PSM, the results of our research apply to all functions in comparable organizational embeddings, e.g. to logistics.

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DEVELOPING A SUPPLY CHAIN PERFORMANCE MEASUREMENT SYSTEM: CASE STUDY OF DAMIETTA PORT IN EGYPT

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ABSTRACT

Seaports compete through high quality services, reducing operating expenses, developments in port infrastructure and effective port performance. Port managers aim to meet the satisfaction and expectations of both ship owners and cargo owners. Port clients require high quality service standards, reduced ship-turn around times in ports, reliable and proper cargo handling equipment, available storage areas with relevant capacity, reduced cargo dwell time, appropriate facilities at terminals and in-port transportation infrastructure. In order to achieve such requirements, the operations on a daily basis have to be effectively controlled. Port assets should be economically utilised and cargo dwell times have to be reduced. There are many variables that have a great impact on port performance. A reliable supply chain performance measurement system needs to be developed to represent the actual port performance. Within this research regression analysis will be conducted in order to develop a more customised and effective port supply chain performance measurement system in Damietta port of Egypt. Multiple regressions have been developed using key variables and indicators used in daily port operations.

Key Terms: port performance measurement – ship turn-around time – total cargo dwell times

MODELLING PERFORMANCE MEASURES FOR SUPPLY CHAIN SYSTEMS USING DISCRETE EVENT SIMULATION

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ABSTRACT

Performance measures are designed and modelled within a supply chain to evaluate and control its efficiency and effectiveness. This paper aims to emphasise the modelling aspects linked to performance measures intended for simulated supply chain systems. Literature concerning simulated supply chain models and the performance measures used is provided here. The paper also captures a critical discussion concerning issues linked to the aggregated performance measures. A simulation model is developed here which represents a multi-echelon supply chain. The model analysis focuses on evaluating the way in which performance measures can be built when simulation is used.

INTER-FIRM PERFORMANCE FOR GLOBAL NETWORKS: AN OPTIMISATION MODEL USING DATA ENVELOPMENT ANALYSIS

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ABSTRACT

Competitiveness in the global market requires efficiencies to improve the performance across the whole supply chain of inter-connected firms. Competitive and adversarial relationships in uncoordinated supply networks have traditionally impeded the improvement of performance. Hence the adoption of management techniques, that regard inter-connected firms (ICF) as integrated inter-firm networks (IFN), needs to be expanded for improved performance. An optimisation technique for determining performances and metricating their efficiencies on the basis of Pareto optimality is Data Envelopment Analysis (DEA). Despite DEA's diverse and widespread application, its potential for supply chain networks has not been fully explored. This paper proposes an optimisation model that measures performance in an inter-firm supply chain, in particular the efficiency of inter-firm collaboration. The algorithm requires that 'decision making units' (DMUs) are the inter-connected dyads of firms in the network which can be assessed comparatively to one another and ranked against the best performers. This paper therefore makes an original contribution to the study of supply chain management by providing an optimisation model to assess the effectiveness of inter-firm networks.

Keywords: Inter-Firm Networks (ICN), Performance Optimisation, Data Envelopment Analysis (DEA)

AN IMPORTANCE-PERFORMANCE ANALYSIS FOR SUPPLIERS ASSESSMENT IN FOREIGN-AID FUNDED PROCUREMENT

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ABSTRACT

Purpose - The supplier assessment process and the supplier assessment criteria used by the organisational buyers are considered critical elements for suppliers' choice process. However, little attention has so far been given for supplier assessment in foreign-aid funded procurement in the context of developing countries. Using a sample of Executing Agencies (EAs), Donor Agency Executives (DAE) and Supplying Organisation Executives (SOE) this study identified the supplier assessment criteria and their relative importance in foreign-aid funded procurement in Bangladesh. It also assessed the extent of match between buyers' requirements and suppliers' performance.

Design/approach/methodology - An instrument with 32 seven-point (1- rarely, 7 mostly) Likert scaled items was employed to gather data on the level of importance assigned by both buyers and suppliers on each item. In this study EAs and DAEs represent buyers, whereas SOEs represent suppliers. The importance-performance matrix (IPM) analysis was conducted to assess the gap between what is required by the buyers and what is provided by the suppliers, and to categorise the assessment items into four categories such as 'low priority', 'possible killer', 'concentrate here', and 'keep up the good work'

Findings - The results indicate that to provide better service suppliers must assign tasks to the knowledgeable sales personnel, provide better warranties with well-known branded products, and at a reliable quality level. The supplier organisations should organize a high caliber management system so that they are capable of providing services without constant follow-up by the buyers and response to buyers' enquiries promptly.

Originality/value - The results of the study could be adopted to design supplier assessment procedure in other developing countries.

Key Words - Assessment criteria, Developing country, Foreign-aid funded procurement, Importance-performance matrix.

Paper Type - Research paper.

SECTION 4 – Risk and Visibility

VULNERABILITY IN UK FOOD SUPPLY NETWORKS: THE IMPACT OF GLOBAL EFFECTS

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ABSTRACT

UK food supply chains are increasingly exposed to global effects and trends. While these external factors have the potential to create new sources of risk and uncertainty, there have been very few studies in this area. As part of a project commissioned by Chatham House, this study examines the likely impacts of global uncertainties on the UK wheat and dairy supply networks. It concludes that future resource constraints, concerns over sustainability, global market volatility, higher input prices and increased exposure to crisis-led events are potential future points of vulnerability, particularly for the dairy sector. Questions over system capability and resilience in light of these uncertainties raise future implications for supply chain risk management.

DEVELOPMENT OF KNOWLEDGE BASED SYSTEM FOR RISK IDENTIFICATION FOR MULTI-PARTNER MANUFACTURING SUPPLY CHAINS

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ABSTRACT

Nowadays Supply Chain (SC) networks are operating in an ever more complex and dynamic environments which is mainly due to the fast development in technology leading to the development of complex products and services, E-business and outsourcing practices. Tough business competition forces SC networks to implement several manufacturing approaches as an effort to operate in more efficient forms. As a result, supply chains have become more vulnerable to disruptions as SC network complexities and interdependencies increase the level of risks that organizations may get exposed to.

Supply chain risk management (SCRM) is aiming at reducing SC network susceptibility, with risk identification as its most important step. However, a specific tool is required to help organizations identify risks due to broader range of risk sources as the network gets more complex. This research aims to develop a model for assisting risk identification in a global manufacturing SC network by utilizing Knowledge Based System (KBS) approach. Accordingly, a Knowledge Based Supply Chain Risk Identification System (KB-SCRIS) is under development to support manufacturing organizations by giving recommendations about potential risks and their interactions with each other.

MANAGING RISK IN INTERNATIONAL INBOUND SUPPLY CHAINS

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ABSTRACT

Purpose of the paper

Managing risk has emerged as an issue of critical importance for today's globalised supply chains. In fact, in global sourcing contexts increased distances between sources of supply and final markets add uncertainty to supply continuity through longer and more variable lead times. Therefore, the aim of this paper is to study how a company can reduce its inbound supply risk, by employing specific strategies.

Methodology

A set of strategies, including both contingency plans and mitigation actions as well as operational buffers, are proposed in order to manage the areas of vulnerability of the inbound supply process. To compare these approaches we propose a simulation-based framework, able to estimate their expected impact on the supply lead time and the overall logistics cost. This framework has then been tested on a real case study.

Findings

This paper provides a useful identification of strategies able to lead to an improvement in the supply chain risk management process in global sourcing. Furthermore, the simulation-based framework contributes in assessing the efficiency and the effectiveness of the proposed strategies.

Research implications

The study attempts to support the quantification of the effectiveness and efficiency of possible risk management strategies, thus contributing in the research on the management of risk in global sourcing contexts.

Practical implications

Besides general managerial insights, this paper provides supply chain managers with a tool that could be used to perform an economic evaluation of different strategies for managing risk in their specific business context.

Originality

The paper addresses an identified gap in the literature for supply risk related to the transportation process which, to date, is the most neglected phase in the global supply process. Moreover it considers the integrated adoption of different risk-reduction strategies.

Keywords

Supply Chain Risk Management; Inbound Supply Risk; International transportation; Global sourcing.

Paper Type: Research paper

FRAMEWORK FOR DESIGNING ROBUST SUPPLY CHAINS

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ABSTRACT

Purpose of this paper

Today's business environment and harsh competitiveness force companies and entire supply chains to increase their efficiency as much as possible. As a consequence, supply chains have become highly sensitive to disruptions and less tolerant to deviations in operations, i.e. supply chains have become more vulnerable. Vulnerability of supply chains may result in less consistent supply chain performances and consequently, their competitive power in the market may diminish. In order to maintain stable supply chain performances, it is necessary to design robust supply chains. Although more literature is appearing on this subject, there is a need for an integrated framework to support the analysis and design of robust supply chains. In this paper we present such a framework. We define the concept of robustness, classify sources of (food) supply chain vulnerability, define supply chain disturbances, and classify adequate redesign strategies to achieve robust supply chain performances.

Design/methodology/approach

Based on a review of recent supply chain management literature, we develop a research model that consists of the main research variables relevant to supply chain vulnerability and robustness. Preliminary results or a case study are presented to test and validate the framework.

Findings

Our main findings refer to the developed research model that captures the relevant aspects for the design of robust supply chains. More in particular our work results in a preliminary list of sources of supply chain vulnerability (with special attention to food supply chains) and a generic list of redesign strategies that can be used to reduce disturbances and their impact on supply chain performances.

Research limitations/implications

More research (case studies) is needed to extend and validate the categorisations of redesign strategies and sources of vulnerability. The selection of the most appropriate redesign strategies for disturbances identified in the presented case requires: 1) a deeper analysis of sources of vulnerability and disturbances itself (e.g. duration, time of detection frequency), 2) modelling and quantification of supply chain key performance indicators for alternative supply chain scenarios (i.e. use of alternative redesign strategies) and disturbance levels.

Practical implications

The paper provides a helpful guideline for practitioners from the aspect of identification of sources of supply chain vulnerability, importance of disturbance magnitude and its impact to supply chain performances, as well as insight into adequate responses to disturbances.

What is original/value of paper

Literature provides more and more papers on the subjects of supply chain vulnerability and robustness. However, most of these papers take a disciplinary point of view and concepts that are developed up to now are still in infancy. This paper tries to integrate the findings of many researchers into an integral framework to design robust supply chains and make foundation for design of robust supply chains.

Category: Research Paper

SUPPLY CHAIN RISK MANAGEMENT: A NETWORK PERSPECTIVE

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ABSTRACT

Purpose of this paper. The aim of this paper is to undertake a network perspective for supply chain risk management (SCRM) by reviewing the existing literature on supply chain risk and locating it within the general literature on networks.

Design/methodology/approach Existing research suggests the SCRM to be an integrated process among the supply chains: the literature on networks provides the needed theoretical support for a better understanding of this integration and points out ways of reaping the higher benefits of it.

Findings. The findings suggest that a small network, with a low level of density and a high degree of centrality, is the configuration with the higher level of risk. We posit that a more decentralised network could present lower risks in several regards, such as technological, supply chain, process, demand, and risks of exposition. Firms can, then, consciously manage their networks in order to lower the overall risk level, by using both formal (e.g. control) and informal mechanisms (e.g. emergence). In order to measure the relevant metrics, Social Network Analysis represents one of the several tools that can be used.

Research limitations/implications: This is a conceptual paper, whose findings need to be tested empirically. For instance, longitudinal research could investigate the direct influence of logistics knowledge flows on overall supply chain performance.

The original/value of paper. The value of this paper is to adopt a network perspective to answer the need to integrate risk management along the supply chain, suggesting a tool able to measure network's social dimensions.

AN INTEGRATED APPROACH TO MANAGE RISKS IN THE FAST MOVING CUSTOMER GOODS SUPPLY CHAIN

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ABSTRACT

Purpose: This paper presents an approach for a semi-quantitative assessment of supply chains risks in the Fast Moving Customer Goods (FMCG) supply chain and for the identification of risk mitigation strategies.

Design/methodology/approach: The approach developed is based on a hybrid methodology, combining Dysfunction Mode and Effects Analysis (DMEA) and Quality Function Deployment (QFD) tools. In particular, the DMEA method is first used to identify possible risks and dysfunctions of the supply chain, and to prioritise them based on an estimated expected failure cost. Hence, the customer requirement planning matrix, also known as House of Quality (HoQ), is used to correlate the supply chain risks identified with possible mitigation strategies.

Findings: The presented methodology enables to examine the impact of mitigation strategies, such as technological innovations, process improvements or organizational changes, on different particular supply chain risks and to identify the strategies to be preferred for implementation.

Research limitations/implications: A further task is the validation of the approach through to a real case example, with the aim to assess its applicability. A practical application will also make it possible to adjust specific parameters of the approach and will enable to integrate all levels of Supply Chain Risk Management, namely the operational, tactical and strategic level.

What is original/value of paper: The approach developed serves at least for two main problems of supply chain management. First, it can be used to identify and rank possible risks and dysfunctions related to a given company or supply chain. Second, the methodology serves as a decision making tool to prioritise possible countermeasures for supply chain risks previously identified.

Paper type: Research paper

RESILIENCE IN THE FOOD SERVICE SECTOR SUPPLY NETWORKS

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ABSTRACT

This paper reports on the findings of an investigation into the resilience of the UK's food service sector supply chains. The purpose of the study was to ascertain the current state of continuity planning in the food service sector supply chains. Themes for the wider study included the scope, extent and limitations of continuity planning within individual organisations; the likely impact throughout the sector of widespread potentially disruptive events such as a human flu pandemic; national/international energy or fuel shortages and longer-term questions of sustainability and food security.

The study complements earlier research undertaken by Cranfield University (2006) into the resilience of the UK grocery sector. The research methodology and design involved interviews with over 40 managers from 28 organisations, including some of the country's leading food service and facilities management companies and of some of their largest customers operating in a range of open and closed environments e.g. hospitals, prisons, military bases as well as the finance houses of the City of London and the off-shore oil and gas sector. Other participating organisations included operating companies serving the public directly, such as fast food restaurants, hotels and sandwich bars. Going backwards from the retail/customer interface, the study brings in companies providing wholesale or contract distribution services to food service sector, some food manufacturing companies and their suppliers, and a representative of one of their industry associations.

The study found that the business continuity provision in place in individual organisations was more or less fit for purpose, but that the purposes, drivers and assumptions differed greatly between public and private sector organisations, including those directly adjacent to each other in the supply chains. The central problem is that business continuity planning tended to extend only as far as the ability of an organisation to maintain its own core operations under otherwise normal external conditions. This was the case even for food service provision within some public service organisations with wider civil contingencies responsibilities.

Contingencies based on the ability to overcome disruptive challenges by switching sites or suppliers underpinned most formal planning for the larger businesses. However, some of the largest volume importers and processing companies explained how the recent volatility of food and energy prices had forced many food suppliers out of business. Other food suppliers would usually come forward to pick up the businesses, though they often struggled to muster the additional logistics capacity needed to absorb extra business at short notice. Amongst the smaller businesses informal self-organising locally-based networks could be found providing mutual support. Similar community-based arrangements were described by managers of specialist divisions of large facilities management companies, notably those responsible for vulnerable populations in closed environments (e.g. prisons or off-shore). These managers resisted recent pressure to abandon local suppliers in favour of national sourcing agreements, believing that locally based suppliers were likely to be more reliable in an emergency.

SECTION 5 – Logistics, Planning and Control Models

TRUST AND CONTROL: DEFINING THE RIGHT LOGISTICAL MONITORING

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ABSTRACT

Purpose of the paper

Supply chain management (SCM) relies on the construction of exchange relationships between partners (or stakeholders) “who collectively convert a basic commodity (upstream) into a finished product (downstream) that is valued by end-customers” (Harrison and van Hoek, 2008). The literature points out that to be efficient SCM requires complete trust between these partners. If trust is not present, the supply chain members are in a situation of arm’s-length relationships governed by suspicion. Partners in such a case should be strictly controlled to avoid the spread of opportunist behaviors. Our paper suggests that in real business affairs, trust and control are not incompatible but instead complement each other efficiently to improve logistical monitoring.

Design

We propose an original conceptual framework associating control and trust procedures in the operation of supply chains. This design is derived from the audit and control literature, and from interorganizational management. Our purpose is to demonstrate how trust is established, developed and sometimes disappears; we also demonstrate how trust is frequently coupled with control mechanisms in a situation of information asymmetry. Trust implies the implementation of relational norms based on equity, transparency and reciprocity so as to limit opportunism.

Findings

Our analysis is based on a critical review of recent academic works emphasizing how these works thoroughly explain the way supply chains are organized and monitored. We proceed with an in-depth study of two collaborative techniques developed within supply chains (VMI, CPFR), with the hypothesis that a successful implementation requires a mix of trust and control. VMI and CPFR operate on the basis of sales forecasts jointly developed by a manufacturer and a large retailer in order to plan logistical operations more efficiently. Transparency between partners requires a minimum of trust, without excluding the control of achieved results.

Value

The paper adopts an organizational perspective demonstrating that SCM will be efficient only if the supply chain members adhere to monitoring procedures combining trust and control within “hybrid configurations”. This field is frequently described in interorganizational management but not in logistics management where the tradition is to insist on the control of performance (implementation of indicators, scorecards, etc.). The paper improves on this narrow and finally unrealistic view. We suggest that trust is one element in the creation of a favorable atmosphere for supply chain members to look for collectively more satisfying answers, for example in matters of stock management, transport, etc.

Practical implications

From the managerial angle, it is important to know whether supply chain members need to invest (and up to what level) in supervision systems to monitor their partners’ behaviors. A control system offering protection from upstream and downstream risks of opportunism is expensive. We would like to demonstrate, from an analysis of VMI and CPFR, that mechanisms to reduce supervision costs, based on trust, can be successfully implemented. Our purpose is to offer leads to decision makers in the field of exchange relationship management, by identifying different contexts depending on the nature of products, specific investments required, logistical channels, etc.

Paper type - Literature review

THE ROLE OF INTERMEDIATION IN ENHANCING THE FLEXIBILITY OF SUPPLY SYSTEMS

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ABSTRACT

Purpose - The purpose of this paper is to critique and extend an existing risk/customer sensitivity model by assessing the role of mix and volume flexibility in increasing a supply system's risk alleviation capabilities and by considering the role of intermediaries in global supply networks. The paper introduces first a framework for supply systems flexibility and then a taxonomy that distinguishes between different supply sourcing strategies based on their flexibility requirements. Ultimately, the paper provides empirical evidence to highlight the fact that even though the existing supply chain management literature views intermediation as a barrier to supply chain transparency, intermediaries can have a beneficial effect in enhancing the flexibility of global supply systems and increasing their risk alleviation capabilities and customer sensitivity.

Design/Methodology - Using Purvis et al. (2008)'s supply network taxonomy, this present paper revisits the framework developed by Faisal et. al. (2006), which proposed that suitable supply chain strategies can be selected based on their customer sensitivity and risk alleviation competency. Empirical research was further undertaken in order to validate the framework and investigate the concept of supply chain intermediation as a risk alleviation mechanism in an international context. A case study research approach was chosen as the main research strategy. The supply chain of focus is a UK fashion retail chain.

Findings - Two key antecedents of supply chain flexibility are utilized: vendor flexibility and sourcing flexibility. The paper identifies the key role of intermediaries in increasing the risk alleviation capabilities along the vendor and sourcing flexibility capabilities of lean, agile and leagile global supply systems.

Research Limitations - A great variety of flexibility enablers need to be considered in order to provide a balanced view of risk alleviation capabilities, hence the case analysis remains at a necessarily high level. At the same time, while the present cases were chosen to be representative, they may not necessarily reflect the experiences of all the different actors in the sector under study. As such, further research will be needed to generalise and enhance our findings.

Practical Implications - The model we developed may act as a route map by which supply chain strategists may develop a flexibility strategy. The paper emphasises the need for a dynamic perspective on different types and degrees of flexibility, based on the supply system's risk alleviation needs. It also highlights the role of intermediation as a means of leveraging ownership and control of supply system resources in order to increase the level of flexibility they can provide.

Originality/Value of paper - Even though there has been a large amount of research on the topic of flexibility, the majority of it has been centred on manufacturing flexibility. What recent research has been done on supply chain flexibility has very much taken a static strategic perspective and ignored the implications that global sourcing can have on the management of these networks. Our paper extends the existing knowledge of supply chain flexibility by looking at the total supply network. Furthermore, the existing supply chain management literature views intermediation as a barrier to supply chain transparency, adding cost but no value. The paper will provide empirical evidence to highlight the role of intermediaries in enhancing the flexibility of global supply chains, depending on whether they are lean, agile or leagile.

Key words - Flexibility, supply chain management, intermediaries, lean, agile, leagile.

A FLEXIBLE COMMUNICATION CONCEPT FOR INTEGRATED SUPPLY CHAIN PLANNING CONCERNING ASPECTS OF TRUST

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ABSTRACT

The purpose of this paper is to discuss the requirements for inter-company communication in co-operative supply chains concerning aspects of trust. The way trust building processes between supply chain partners are supported by implementing appropriate components of information and communication technologies (ICT) is analysed. Existing ICT concepts, such as information encapsulation, information encryption, user authentication and other authorisation techniques suitable for coupling heterogeneous systems are reviewed and evaluated. Finally, the question of whether using innovative ICT for data exchange purposes can affect the trust building process is raised.

Trust and confidentiality can be considered as key factors for the functioning of competitive supply chain co-operation (Li/Zhang et al. 2008). In this paper *trust* is defined as a willingness to rely on a partner in whom one has confidence, for exchange purposes (Moorman et al. 1993, p. 82, Moberg et al. 2002, p. 759). Existing information sharing and ICT concepts for coupling heterogeneous systems are reviewed and evaluated based on trust. A model of how ICT is suitable for supporting and/or enabling supply chain management across companies is explained.

The prototype presented here is based on the premises of a trusting co-operation between two supply chain partners: a manufacturing company and a third party logistics provider.

Key Words – Supply Chain Planning, Information and Communication Technologies, Collaboration, Trust

AGENT BASED SUPPLY CHAIN RISK MANAGEMENT: A CONCEPTUAL FRAMEWORK

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ABSTRACT:

The area of supply chain management has attracted the interest of organizations over the past twenty years. However, the uncertainty that exists in both the demand and supply of resources (especially in economic downturns) is recognized as a limiting factor in achieving its objective for coordinated supply chains. In this respect, modern decision support systems incorporate the management of disruptions along the supply chain. In this paper, an agent based framework it is proposed to manage disruptions in manufacturing supply chains. The framework is an adaptation of a framework suggested by Bansal *et al.* (2005) for refinery supply chains, to the reality of manufacturing supply chains.

Keywords: supply chain management, disruption management, multi agent technology, uncertainty

SIMULATION-BASED IMPROVEMENT OF RELIABILITY OF INTRALOGISTICS SYSTEMS

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ABSTRACT

Intralogistics systems are some of the most vital intersections in modern logistics networks. Due to this significance the reliability and availability of these systems is highly important for the performance of the entire network. Nowadays reliability and availability of these systems are ensured by an overdimensioning of the performance capacity as well as the durability of the material flow technology (static and cost-intensive approach). Research within the Collaborative Research Centre 696 "Logistics on Demand" show the disproportion between performance of the intralogistics systems and the operational demands in order to guarantee the reliability and availability (R&A) of the system. According to this a new approach is aimed with which the intralogistics systems will be run demand-orientedly sized. In this context the warranty of R&A of this newly sized system becomes essential. This chapter presents an alternative dynamic and cost-optimal approach to ensure performance as well as reliability and availability by using a simulation based approach. The basic idea behind this approach is the notion, that capacitive as well as technological overdimensioning causes higher investment and operating costs and therefore might not deliver the best results. Using a simulation model to anticipate the changes according to the varying system load the Anticipatory Change Planning (ACP) is to be seen as a possibility to reduce the redundancy of the material flow technology and to maintain availability without endangering the system performance. In this context the shelving of the material flow technology due to downsizing of the intralogistics system has also to be analyzed.

SECTION 6 – Supply Chain Dynamics and Inventory Management

IMPROVING AND SOLVING THREE NEW SUPPLY CHAIN INVENTORY CONTROL MODELS FOR PERISHABLE ITEMS USING JUST-IN-TIME LOGISTIC

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ABSTRACT

This paper presents three new inventory Control models for perishable items in three-level supply chains using just-in-time logistics. The goal is to minimize the total cost of the whole supply chain. This includes cost of production, cost of freight, cost of preservation, cost of early or late delivery, and cost of perished goods. The first model, for the purpose of simplification, has been developed with the assumption that all goods are delivered to the customers prior to their expiry date and hence there are no perished items. To develop a more realistic model, the second model includes cost of perished goods and considers cases where some of the goods are expired prior to delivery to customer. The third model has been developed to improve the second model even further by considering cases where close-to-expiry items are sold at a cheaper price. Genetic Algorithm (GA) and CPLEX are used to solve and validate the models.

A STUDY OF FORECASTING GUESTS DEMAND FOR A FAMILY RESTAURANT

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ABSTRACT

A manager should consider a business management on running a store. A business management means inventory control of merchandise, schedule control of employee, customer service and so on. In our study, we take notice of a business management in a family restaurant. Especially, we consider about forecasting guests demand. If forecasting precision of guests demand is higher, wastes of inventory of foods are reduced. The forecasting precision of current forecasting system for a family restaurant is not suitable. The method of the current forecasting system is simply that number of guests is forecasted from the number of guests on the same day of the previous year. In this paper, we propose a new forecasting method for guests demand for a family restaurant.

Our method is based on multiple regression analysis. Firstly, we execute correlation analysis, and we select factors which have high level of correlation to numbers of guests. Secondary, we conduct multiple regression analysis, in which these factors are used as explanatory variables. From the above, we lead forecasting formula based on multiple regression analysis. We compare the forecasting precision between our proposal method and current forecasting system. And we find out that forecasting precision of our proposal method is better than that of current forecasting system with a residual analysis.

INTEGRATED PRODUCTION, INVENTORY AND MAINTENANCE POLICIES FOR A SINGLE-VENDOR SINGLE-BUYER SYSTEM WITH IMPERFECT PRODUCTION PROCESS

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ABSTRACT

Purpose

In this paper we propose and compare two single-vendor single-buyer management strategies integrating production, inventory and maintenance in the context of an imperfect production process. We aim to determine, for any given situation, the strategy that yields the optimal integrated total expected cost. The first strategy assumes that the ordered quantity is produced continuously but delivered in equal small sized lots. At the end of each production cycle, a preventive or a corrective maintenance action is undertaken depending on whether the production unit has shifted or not to the out-of-control state generating non-conforming rejected items. The second strategy consists in producing and delivering the ordered quantity in separate lots of equal small sizes and performing, at the end of each production cycle, a preventive maintenance action if the system is in an in-control state. Otherwise if a shift to an out-of-control state occurred, a corrective maintenance action is carried out.

Design/ Approach / Methodology

Both considered strategies are modelled mathematically. Due to the complexity of the models, a numerical procedure to find out and compare approximate optimal solutions is used.

Findings

The obtained results have demonstrated that one of the proposed strategies or the other can be used by the vendor and the buyer. The choice, depending especially on the unitary maintenance costs and the production rate of non-conforming items, is made comparing the approximate optimal expected total costs corresponding to each strategy for any given set of input parameters.

Research implications

The paper deals with the joint vendor-buyer lot-sizing problem for an imperfect production system which may randomly shift to an out-of-control state and produce non-conforming items. We attempt to integrate in two different models the main aspects of any supply chain management system: production, inventory, quality and maintenance. The best compromise between the number and type of performed maintenance actions and the quantity of non-conforming items rejected, during the production of the ordered quantity, is determined using a numerical computation algorithm.

Originality/ Value

Unlike the hitherto joint lot-sizing models developed in the literature, we integrate in our approach a maintenance policy in order to restore the system in the in-control state.

Keywords: supply chain management, production, inventory, maintenance, quality, single-vendor single-buyer

Paper Type: Research paper

DETERMINING APPROPRIATE SUPPLY CHAIN INVENTORY STRATEGY FROM DIFFERENT PRODUCT LIFE CYCLE PATTERNS

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ABSTRACT

The supplier in a supply chain usually has difficulty in making appropriate inventory strategy due to the distorted market demand information caused by the multiple echelons of a supply chain. Therefore, suppliers having close relationship with their downstream members can implement special practices, e.g. VMI, to reduce inventories while maintaining high level of customer services by obtaining both inventory and market demand information from downstream members. However, in many cases, suppliers cannot easily acquire precise market demand as well as inventory statuses of downstream members. In addition, the costs of implementing special supply chain management (SCM) practices may alleviate or even counterbalance their benefits. Since diverse market demands incur different benefits in inventory saving and customer service levels, we need to evaluate the benefits of SCM practices before implementing them. This research is to study the benefits generated from implementing the SCM practices of VMI vs. ordinary order-up-to inventory strategy under different market demand patterns.

To model distinct market demand patterns, we employ the non-uniform influence (NUI) diffusion model of product life cycles (PLC) for its ability in quantifying the product demand over the entire life cycle to represent different product demand patterns. The Easingwood's (1998) product life cycle (PLC) model based on diffusion theory shows that larger external influence factor, b , induces spontaneous demand with high variation, while smaller non-uniform influence coefficient, δ , makes the peak demand occur earlier. Past research indicates that information sharing has higher benefits when demand variation is larger. Based on distinct PLC patterns, we experiment with simulation to study the benefits of implementing VMI practices as compared to traditional (s,S,R) policy. Two hypotheses regarding the effects b and δ on inventory benefits for VMI practice v.s. (s,S,R) policy are proposed and verified. The results suggest that for products with larger b and smaller δ , companies can gain more benefits from implementing VMI practices than for products with smaller b and larger δ . By knowing the impacts of PLC classes on the benefits obtained from information sharing, supply chain managers can make appropriate SCM practices without investing too much but gaining too little.

A COMPREHENSIVE OUTSOURCING ANALYSIS FROM THE SYSTEM DYNAMICS PERSPECTIVE

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ABSTRACT

Purpose

This study applies system dynamics (SD) methodology to explore factors affecting an outsourcing decision in the early stage of industry life cycle, which is critical in determining firm's future competitive advantage.

Design/methodology/approach

Through the application of SD framework, this research offers a more systematic outsourcing cause and effect analysis. This study establishes a dynamic model of various factors affecting an outsourcing decision through the causal loop diagram also known as the cause-and-effect chain. The causal loop diagram will include the main interactive dimensions, such as product attractiveness, product demand, product standard, product technology, and product compatibility, associated with an outsourcing decision.

Findings

The conventional discourse on outsourcing often stresses the role of the benefit and risk associated with any outsourcing decision. However, such analysis of outsourcing is incomplete without recognizing forces, such as industry entrants, technology evolution, and product design, which enticed firms in an industry to consider outsourcing. In addition to these forces, it is also crucial to consider the changing roles of benefit and risk associated with outsourcing throughout the industry evolution.

Originality/value

This study is a first attempt to analyze outsourcing from a system dynamics perspective. The SD approach simplifies the complex relationship of factors affecting an outsourcing decision and might be useful in assisting firm's outsourcing decision making process.

Keywords: Outsourcing, system dynamics, outsourcing benefits and risks, industry life cycle

Paper Type: Conceptual paper

SECTION 7 – Decision Support Systems and ICT in Supply Chains

SUPPLY CHAIN RISK MANAGEMENT WITH DATA WAREHOUSES

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ABSTRACT

Supply Chains belong to the hybrid concepts that are settled in the range between market and hierarchy and, to that extent, are subject to a particularly complex coordination. Neither simple market nor planning mechanisms are appropriate in this case. Instead, the complete realisation of the advantages of the concept is only possible if cooperative behaviour between the independent partners of a supply chain can be established without giving up the advantages of autonomy.

Supply chain management is most of all concentrated on production cost advantages. Transaction costs, i.e. especially information costs, which accompany the entire business process, are not regarded. Nevertheless, if information is delivered incompletely or incorrectly, it carries considerable information risks. There is a range of information risks, which in this intensity is not known in other cooperation forms. If these risks are not understood and reduced, existing production cost advantages in a supply chain management are strictly compensated. The existence of such risks is an essential objection to the establishment of a sustainable supply chain, which will be successful in the long run.

The decrease of these information risks is an important aim in supply chain research. This paper examines how information risks can be discovered, classified and controlled by implementing data warehouses. The implementation of a data warehouse in a supply chain in order to reduce the risk is hardly discussed in literature.

For this purpose a system dynamic simulation model of a three stage supply chain is developed. All supply chain partners in this model act according to the Beer Game of Sterman. Then several data warehouses are implemented in this supply chain to decrease the information risks. To show the consequences of a delayed information process, the order times on the stage of the supply chain are enlarged during a short period of time. After that period of time the orders arrive again in the regular time for the rest of the simulation.

Several measures are computed to analyse the advantages of a data warehouse. The analysis of these measures shows that both tested data warehouse architectures are able to reduce the information risks significantly. An architecture where the information is not stored centrally can reduce the risks nearly as good as a central data warehouse.

REAL TIME ITEM TRACKING USING SERIALIZED GLOBAL LOCATION NUMBER (SGLN) AT CARGO TERMINAL

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ABSTRACT

Because of its high accuracy, high security and speediness, air cargo industry is rapidly expanding its business portion in the global logistics. Compared to port logistics, air cargo logistics has to deal with high-valued goods which require high level of tracking services- real time, item level tracking capability. In the past barcode was the only available technology for cargo logistics but due to the disappointing performance of barcode system, currently there has been wide adoption of Radio Frequency Identification (RFID) technology in cargo logistics.

In this paper, in order to provide item level tracking capability with relatively precise location information at cargo, we suggest a management solution by applying EPCglobal's Serialized Global Location Number (SGLN).

Keywords: Air Cargo, RFID, SGLN

AUTONOMOUS ORDER ALLOCATION IN LARGE DISTANCE APPAREL INDUSTRY SUPPLY CHAINS BASED ON USE OF RFID TECHNOLOGY (a case study)

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ABSTRACT

Purpose

This paper aims to show how the concept of autonomous control of logistic processes can be implemented in apparel industry supply chains using capability enhanced smart label technology, and how it can be applied to improve management of deficiencies, shortages and remaining quantities of goods.

Design/Approach/Methodology

The paper is based on a case study, which is used to illustrate information related problems in apparel supply chains. As a solution to these problems it develops a control method for autonomous order allocation by goods and articles. The method is founded in the paradigm of autonomous control of logistic processes. To discuss implementation of the method, a framework from literature is used, which defines six steps of RFID technology enhancement. Discrete event simulation is used to study the effects of the method on the case study's logistic performance.

Findings

The paper demonstrates that implementation of the method is possible by use of smart labels, which combine the capabilities of RFID transponders with real time location and data processing. The discrete event simulations show that use of the autonomous order allocation method in apparel supply chains offers improved delivery service levels of retailer orders.

Research limitations/ implications

The autonomous method and its technical foundations are still on a conceptual level. The discrete event simulation so far only considers availability of goods, but no cost related aspects.

Originality/ Value

The major contribution is an example how to implement the emerging concept of autonomous control in logistics, using capability enhanced RFID based smart labels, and how to apply the concept to apparel industry supply chains.

Keywords: Autonomous control of logistic processes, apparel industry, supply chain, smart labels, RFID technology

Paper Type: Case study

BRINGING NEW PARADIGMS TO INTELLIGENT TRANSPORTATION SYSTEMS (ITS) IN LOGISTICS BY CONSIDERING THE USE OF DEDICATED SHORT RANGE COMMUNICATION (DSRC) TECHNOLOGY IN MULTIMODAL OPERATIONS

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ABSTRACT

The growing complexity of logistics has raised the profile of Information and Communication Technology (ICT) as means to improve the levels of visibility and responsiveness in supply chains relying in multimodal operations. ICT-based initiatives supported in different countries have been looking at enabling Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communications using technologies such as Dedicated Short Range Communications (DSRC) mainly for road traffic safety and control. However, the impact on logistics operations has not been fully addressed. The potential implications of DSRC to multimodal logistics are explored in a use case comprising the tipping of bulk material carried by vessels, unloaded into haulage vehicles which transport it to different depots within the port area. Event flow, mapping and simulation analysis provide evidence on the suitability of adopting DSRC to meet the needs of multimodal logistics in terms of track and trace, security and visibility.

KEYWORDS

Multimodal logistics, Road Haulage, Intelligent Transport Systems, DSRC.

LOW-COST RFID FOR INDUSTRIAL APPLICATIONS

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ABSTRACT

Purpose of this paper

This paper describes new opportunities of facilitating container management by the use of RFID technology. The authors approach the paper's topic from different perspectives, resulting in entirely different points of view and foci. However, within the frame of interdisciplinary collaboration, it gets apparent a common goal exists, to develop strategies and tools facilitating the work of decision makers in logistics. For this purpose one part addresses the management of returnable containers for the automotive industry. The other part describes the improvement of its automatic and reliable identification by means of the development of a new antenna concept for passive UHF transponders.

Design/methodology/approach

One of the prerequisites for an efficient planning and control of container loops is the transparency of the material flow, i.e. the availability of information relating to actual stocks, storage periods of containers, levels of utilisation and a lot more in real time. More attention has to be paid to the container function "information carrier", especially in the planning period of logistics systems. The improved basis of information regarding the state of container loops has to be used in an appropriate way. Already in the stage of planning, evaluations, reports and alarm messages need to be defined among others, which in turn prompts the responsible personnel to structured acting and taking corrective action relating to the container flow, if required. Within the frame of this paper, development of technology means direct impact of function parameters of the RFID technology. As the automatic identification of special containers via RFID takes place under the strong influence of metallic materials, it is the goal of the development of technology to guarantee secure identification on metallic ground without cost-intensive damping of obstructive properties. The starting point for this is the development of a new antenna concept, which is being optimised for a printing-based production.

Findings

Within the frame of a cooperative project called "iBox", a control cockpit for special container loops is created, which gives persons responsible in logistics the opportunity to recognise the container loop and therefore to plan the parts flow in a better way to detect shortage in an early stage and to intervene for corrective action. Planning and control are based on current data, which are recorded by means of RFID technology and which are then transferred to the cockpit. To achieve this goal, a planning method including tool, controlling approaches on the basis of RFID data and various aspects regarding the RFID technology to be applied are examined and a respective software prototype is developed. Furthermore, a new high functional RFID transponder antenna structure could be developed. The manufacturing is based on printing processes at reasonable costs. The results can thus be assigned both the fields of high-frequency technology and printing technology.

What is original/value of paper

On the field of container management a dashboard architecture is shown as a approach to facilitating the work of decision makers in container logistics. It provides visualisation of the container movements and flows and offers different evaluations and statistics. The value of this data should be reflected during the planning period of new container loops. Now, the quantity of container stock can be scaled on the real demand on containers within the supply chain. This results in a decrease of capital commitment (warehouse, container). The reported antenna structure opens a new field of applications especially for the low-cost sector of RFID technology. Our passive approach furthermore copes with the challenge of applying this technology in metallic environments or on metal objects. It may functionally and cost-efficiently replace contemporary active RFID transponder technologies.

Paper Category: Research Paper.

A STUDY OF THE SMART CONTAINER MONITORING SYSTEM IN THE OCEAN SHIPPING INDUSTRY

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ABSTRACT:

There are more than 146,172,823 TEUs containers handled through the top ten container ports in 2006. With such a large amount of container throughput, how to accurately read the container I.D. at the gate during their entering into and leaving from a container yard is a major issue. An appropriate monitoring system can not only improve the yard's operation efficiency but also reduce the yard's operation cost.

There are two types of technology currently employed to help identify the container external markings with detailed cargo information, namely, (1) Optical Character Recognition (OCR) and (2) Radio Frequency Identification Tag (RFID). According to the author's knowledge, there is no academic study to compare the cost and benefit of the two container monitoring technologies systematically. This research employed the AHP methodology to find out the major criteria influence the container yards' monitoring system selection decision by distributing AHP expert questionnaires to major stakeholders in the ocean container shipping industry in Taiwan (see Figure 1).

The initial finding indicates using an OCR system could result in a higher benefit /cost ratio, which means OCR is perceived to be the better container monitoring systems by most of the major carriers in Taiwan.

Key Words: AHP, OCR, RFID.

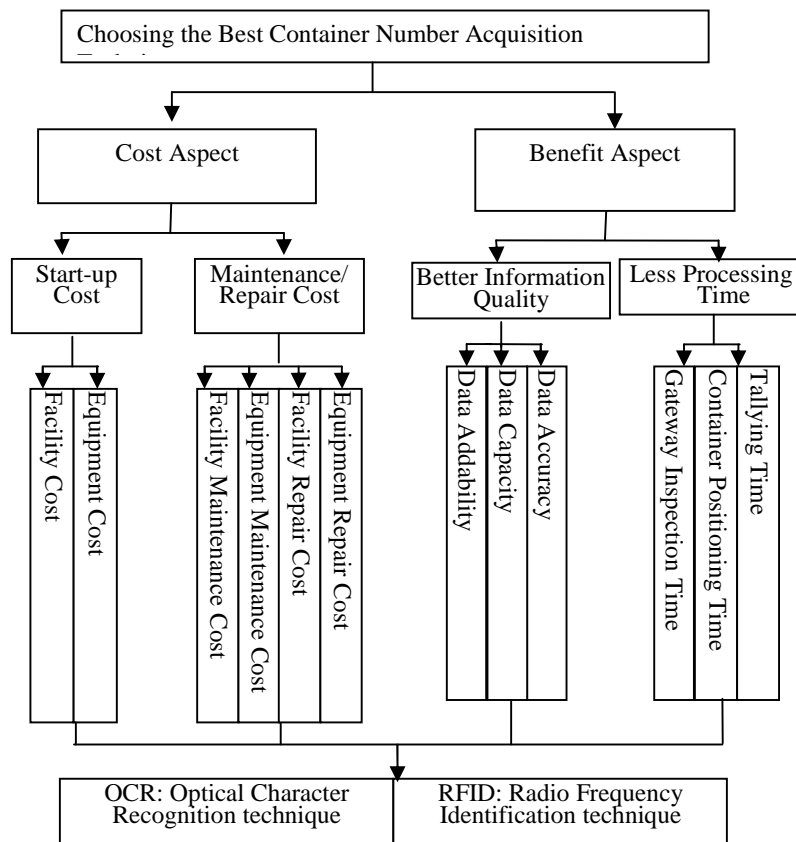


Figure 1 Cost Structure and Benefit Structure of the container monitoring system

OPTIMAL CONTRACTS AND INFORMATION DISTORTION

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ABSTRACT

This paper examines optimal contracts in a principal-agent model with both moral hazard and adverse selection in which the agent can choose a costly signal to falsify her private information. We consider an environment in which a risk-neutral manufacturer (agent) supplies a product to a risk-neutral retailer (principal). The manufacturer is assumed to have private information about her production cost. It is also assumed that the manufacturer can signal her type by incurring costs and exert efforts for increasing the probability of being efficient. We examine the effects of the manufacturer's costly signals and efforts on the level of production and characterize the optimal contract. We demonstrate that the optimal contract exhibits different regimes depending on the costs of signals and those of exerting efforts and that there exists a case in which the agent sends costly signals to the principal.

USING MOBILE AGENT TECHNOLOGY FOR FULFILLING THE VISION OF INTELLIGENT CARGO

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ABSTRACT

The Logistics area has seen a huge growth in the last few years. This growth is on the one hand a result of the globalization which has led to international supply chains which require sophisticated logistics concepts. On the other hand the development of ecommerce has additionally boosted the need for logistics concept. Here it is also interesting to note that while the overall consignment number has increased the consignment size has decreased, leading to more and smaller consignments that need to be transported to different locations. The smaller consignments pose a huge problem to the logistics service providers and their goal to be to keep the bundling of the consignments as long as possible in order to enable the best usage of the transport vehicles with as much consignments as possible. This goal hasn't been reached so far and thus e.g. the utilization of trucks is in some countries lower than 60%. This rather weak utilization of the transport vehicles does not only pose a problem to the logistics providers as well as forwarders, but also poses a substantial problem to our environment. The emissions caused by the transport sector are still one of the highest. The ultimate goal therefore has to be to increase the utilization of the transport vehicles in logistic while maintaining and developing the integration of the developing countries.

One of the main objectives of the EU funded project EURIDICE is the development of a platform with distributed business process intelligence relying on the vision of intelligent cargo. The final paper will provide a short overview how the concepts of mobile agents are utilized for fulfilling this vision, and how the agents are organized.

By using existing or new information and communication infrastructures (e.g.,GPS, Galileo, UMTS) it is possible to define a uniform Information triple Item (time, place and status) for all transported goods in Europe. The use of these data limits itself currently, nevertheless, in primarily to easy "tracking and tracing"-functionalities. In the project EURIDICE, based on this information, added value services should be defined, allowing an individual control of the transport goods in the European home market. For an effective implementation the data acquisition and decision-making should result to a very great extent on mobile devices, being able to react on one hand without delays to logistic events and on the other hand to reduce communication expenditures.

The mobile devices within EURIDICE therefore offer services for accessing different data by any authorized party in the logistics chain utilizing the platform built around these mobile services for integrating them with legacy systems and orchestrating them to build whole new logistic processes. To fulfill these requirements two main concepts of the project are SOA in combination with web services and mobile agents.

In the final paper we will concentrate on a possible architecture for the mobile services using mobile agents, modern mobile communication infrastructures and the capabilities of today's available devices. We would like to discuss some design decisions for the mobile application running on different mobile devices, installed within containers or cargo items.

The EURIDICE agent application architecture was designed to ensure flexibility, scalability, robustness and maintainability in and mobile, resource-limited environment.

DEVELOPING A DECISION SUPPORT FRAMEWORK FOR IDENTIFYING KEY EXTERNAL FACTORS FOR POSTPONEMENT IMPLEMENTATION

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ABSTRACT

Postponement is an increasingly used and effective supply chain strategy for mass customization of products i.e. increasing operational flexibility, reducing costs and lead times. This paper makes a clearly defined contribution to the field by directly extending earlier work by Graman and Magazine (2006), by considering the external factors required for postponement decision making. The framework allows practicing operations managers to identify and understand criteria, which are external to the boundary of the firm, and essential for guiding strategic decisions regarding postponement. Key issues involve outsourcing, the need to protect intellectual property (intelligence postponement) and also environmental uncertainty.

ENHANCING THE OPERATIONAL EFFICIENCY OF THE GLOBAL SUPPLY CHAIN THROUGH THE DEVELOPMENT OF AN E-BUSINESS MODEL: A CASE STUDY OF ALEXANDRIA PORT OF EGYPT

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ABSTRACT

The purpose of this research is to investigate the efficiency of global supply chain information and operations and to examine the importance of enhancing global supply chain management and operations through using electronic business transactions for the case study of Alexandria port of Egypt. The research addresses the issue of the feasibility of introducing a tailored e-business model to enhance global supply chain operations in Alexandria port with a view to increasing the competitiveness of the port. The code name for the proposed model is **GEMA** Model i.e., **G**lobal **E**-Business **M**odel for **A**lexandria will be presented here to emphasize the necessity of each element included that suit the Egyptian environmental particularities.

An analysis of the current systems applied in Alexandria port will be also presented here with the view to highlight critical issues and emphasize the need for a system change. Alexandria port is the largest port in Egypt and the only port that deals with all types of cargo. They currently operate with two systems. One is a manual documentary system that has been proved to be obstacle due to the long procedures required to finalize an operation. The other one is a web-based semi-automated system, which has been recently adopted by Alexandria port recently. This second system is considered semi-automated as it concentrates only on customs procedures. The use of the two systems is sometimes challenging for the users. The research reveals that a system change is needed which should consider elements such as: securities, strategies, policies, cultures, and skills that suit the local environment leading to improved port performance.

SECTION 8 – Logistics in the Service Sector

MANAGING LOGISTIC SYSTEMS FOR THE CREATION OF SUSTAINABLE TOURISM ON KOH LAN CORAL ISLAND

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ABSTRACT

Nowadays, tourism has become a significant industry in Thailand's economy. Tourism generates high revenues, as compared to the revenues from exporting. Koh Lan is a beautiful example of Thai tourism today. It is an island just out from the beaches of Pattaya City, in Chonburi province. Koh Lan has become an important tourist destination. However, ever-increasing tourism has created problems there related to the sufficiency of its infrastructure systems and facilities. These problems include growing demand on natural resources and an escalation of environmental pollutants. Further, these problems are pointing to an urgent lack of effective logistical planning and management.

This study applied principles of logistics management to the tourism industry under the hypothesis that moving tourists from Pattaya to Koh Lan more efficiently and effectively, including providing an effective transport networking system, would increase and support tourism on Koh Lan. A demand forecast for tourism into the next decade was statistically calculated in order to provide recommendations for the improvement of infrastructure systems and facilities.

An objective was to examine an appropriate demand forecast model for tourism on Koh Lan. The results could be used for planning infrastructure systems and facilities, including strategies for transport networks and logistics systems to support the future growth. Data was collected from secondary and primary sources, e.g. questionnaire and in-depth interview. The questionnaire was distributed to 270 potential participants, with 245 questionnaires being returned, for a 90.74 % return rate. Validity and reliability were examined.

The result showed that a time series would be an appropriate model for a demand forecast. It found that tourism to Koh Lan would double in the next decade. This result should be used for designing transport and logistics systems from Pattaya City to Koh Lan. Today, more than 1,500 trips a day by ferry and speed-boats are used for tourist travel from Pattaya City to Koh Lan. Effectively designed infrastructure systems and facilities are required to support sustainable tourism on Koh Lan. Further, this study learned that new and fantastic tourist facilities would be increasingly built on the island, underscoring the need for an appropriate plan for managing environmental pollution.

Finally, this study pointed out that a reverse logistics system for garbage management would need to be effectively utilized. Rapidly increasing garbage is a problematic issue for logistics related to a sustainable, green, eco-friendly environment. This study concluded that strategic and integrated logistical management is necessary, with participation from all stakeholders.

Keywords: Tourism, Logistics, strategy, demand forecasting, Island, Thailand

SCOR MODELLING OF AN RFID ENABLED SUPPLY CHAIN FOR ROI ANALYSIS

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ABSTRACT

Purpose – To support the uptake of RFID (Radio Frequency Identification) technology amongst supply chain partners, a framework has been developed to quickly model positive business benefits arising from RFID adoption and to facilitate ROI (Return on Investment) analysis.

Design/methodology/approach – This paper describes a business process modelling tool that is based on the SCOR (Supply-Chain Operations Reference) model and IDEF0 (ICAM Definition language), which is extended to include time and cost weightings for ROI analysis. This is to provide a quantitative analysis of labour costs and productivity gains achieved through RFID data and process automation within business processes. The method described encompasses business process and data modelling concepts, as RFID implementation has an impact on the business operations and information architectures.

Findings – The business process modelling at SCOR model level 4 or higher levels provides an excellent start for process modelling and process re-engineering in order to perform ROI analysis. RFID implementation can increase data-entry accuracy so that mis-shipments, lost inventory and redundant data reads can be reduced.

Practical implications – The SCOR modelling tool and ROI calculator developed in this research can be applied to other cases where “as-is” and “to-be” scenarios can be constructed. While the SCOR concepts provide a perfect start point for process representation, the feature of allowing user customization of the tool enhances the flexibility of business process modelling.

Originality/Value – This research constructs a visual business process modelling tool based on the SCOR concept and provides a spreadsheet based ROI calculator for justification of adopting new technology and additional investment to projects.

THE HUMAN SIDE OF LEAN LOGISTICS

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ABSTRACT

Purpose: the paper aims to construct and apply a tool to show that lean management can overcome the misfit between worker expectations and job characteristics which will enhance employees' personal outcomes.

Design: the paper uses three complementary methods: a literature review to construct a model for job design in lean logistics service providers, a survey to determine a fit between job and worker characteristics, and a start of Kaizen-based action research

Findings: The most important result indicated that the extent to which the level of creativity desired by workers fitted the level of creativity required by their jobs was a strong predictor of psychological states (e.g. meaningfulness) and outcomes (e.g. turnover intent) Given the possibilities offered by the concept of creative tension, we argue that the lean philosophy provides the tools to promote the human side of logistics.

Implications: survey results indicate how LSPs can improve the productivity of their workforce using lean practices from the HRM, TQM and TPM bundles and implement intrinsically motivating jobs.

Value: major contributions are elaboration of the relationship between LSPs and their employees and identification of where kaizen improvement trajectories can be directed to.

Keywords: lean management, logistics service provider, job design, lean implementation

Paper type: research paper to construct and test a model

USING LOGISTICS SERVICES TO ACHIEVE SATISFACTION AND TURN CORPORATE BRAND EQUITY INTO LOYALTY

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ABSTRACT

Purpose: This research applies theory and techniques from the services and marketing literature to a logistics service provider (LSP) context to determine whether corporate brand equity and the LSP's service offerings lead to customer satisfaction which in turn leads to increased customer loyalty towards the LSP.

Methodology/Design: A conceptual model was developed from the literature and includes four latent constructs of corporate brand equity, satisfaction, service and loyalty that are underpinned by nine manifest variables. A survey of over 200 Finnish industrial firms was conducted to explore these constructs.

Research Findings: Data were analysed using structural equation modelling and the relationships among the four constructs in the conceptual model were supported.

Research Limitations: Although primary empirical research was conducted the context of the research was companies in one geographical context, Finland. However, the results indicate that the theory and constructs should hold in other contexts.

Practical implications: The findings of this research should enable management of LSPs to determine those service offerings most important to their customers and develop a service package using such offerings to satisfy the customer needs and thus build corporate brand equity and loyalty.

Originality/value of the paper: This paper adds to knowledge of customer service and satisfaction in logistics, particularly LSPs, and provides an interdisciplinary approach to research in the logistics domain.

SUPPORTING THE IMPLEMENTATION OF THE INTELLIGENT CARGO CONCEPT BY DEVELOPING A MULTIMEDIA LEARNING FRAMEWORK

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ABSTRACT

Due to the implementation of new information and communication technologies, an increasing globalisation as well as the need for a reduced time to market, the competition between different supply chains and their stakeholders increases.

A newly started integrated project, EURIDICE aims to create the necessary concepts, technological solutions and business models to establish the most advanced information services for freight transportation in Europe. The project is built upon the Intelligent Cargo concept. The EURIDICE platform will support "on the fly" combination of different categories of services to fulfill the unique needs of every specific interaction between user, context and cargo. Accordingly, the project will integrate and further develop technological components and approaches in three main areas:

- Cargo Connectivity
- Cargo Intelligence as well as
- Cargo Services Infrastructure
-

The basic concept of EURIDICE is to build an information services platform centered on the individual cargo item and on its interaction with the surrounding environment and the user. The platform will allow addressing simultaneously the logistics, business and public policy aspects of freight transportation.

Not only the efficiency of the implemented ICT is a key indicator for the competitiveness, also the skills and the competencies of every involved stakeholder is important, thus the need for vocational training of the stakeholders in a supply chain increase. Therefore, the EURIDICE project does not only include the development of the technical solution, but also the development of stakeholder specific training material based upon a set of user centric curricula. The main objectives is therefore to develop a learning framework including different curricula and training material exactly fitting the training needs of the involved stakeholders, so that the participation of an employee in the EURIDICE learning and training framework will improve his/her skills in applying the implemented ICT in the most efficient way as well as to increase the awareness for needed organisational changes.

This paper will present an approach developed within the EURIDICE integrated project on how such training could be organised and which components needed.

SECTION 9 – Environmental Sustainability and Green Logistics

WASTEPAPER MINING: A SUSTAINABLE GOLDMINE

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ABSTRACT

In this research paper we want to explore a new way to handle recovered paper. The purpose of this paper is to understand the situation with China. Since years, this country is the most important market for recovered wastepaper collected in western countries from households. The efforts to get it there, necessitate an enormous number of transport movements, both within Europe and outwards to China and this number is growing exponentially. This paper is the result of a research of an alternative collecting and processing (The WastePaper Mining) concept, which will make a substantial contribution to reducing the number of transport movements and alleviating the pressure on infrastructure capacity. It will have potentially great implications for the collection and movement of recovered paper. On balance that makes it possible to come a big step nearer to achieving sustainable logistics in the recovered paper sector.

SUSTAINABILITY IN LOGISTICS PRACTICE

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ABSTRACT

This conceptual paper wants to emphasize the use of the concept of sustainability within logistics and especially transportation. While working on a new tool to help companies develop sustainable European networks, we discovered that we wanted to use a specific concept of sustainability: People, planet and profit. This paper will first discuss the main concepts of sustainability and show a tool which could aid decision makers in the choice between networks in Europe. We will show that making the results of network possibilities visible will aid these decision makers and show the implications on sustainability.

SELECTION OF SUITABLE METHOD AND LOCATION FOR MUNICIPAL WASTE DISPOSAL IN CHIANG MAI AND LAMPHUN PROVINCES

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ABSTRACT

Purpose of this paper: The aim of this study is the selection of the suitable method and site for municipal waste disposal in southern Chiang Mai province and some parts of Lamphun province.

Methodology: An Analytical Hierarchy Process (AHP) and the Geographic Information System (GIS) is used to select of the suitable method and site for municipal waste disposal.

Findings: From this study, the sanitary landfill method was the best solution with the highest overall evaluation score of 0.604. The result by initial screening and prioritization on sanitary landfill site selection found that, for Chiang Mai, province the sanitary landfill site of Ban Tan sub-district, Hot district was the best option with the highest overall evaluation score of 0.220 and, for Lamphun province, the site of Sri Bua Ban sub-district, Muang Lamphun was the best alternative with the overall evaluation score of 0.156. In the selection step, the result indicated that the most important primary criterion was public acceptance aspect. The other significant criteria were economic, physical, and functional impact aspects, respectively.

Contribution: AHP and GIS which are the systematic applications for the decision making process are found suitable for this study. This evaluation alternative provided convenience, accuracy and reliability.

CATEGORY FOR THE PAPER: Research paper

RO-RO SERVICE AS A CONTRIBUTION TO GREEN LOGISTICS

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ABSTRACT

The finds and highlights from the Sea-Road project is presented. This project is a multimodal RoRo (roll-on, roll-off) solution that integrated door-to-door transportation service that combines sea and road, and is based on trailers.

The Sea Road Project consisted of the RoRo service, based on weekly regular sea freight between the ports of Leixões (PT), and Liverpool (UK). The road routes from which freight was shifted by the action were positioned in Spain and France through the offering of a port-to-port sea transport service from Portugal to the UK and vice versa thereby, avoiding the in-transit crossing of lorries.

The Sea Road integrated service was faster and more competitive than the existing road transport solution. Market analysis strongly indicated there to be a real demand to make this project a viable project. EU growing environmental restrictions to road circulation, along with restrictive labour policies, made this short sea shipping solution even more attractive.

The feasibility plan was based on a traffic analysis, conducted by external consultants (TIS.pt - Transportes, Inovação e Sistemas, S.A.) in the second half of 2003. From analysis of the commercial flow between the countries involved and the interviews performed with a significant part of the forwarding agencies operating in Northern Portugal, they have concluded there to be a real demand for this kind of service. These figures were updated and confirmed in 2005 by corporate finance consultants, Messrs Change Partners, and finally in 2006 the schedule was determined in light of latest market research.

Although the market analysis strongly indicates there to be a real demand to make this RoRo project a viable project, it had not succeeded.

This paper presents the finds from this projects trying to highlight the reasons of its failure and, based on it and the current reality, to develop guidelines that could use these RO-RO Transport Solution as a contribute to a green logistic.

Keywords: RoRo solution; Green Logistic; Sea-Road Solution

INNOVATIONS IN LAST-MILE LOGISTICS: THE RELATIONS WITH GREEN LOGISTICS, REVERSE LOGISTICS AND WASTE LOGISTICS

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ABSTRACT

Purpose

The aim of this paper is to study in detail the relationship between innovative concepts in the last-mile part of the supply chain and its direct and indirect environmental effects on green logistics, reverse logistics and waste logistics. When speaking about "innovations in logistics", those four topics are nowadays real "buzzwords" but the relationships between those four concepts and their impact on each other are not often taken into account.

Design/ Approach / Methodology

During the research process of this paper, three complementary methodologies were used: first of all, the relevant literature was reviewed. Second, several interviews with logistics experts from several different sectors (private, public, ...) were done and third, the concept of the Green Logistics Triangle was analyzed during an expert meeting about innovations in logistics.

Findings

This paper identifies that the relationships between green, last-mile, reverse and waste logistics need to be taken more into account when screening a supply chain for innovative optimization than nowadays. This is the fact for academic studies as well as for public entities and private companies. The Green Logistics Triangle is a framework that attempts to simplify, visualize and identify several different direct and indirect relationships between the four aforementioned mentioned parts of the supply chain, and it allows making them visual.

Research limitations/ implications

This paper is the result of a preliminary research part for a research project/paper with the aim of screening the supply chains (using the Green Logistics Triangle) and categorize them in the characteristics (ex. Costs, time, frequency, punctuality, environment, ...) that are most common in innovative adaptations in logistics. This makes it possible to screen, as mentioned before, the direct and indirect relationships between last-mile, reverse, waste logistics and green logistics and in a further stage to look more in detail to common characteristics.

Practical Implications

One of the major aims of this paper is that the outcome should be useful for academic research as well as for private companies and public entities.

Originality/ Value

The value of this paper can be described as an attempt to put more stress on intra sub-logistical direct and indirect links which have significant implications on each other. Nowadays these relations are not often taken into account in papers separately.

KEYWORDS: Innovation, green logistics, reverse logistics, last-mile logistics, waste logistics, home deliveries

Paper Type: Research paper

ACTIVITY BASED LIFE-CYCLE MANAGEMENT FOR GREEN LOGISTICS

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ABSTRACT

In this research, we introduce an activity based lifecycle management system for analyzing accurate product lifecycle and product value. The research applies Radio Frequency Identification (RFID) and Product Lifecycle Management (PLM) concept to manage life span of a product. Product value can be evaluated by life span of a product and activities occurred during its life span. In order to calculate product value, we applied an activity based cost management. In our research, cost management consists of three costs: manufacturing cost which is decided at producing stage, price which is included manufacturing cost, service cost and margin and present value which comes from real life span of a product.

Keywords: Activity Based , Life Cycle, Green Logistics

COORDINATING PARISIAN URBAN TRANSPORT

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ABSTRACT

A large research project has been initiated by the French government gathering together a consortium of industrial firms (transport companies, intermediaries, software companies) and institutional researchers to study the issues regarding traffic jams, fuel consumption and pollution; initially from a micro-perspective, but rapidly to encompass the logistics needs of several sectors. The project has been designed to explore the sharing of total transport capacity with other vendors via a market portal which it is hoped will also reduce the pollutants across Paris, and later in other French cities.

Importantly the portal will handle legal issues (in-transit responsibility for others' goods) as well as promoting new models for routing that will take into account real-time congestion to minimise fuel consumption and pollution over a multi-modal delivery system for multiparty operators. A further issue to be addressed is that of honestly sharing the available capacity in this new scenario – a system envisaged as similar to the route/capacity sharing in the airline industry. The duration of project is 3 years; the first trial will be realised in Paris and its suburbs and could yield results in the first 18 months.

DO CORPORATE GOOD GUYS PAY OFF THEIR GOOD DEEDS IN GREENNESS?

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ABSTRACT

Purpose

The purpose of the study is twofold: first, to explore whether a linkage between environmental effort and financial performance exists; second, to investigate if firms with more environmental efforts show a more significantly positive relationship between environmental performance and financial performance than those with less green efforts.

Design/methodology/approach

The study adopts correlation analysis of a sample comprised of 51 European companies from 14 industries across 15 countries to investigate the possible relationship between firm environmental performance (includes three measures: sustainable value, sustainable value margin, and return to cost ratio) and financial performance.

Findings

The paper does not find a positive relationship between firm environmental performance and financial performance. Both the Pearson correlations and Spearman's rho are statistically insignificant for both the full sample and the carbon-intensive sectors.

Originality/value

The paper provides a new perspective on the relationship between firm environmental performance and financial performance in monetary terms by taking a broader view at the environmental outcomes. While past studies only measure firm environmental performance based on damaging impacts to the environment, this research also considers the efficiency of resource use by the firm.

Keywords: Environmental performance, Financial performance, Green, Sustainable value.

Paper Type: Research paper

REAL TIME ASSIGNMENT OF CO₂ EMISSIONS IN TRANSPORTATION PROCESS -A SYSTEM DEVELOPMENT AND ANALYSIS OF INFORMATION SYSTEM WITH RFID-

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ABSTRACT

Purpose

This paper aims at a development of the structure of the information management system for environmental logistics to measure CO₂ emissions caused by distribution activities with high accuracy. The information management system consisting of "The information system to get the data of fuel consumptions" and "Radio Frequency Identification (RFID)-Tag information system" is developed and verified to grasp the CO₂ emissions by each transported goods unit.

Design/ Approach / Methodology

The conducted research technique is developed from an information model consisting of "The information system to get the data of fuel consumptions" and "Radio Frequency Identification (RFID)-Tag information system".

Findings

By using the information system, the amount of the CO₂ emission per goods individually can be calculated on real time through the system.

Research limitations/ implications

One of future developments should have the functions to the fuel gauge where the both times can be automatically distinguished and recorded. Another issue remains how to choose the optimal frequency belt of the RFID-Tag system.

Originality/ Value -

This system contributes to show how amount is loaded by each owner in their transportation activities and bring a new marketing paradigm in which the customers can choose the goods based on the information not only their prices but environmental loads per good or owner.

Keywords: Environmental Sustainability, Green Logistics, Supply Chain Management.

Paper Type: Research paper

REAL TIME ASSIGNMENT OF CO2 EMISSIONS IN TRANSPORTATION PROCESS - A PROCESS IMPROVEMENT BY INFORMATION SYSTEM WITH RFID -

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ABSTRACT

Purpose

This paper aims to grasp and assign the CO2 volumes to each transported item in real time by developing a fuel gauge with an IC tag system (Yoshifuji et al., 2008) for environmental logistics and truck transportations. This is because the CO2 emissions in the transportation process are different by each trip condition depending on dynamic operations among owners, transporters and retailers. However, they cannot know the CO2 volumes in real time by the carbon footprint to improve their dynamic operations environmentally.

Design/ Approach / Methodology

This paper uses the fuel gauge with the IC tag system for the truck transportations. It consists of a fuel gauge for trucks, IC-Tags labelled on each item, RFID reader and writer, RFID antenna.

Findings

By using the information system with the RFID, the real time grasp and assignment were demonstrated by each item. Also, the potential benefits and promoted KAIZEN activities were summarized by the proposed real time grasp and assignment of the CO2 volumes. In addition, the CO2 assignment for the empty vehicles was treated, and the assigned method by the both transporter and owners was recommended for the empty vehicles.

Research limitations/ implications

The transportation data such as the speed, fuel efficiency and travel time for each section was obtained by a travel data simulator in the experiment. A future experiment requires an actual truck operation, and the both results between them are compared.

Originality/ Value - The major contribution is to develop the information system with the fuel gauge of the truck and the IC tag, and to demonstrate the real time grasp and assignment of the CO2 emissions in the truck transportations for the environmental logistics.

Keywords: Environmental Logistics, Fuel Consumption, Transportation Process KAIZEN, RFID.

Paper Type: Research paper

GREEN SUPPLY CHAINS: CLOSING THE LOOP, A CASE STUDY OF THE BIO-ENERGY INDUSTRY.

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ABSTRACT

Purpose

The purpose of this paper is to present the key findings from an investigation of the supply chain using renewable resources to generate electricity that supplies the national grid. Closed loop supply chains have been linked with measuring performance of reverse logistics channels (Fleischmann et al, 2003). Here, reverse channels add value by utilising product returns and end-of-life products but, in this case, the closed loop model is applied to investigate the sustainability and performance of the supply of renewable materials to fuel biomass energy plants.

Keywords: Supply chain performance, reverse logistics, biomass fuels biomass power station, timber industry.

SECTION 10 – Management of the Customer-Supplier Relationship

SUPPLIER SELECTION CRITERIA IN DIFFERENT PROJECT ENVIRONMENTS: AN EMPIRICAL STUDY

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ABSTRACT

Research in identifying the relative importance of criteria used to select a preferred supplier has, for the most part, relied on subjective lists of criteria being presented to respondents. This paper is a summary of the research conducted by the authors to quantify the importance of nine common criteria used in an actual evaluation and selection of a contractor/supplier. Unique choice sets were constructed, each comprising 3 tender evaluation outcomes (alternatives) described in terms of all criteria, but with varying levels. Respondents simultaneously evaluated all three alternatives within each choice set and selected the most preferred. Utility estimates for each criterion level were determined as was the overall contribution made by the individual criterion. Results indicate past project performance, technical expertise and cost are the most important criteria in an actual choice of contractor with organisational experience, workload, and reputation being the least important.

THE RELATIONSHIPS AMONG GLOBALIZATION, SUPPLY CHAIN INTEGRATION, AND BUSINESS PERFORMANCE: EVIDENCE FROM TAIWAN MANUFACTURERS

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ABSTRACT

Research Paper

When supply chain integration positively moderates the relationships between globalization and performance, it implies that the optimal performance caused by globalization can be improved by the technique of supply chain integration. This study tries to examine the moderation effect of supply chain integration on globalization and performance. Several moderated regression models were proposed with response variables of profit margin, return on assets, gross profit per employee, and unit labour cost. To further understand the issues of moderation effects, strategies of globalization were classified into production globalization and market globalization, while supply chain integration was categorized into internal integration, supplier integration, and customer integration. Our proposed models were empirically examined against Taiwan's manufacturers whose total assets were above 1 billion N.T. dollars, because large companies are more likely to practice supply chain integration or globalization. Findings indicate that supply chain integration with customers can positively moderate the relationships between market globalization and productivity performance.

Although external integration with suppliers positively moderates the relationships between market globalization and financial performance, such effects do not exist between production globalization and performance. Similarly, internal integration also has no positive moderation effects on the relationships between globalization and performance. All approaches of supply chain integration even show no moderation influences on production globalization and performance. Accordingly, the moderation effects of supply chain integration on globalization and performance were only partially proved from our observations. Our proposed models can help manufacturers to adjust or design their supply chain and globalization strategies for better performance. Although our empirical study only applied to the manufacturing industry, other sectors can adopt our approach to understand the moderation relationships among supply chain integration, globalization, and performance .

UNDERSTANDING RELATIONSHIP QUALITY AND ITS LINK WITH SUPPLY CHAIN PERFORMANCE – A REVIEW

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ABSTRACT

Purpose

This paper aims to advance the understanding of relationship quality in supply chains; and in particular to advance the understanding of its link with supply chain performance.

Design/ Approach / Methodology

A multidisciplinary literature review was undertaken to identify journal articles on relationship quality from the supply chain management, operations management, marketing, service management, organization studies and applied psychology literatures.

Findings

The paper reveals significant ambiguities in the conceptualization and empirical assessment of relationship quality. Although relationship quality is widely recognized as a higher order, multi-dimensional construct there is little agreement within or between the disciplines reviewed over the dimensions that comprise it. Secondly, and most importantly, this paper finds that empirical evidence for the connection between relationship quality and supply chain performance is inconclusive. Thirdly, this paper suggests that findings in the marketing, service management, organization studies and applied psychology literatures, provide fresh perspectives on the inconclusive link between relationship quality and supply chain performance.

Research limitations/ implications

The paper provides some implications for practitioners interested in enhancing the performance of inter-organizational relationships. The paper indicates that managers should avoid focusing on interventions designed to solely improve relationship quality. Managers, instead, should consider addressing supply chain performance more directly, for example, by introducing performance measurement systems in supply chains.

Originality/ Value

In building on these and other insights this paper offers new paths for research into the linkages between relationship quality and supply chain performance, such as conducting longitudinal and multi-level analyses to investigate the existence, and direction, of the proposed link between relationship quality and supply chain performance.

Keywords: Relationship Quality, Supply chain performance.

Paper Type: Literature Review

SECTION 11 – Design Configuration of Supply Chains

AN INTEGRATED MODEL FOR DESIGNING AND OPTIMISING A EUROPEAN LOGISTICS NETWORK: THE PIRELLI TYRE CASE

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ABSTRACT

Purpose of the paper

The present paper focuses on one of the most important issues in supply chain research: supply chain configuration and optimisation. The aim of this study is to propose a logistics network optimisation model, together with a series of methodological guidelines for obtaining and processing the necessary data, able to deal with real life supply chains problems and to manage a degree of complexity typical of a factual company environment.

Methodology

After an extensive review of the literature on linear programming models for supply chain configuration and optimisation (170 reviewed papers), we developed a mixed-integer linear programming model along with a data mapping scheme and, subsequently, we applied them to a real-life case study, i.e. the European Pirelli Tyre logistics network.

Findings

Based on the comparison of the outcomes of the model with budgetary data for the *as-is* logistics network configuration, the proposed model proved to be accurate and adherent to the actual figures of the considered company. We then solved the optimisation problem, obtaining significant results in terms of savings compared to the *as-is* situation.

Research implications

This paper significantly contributes to the growing debate on the adoption of models and decision support tools for designing and optimising supply chains and logistics networks.

Practical implications

By means of this study, we provide supply chain managers with a decision support tool for optimising the configuration of international logistics networks, able to keep into consideration real-life issues, complexity and constraints. Moreover, the enclosed methodological guidelines drive users in the complex, difficult and time-consuming data gathering and processing activities.

Originality

Our extensive review showed that previous literature is particularly wanting of exhaustive supply chain design and optimisation models, dealing with real-life complexity, practically implemented in realistic contexts and integrated with a data gathering and processing section as well. For this reason, the originality of our proposed approach is represented by the possibility to fill the gaps in the current state of the art, by means of an integrated design and optimisation model, practically applicable by companies.

Keywords: supply chain configuration, logistics network design, linear programming, optimisation models, physical distribution

Paper Type: Research paper

SUPPLY CHAIN AS A VIRTUAL ORGANIZATION: DREAM OR REALITY?

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ABSTRACT

Purpose

Virtual supply chains are frequently identified with e-business, computer communication and digital products. Within the framework of organization theory a virtual supply chain is more than that; it is an organization that is subject to constant changes, demonstrating a specific potential when required, overcoming time and space barriers. Virtual supply chains could be described by such attributes like temporary character, focus on customers, geographical dispersion, intensive support of IT systems, network structure and an extensive use of key competencies of their members.

The main research question addressed by the paper is: Are companies prepared to function within the frameworks of such virtual supply chains? What are the major actual barriers for efficient organization of VSC? The final answer to the main research question will also provide some guidelines for the future directions of research in the area of virtual supply chain management.

Design/ Approach/ methodology

The proposed paper defines the concept of a virtual supply chain (VSC) and indicates how its characteristic features fit into the current reality of economic crisis. Temporary character of VSC allows for collaboration of firms during specific required ventures. Members of VSC can operate in different dynamic business networks and activate new ones according to emerging business opportunities and specific customers. VSC must have an extensive ITC support to be comparatively independent of location aspects of operations. Operational structures of VSC drive apart from traditional hierarchical structures towards horizontal and cooperative relations in the networks based on expertise and abilities of their dedicated members.

That research question has been answered by discussing results of the survey completed by the group of 121 manufacturing, distribution and service companies in the southern part of Poland. The questionnaire tested several variables describing the major aspects of virtual supply chains. On the basis of these variables, the current status-quo presented by the survey's respondents has been discussed.

Findings

Reported research indicated that surveyed companies are not quite ready to create efficient virtual supply chains. Information and communication technologies seem not to be responsible for that. Even if some shortcomings occur in that field they probably might be immediately eliminated either through additional investment or employees qualifications. Specific barriers against the use of ICT were difficult to be identified.

The most important reasons limiting more frequent adoption of virtuality in supply chain operations lie in the field of traditional approaches adapted by companies in the field of logistics operations. At the same time logistics service providers do not offer diversified and complex services suitable for temporary and discontinuous business.

Research limitations / implications

Whenever the physical character of a product is in place, ICT cannot handle it alone. Due to physical character of most of product deliveries wider scope of use of virtual supply chains will be still difficult for long time. Therefore alternative flexible delivery systems should be the subject of further logistics research. These areas require further exploration with adoption of the

concept of virtual logistics, based on shared resources increasing the efficiency of small sized deliveries.

Originality / Value: The major contribution is a practical verification of factors contributing to creation and functioning of temporary supply chains operating in the environment of discontinued business processes. The main gaps between the requirements for proper virtual supply chain and the real conditions of operating businesses were identified.

Key words: virtual supply chain, virtual logistics, logistics competencies

Paper type: Research paper

ROLE OF LOGISTICS SERVICE PROVIDER IN SUPPLY CHAIN BETWEEN MANUFACTURER AND SUBCONTRACTOR

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ABSTRACT

This research focused on studying role of logistics service provider in a Finnish machinery industry supply chain between a manufacturer and a subcontractor. This research was started by searching arguments and industry driven needs for utilizing the service provider in the studied supply chain. Based on the results of the first research phase, a logistics service provider role model was generated. The model includes six different roles for the service provider: *improver of operational logistics efficiency, operational decision maker, value-adder, production maker, supply chain manager and developer, and enabler of business growth*. The developed role model was tested by four logistics service providers' client relationships. In general, the studied service providers worked on operational tasks between the manufacturer and the subcontractor. This means that they can be placed at the first of two roles mentioned above. One studied service provider made an exception to this general line by operating with some clients as the production maker, the supply chain manager and developer, and even as the enabler of business growth. This indicates that there is potential market demand for service providers even in strategic supply chain management role.

Keywords: outsourcing, logistics service provider, supply chain management

AN EXPLORATION OF THE SUPPLY CHAIN DESIGN AND ORGANISATION OF THE UK CARAVAN MANUFACTURING INDUSTRY

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ABSTRACT

Purpose of this paper

The study focuses on the supply chain of the UK caravan manufacturing sector. The principal output from this exploratory research is to determine the key challenges currently facing the industry during the economic downturn to provide a foundation for developing research questions for a future more in depth study of the sector.

The principal academic question addressed is whether in pursuing a supply chain management strategy are, production, marketing and inter-firm relationship orientations independent of each other or are they inter-related and consequently need to be balanced off against each other?

Design/methodology/approach

The research is case study based, undertaken via site visits with data collected through observations, analysis of sales and production figures, interviews and semi structured questionnaires.

Findings

In pursuing a supply chain management strategy it is important to consider that production, marketing and inter-firm relationship orientations all need to be balanced. These three paradigms do not appear from this study to be independent as questioned by Lehtinen (1996). Although leading members of the UK caravan manufacturing sector have stated in this research that they are market orientated, in facing up to the current challenges they are actually tackling the underpinning basis of each of these three paradigms to try to deliver workable solutions to secure the future of the industry.

Research limitations/implications (if applicable)

The research is only exploratory and case study based focussing on one sector. For more generic implications to be addressed a wider study should be undertaken and this would permit greater validity of the principal research findings.

Practical implications (if applicable)

The research is also innovative in that very few previous academic studies have been undertaken in this sector, while the study has generic significance, as the caravan manufacturing industry has many similarities to other business sectors.

What is original/value of paper

The research concludes that in the case of this sector an understanding of the trade off issues which exist between each of the three orientations is important in developing appropriate supply chain management strategies.

Category: Research Paper

COMPONENTS, SUBASSEMBLIES AND OEMs: THE ROLE OF TIER ONE SUPPLIERS IN RECONFIGURED SUPPLY CHAINS

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ABSTRACT

Purpose

Supply Chain Management adopts a holistic view of not only the organisation but of the entire process of product/service inception, production and delivery in a seamless fashion across organisational boundaries. The motivation to pursue this integrated strategy goes beyond cost reduction and seeks to create competitive advantage. Thus firms' use of supply chain management often evolves from an operational to a strategic level. This follows a Resource-Based View of the firm (RBV) where firms specialize on core competencies and develop close relationships with other specialist firms that perform other key functions along the supply chain.

Design

A case study methodology was adopted to investigate the impact of OEM (Original Equipment Manufacturer) specialisation on tier one supplier strategy. The case company is a multi-billion dollar precision engineering multinational organisation that supplies OEMs across a range of industries. A participative research approach was adopted that involved two stages: (i) a case study selection phase entailed discussion with company executives and review of company documentation, and (ii) a research workshop involved 49 senior managers from the company's global community in supply chain and other supporting functions such as operations, finance and programme management.

Findings

We find evidence to support changing supply chain strategy and configuration in response to core competency development. The case company sought to develop supply chain relationships in order to capitalise on suppliers' processes, technology and capabilities and in turn expect OEM customers to do likewise – i.e. the firm's success is a function of its suppliers' capabilities. In summary two key dimensions emerge from the workshop discussions: (i) relationship category based on the complexity of the product/service and (ii) knowledge management systems to support relationship development and operation.

Value

This case provides an interesting insight into the drivers and impact of changing supply chain configuration at tier one supplier level. The approach taken reflects supplier relationship typologies found in the literature; however the strategic interest in developing a competency in this area is of particular interest. The case study company involvement in knowledge-based networks was largely a function of their need to specialise in a particular area which in turn increased their need to co-operate with other firms specialised in complementary functions. It was evident that as firms position themselves to take advantage of changing supply chain configurations, more complex and diverse networks emerge in comparison to the hub-and-spoke type networks traditionally associated with sub-contracting and leader-firm networks based on market power. The case study firm was found to serve a number of OEMs and build supply pipelines with firms that were also engaged in other networks. While these are rather tentative findings arising from one case study nonetheless the core competency hypothesis motivating this research yields much food for thought, in particular the need to better understand sources of competitive advantage arising from inter-organisational networks. These observations also prompt us to consider governance of such networks.

Category: Case Study

SECTION 12 – Reverse Logistics

AN INTEGRATED MODEL FOR PRODUCT RETURNS IN REVERSE LOGISTIC NETWORKS

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ABSTRACT

Purpose

This paper studies the problem for manufacturers to decide the collection methods for collecting the used products, at the end of the product life, from the customers. Specifically this study aims to develop a location-allocation model for the manufacturer's reverse logistics network to maximize the profit. Our study is motivated by the need for analytical approaches that foster an in-depth understanding on the simultaneous implementation of three collection methods namely the drop off, pick up and mail return.

Design/Approach/Methodology

A mixed integer non-linear programming model integrating the three collection methods is proposed to achieve the objectives. The model is to decide the number and locations of collection (drop-off) centres in manufacturer's reverse logistics network, the collection method for each customer zone and the amount of incentives offered for returning products.

Findings

In this study we developed a facility location-allocation model for manufacturers to consider different product collection methods simultaneously. The model also includes requirement by government regulations in the form of minimum collection rates. The relationships between incentives and proportions of returns for each collection methods are also included in the model. The model can potentially give better results than models only consider one collection method. Nonetheless, the model is nonlinear and involve integer variables and hence is hard to solve. We are currently working on the solution of the model with some test data.

Originality/value

The major contribution of this study is the development of an integrated facility location-allocation model consisting of different collection methods. The choices among different collection methods are allowed, requirements by government regulations are addressed and the relationships between the incentives and the proportion of products returned are considered.

Keywords: Reverse logistics, product recovery network design, product returns, collection methods, location-allocation problem

Paper Type: Research paper

CAPACITATED LOCATION-ROUTING AND BALANCED ALLOCATION IN REVERSE LOGISTICS NETWORK

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ABSTRACT

Purpose

Reverse Logistics (RL) is a timely and relevant topic for both academics and practitioners. Some of the major issues in reverse logistics are determining the location of Temporal Collection Points (TCP) and Centralized Return Centers (CRC), allocating recoverable products to CRCs and manufacturing processes if required and finally finding optimal routing patterns between all stages from customers to processing center where RL processes will be carried out. We contribute to the literature by integrating all the three decisions pertaining to Location, Allocation and Routing using a mathematical model, commonly referred to as CRAB (Capacitated Routing and Allocation with Balancing constraint).

Design/ Approach / Methodology

To solve this CRAB problem, a decomposition methodology has been adopted. The paper decomposes CRAB models into three sub problems i.e (i) Capacitated Centered Clustering Problem (CCCP), (ii) Location-Balanced Allocation Problem (LBAP) (iii) Traveling Salesman Problem (TSP) with the assumption that the vehicles and centralized return centers have limited capacity as well as probabilistic approach has been adopted to select suitable RL process for particular product.

Findings

Optimal allocation of CRC to TCPs in a balanced manner and optimal vehicle routes from processing center to CRCs, CRCs to TCPs, as well as from TCP's to customers with the overall objective of minimizing total cost. Performance is tested with data sets retrieved from standard sources. The results from this model would help practitioners to develop efficient reverse logistics networks.

Research limitations/ implications

This work can be extended by taking into account inventory related costs, stochastic demand, dynamic pricing and incentive price paid to the collecting agents. Return of multi-product and multi-objective aspects are not taken into account in the CRAB model. The co-ordination of two markets such as supply side (returns) and returns disposition may also be taken into account in future studies.

Originality/ Value

The paper integrates all the three decisions pertaining to Location, Allocation and Routing using a mathematical model and develops a CRAB model for reverse logistics network. Due weightage is given to importance of issues such as balanced utilization of resources, processes to be selected beyond using cost as the only criterion.

Keywords: Reverse Logistics, Location-Routing, Clustering, Balanced Allocation, remanufacturing

Paper Type: Research paper

RISK MANAGEMENT IN THE REVERSE SUPPLY CHAIN NETWORK

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ABSTRACT

As supply chains become more complex, the uncertainties and risks affecting the other links in the chain increase. The key issues in both forward and reverse supply chain are the formation of an effective supply network to ensure customer satisfaction and sustain capability. This requires the coordination of information, materials, and funds across multiple functional areas both within and among companies. To achieve this, companies must identify, evaluate, rank, and manage its supply chain risks. As supply chains become more complex, the uncertainties and risks affecting the other links in the chain increase. The paper focuses on the creation of a new risk management tool to help industries improve their material flow efficiency within their reverse supply chain. The purpose of the proposed risk management tool is to assist organizations in better preparing themselves in case certain risks occur. The framework developed helps monitor the reverse supply chain, specifically identifying, quantifying and managing potential risks.

The conceptual framework is then implemented using case examples from the high tech industry sector. In order to accurately quantify potential risks, a sensitivity analysis is performed on various possible risk quantification methods, in order to determine which formulation had the most accurate risk impact score. The tool is designed to be easily implemented at minimal cost and serves as a valuable tool for personnel faced with important and costly decisions regarding risk occurrence in the reverse supply chain network. This is an effective method for developing alternatives quickly and efficiently in the least amount of time without previous risk management experience.

REVERSE LOGISTICS PERFORMANCE IN THE THAI AUTOMOTIVE INDUSTRY

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ABSTRACT

Purpose of the paper

This paper attempts to explore the factors that influence the reverse logistics performance. Supply chain integration is proposed as the key influencing construct of the reverse logistics performance model.

Design/ Approach / Methodology

A questionnaire survey was conducted. First-tier suppliers of the major car manufacturing firms in Thailand were targeted. The total of 234 sets of data was gathered. Structural equation modelling was utilised to analyse the data empirically.

Findings

External and internal integration as well as supply chain orientation were found to significantly influence reverse logistics performance. Information system support and resource commitment can influence reverse logistics performance indirectly. Supply chain orientation, information system support, and resource commitment lead a firm to initiate and develop external and internal supply chain integration.

Research limitations/implications

Scope of reverse logistics in this study focused only on product returns caused by certain reasons such as defective product and faulty order processing. Other reasons for returning products were excluded. Also, this research was done in a single industry context so the generalizability of the findings to other industries may be questionable. Researches in other context may be done to expand the external validity of the model.

Practical implications

To improve performance of reverse logistics process, a firm must focus on both external integration and internal integration simultaneously. External integration should be done on both supplier and customer sides to guarantee that the reverse logistics operation will run smoothly throughout the supply chain.

Originality/value of paper

This study is probably one of the first attempts to investigate the effect of supply chain integration on reverse logistics performance. A structural relationship among key constructs was developed based on the arcs of integration concept proposed by Frohlich and Westbrook (2001) in the context of reverse logistics.

Keywords: Reverse logistics, Performance measurement, Supply chain collaboration, Internal & external integration

Paper Type: Research paper

SECTION 13 – Distribution and Third/Fourth Party Logistics

LOGISTICS CITIES: A SPATIAL REQUIREMENT FRAMEWORK

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ABSTRACT

This paper focuses on issues surrounding the spatial requirements of a Logistics City, and the contributing investigation, in cooperation with various planning authorities in Melbourne, has been conducted on characteristics and attributes related to this concept. The spatial requirements identified here are segregated into four different layers as a framework which will contribute to the understanding of the behavioural patterns of spatial factors related to a Logistics City. This will enhance the ability of development authorities to support the planning and introduction of a holistic Logistics City and has the potential to improve the quality and effectiveness of these systems in a growing regional economy.

Keywords: Logistics City, Logistics Spatial Requirements, Logistics Cluster, Spatial Framework

THE PROGRESSION TO LOGISTICS CITY AND ITS IMPLICATION OF ECONOMIES OF AGGLOMERATION

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ABSTRACT

Purpose of this paper

This paper identifies the essential activities at logistics facilities and describes the progression of these facilities to logistics city. The impact of the progression on economies of agglomeration is analysed, the practical implication is presented, and the need for government initiatives, intervention and coordination as a catalyst is explained.

Design/methodology/approach

Based on the sophistication of logistics facilities progression, the essential activities at various logistics facilities are collected and the impact on economies of agglomeration is analysed.

Findings

This paper finds that while agglomeration economies explain past development, agglomeration forces alone are insufficient and government intervention is required as a catalyst. This may be in the form of the development of a common user freight terminal with intermodal and customs capability, e.g. inland port to aggregate consolidation/deconsolidation activities.

Research implications and limitations

The identification of essential activities of logistics facilities can minimise or prevent inappropriate uses of these facilities to ensure effective and efficient logistics services planning and high utilisation of transport infrastructure. The impact analyse of economies of agglomeration points out the role a government should play in logistics facilities development.

Value of paper

The paper identifies essential activities for logistics facilities and therefore makes it possible for governing agencies to plan and protect the development of logistics facilities and ensure high utilisation and effective usage of such facilities. The gap identification of economies of agglomeration ensures tangible economic benefits can be achieved through appropriate government supported logistics facility developments.

TRANSPORT RELIABILITY OF CONTAINERISED AGRICULTURAL GOODS FROM THAILAND TO CHINA: A SHIPPERS' PERSPECTIVE

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ABSTRACT

Ever since the early 1990s, the Chinese economy has grown at an annual average rate of 8 percent², representing the greatest sustained growth period in recent times. Several neighbouring countries, such as Thailand, have oriented their transport systems towards coping with the dynamism of trade in the Chinese import and export market. However, in the current international trade climate, significant adjustments in the trade patterns have focused attention on issues of reliability and the long-term sustainability of trade and transport. This is especially true in the agricultural sector, where transport patterns vary according to cost, time, seasonality, exchange rate, business relationships and market accessibility factors. These factors are considered to be the main determinants of decisions concerning transport corridor, modes, methods, and selection of transport carriers. The type and nature of the cargo itself, and the volumes of cargo shipped are also potentially very important.

In this paper, a case study of over 100 containers of agricultural goods from North of Thailand to Southeast of China was monitored through measures of cost and time, along with 34 survey responses of service and quality. The purpose of this study is to evaluate the factors affecting choice of routes and modes in between the selected corridor. A "Fast Track Transport Measurement" (FTTM) matrix was proposed in evaluation of the reliability of a given transport corridor. As a result, cost factors turned out to be the key transport decisions for trade between Thailand and China rather than service or quality of transport.

Key words: Transport Reliability, Agricultural Goods, Thailand, and China.

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² Source from ADB: <http://www.adb.org/media/Articles/2007/12084-chinese-economics-growth>
[Accessed on 10 April 2009]

THE CHALLENGE OF DECISION MAKING IN INTERMODAL SUPPLY CHAINS

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ABSTRACT

Purpose of this paper

The aim of this paper is to create a new common knowledge for a decision support system needed for intermodal operations, especially from the operator point of view. This paper analyses requirements for a decision support system coming from the intermodal operator and other stakeholders in the supply chain. Our target is to develop a decision support system based on the analysed requirements. The system to be developed will contribute the competitiveness and success of intermodal operators in European and global supply chains.

Methodology

The research is based on the single case study according Yin methodology. The semi-structured interviews with the personnel at the intermodal operators and the stakeholders are the main means to collect information. Inconveniences, bottlenecks, problems and future requirements are identified together with the experts in the stakeholders' organizations. The findings are turned to both business and technology requirements for the system to be developed. This paper is focused in the requirements phase of the project.

Findings

The European transport policy as well as national transport policies aim at increasing the market share of more environmentally friendly transport modes (rail, inland waterway and short sea shipping integrated into intermodal transport alternatives). There are exceptionally many players involved in the intermodal transport, and for this reason a fluent information flow and the transparency of the transport process including the management support, are absolutely crucial.

Our focus is in the intermodal operator's role in the transport chain. The intermodal operator is a company, which is responsible to manage intermodal door-to-door shipments processes.

The managerial and operational decision making is challenging for the intermodal operator because of the lack of information about the overall process. Some stakeholders, like rail operators, provide track-and-trace solutions, but these individual solutions are not integrated into a common system. When you operate hundreds of deliveries at the same time, it is not possible to use individual solutions for follow-up and decision making. This paper is about creating a new common knowledge for a decision support system needed for intermodal operations. This paper analyses requirements for a decision support system coming from the intermodal operator and other stakeholders in the supply chain.

What is original/value of paper

There is a huge potentiality in the intermodal transport for taking bigger role in global transportation chains. With intelligent cargo solution and advanced decision support system could be improved the cost efficiency, visibility and supply chain level operations in intermodal transport processes. Our development of new innovative ICT solutions will contribute in the success of intermodal transport in the future.

TOWARDS A METHOD OF DESIGN AND GOVERNANCE OF A LOGISTICS CITY TO SUPPORT SUPPLY CHAIN MEMBERS

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ABSTRACT

Purpose: This research examines the design and governance of a 'logistics city' which exists to provide logistic and business services to manufacturers, distributors and transport companies in an international supply chain. It considers how the governing body of such a city will help the players involved to achieve their business objectives. A logistics city is defined as a concentrated area attached to a seaport and other cargo transport modes.

Approach: The parameters which are considered likely to influence the choice of the preferred type of governance are set down. The governance methods available are described. The research reviews existing 'logistic cities' and port cities containing *de facto* logistics cities to ascertain how they are governed and how effective they are. The logistics cities found are arranged on the 'driving' parameters to ascertain what clusters are formed.

Findings: Recommendation that the body responsible to govern a logistics city should be market reactive and incorporate a public/ private partnership.

Practical Implications and Value: The findings can be applied to future logistics cities in Melbourne and other suitable sites throughout the world.

NEW INLAND TERMINALS - IMPORTANT STEPS WITHIN THE DEVELOPMENT OF THE PORT OF KOPER

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ABSTRACT

With the European Union growing eastwards and by the establishment of important production facilities in the countries of Central and Eastern Europe, the hinterland potential is bound to grow even more. The strategic goal of the Port of Koper is to become one of the best ports in the southern Europe to develop from a handling port into a commodity distributional centre. Penetrating and exploiting these markets demands cooperation with existing inland terminals (logistic centres) and establishing of new ones positioned between Eastern and Western Europe (Adria Terminali, regional logistics center "Panonija", inland container hub-rail port Arad, Romania...).

This paper aims to present: (I) supply chains of the flow of goods through the Port of Koper to/from the countries of Central and Eastern Europe (II) the current state and strategies to optimize the flow of goods, (III) market potential, investments in new terminals and capacities.

Key words: Port of Koper, strategies, goals, supply chains, new terminals, market potential, investments, competitiveness

LOGISTICS AND TRANSPORTATION OF PERISHABLE GOODS IN PORT OF KOPER

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ABSTRACT

In the last decade the growth of import and export of fresh fruit and vegetables in Europe was about 8 % per year with the trends of further growth. The main characteristic of the fruit and vegetables industry is a need to meet delivery deadlines in a very short time and reduction of total costs. Creation of logistic platforms is one of solutions to improve efficiency. In the paper will be analyzed the new logistic model for distribution of highly perishable goods in the Port of Koper.

KEY WORDS: perishable goods, logistics, Port of Koper

LONGEVITY OF TECHNOLOGICAL COMPETITIVE ADVANTAGES FOR LOGISTICS SERVICE PROVIDER? A COMPLEXITY SCIENCE BASED ANALYSIS OF AUTONOMOUS CO-OPERATION TECHNOLOGIES

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ABSTRACT

Purpose of the paper

Logistics markets, embedded in so-called International Supply Networks (ISN), are characterised by an increasing rivalry, caused by a high amount of competitors, increasing costs and the homogeneity of offered services. Due to that, a logistics service provider has to offer special "value added services" in order to gain competitive advantages by differentiating from competitors. This can be achieved by implementing autonomous co-operation technologies. However, due to possibilities to imitate or substitute technologies, the longevity of these advantages is in doubt. Therefore this conceptual paper intends to discuss positive as well as negative impacts on the longevity of technology based competitive advantages resulting from path dependencies.

Design/ Approach / Methodology

The paper uses the concept of autonomous co-operation as an example for technologies, which might lead to competitive advantages. Furthermore, the concept of path dependencies as well as complexity theoretical approaches are used to identify positive as well as negative impacts on the longevity of those technology based competitive advantages.

Findings

The effects that emanate from technological path dependencies on the longevity of technological competitive advantages can vary in the range of positive as well as negative impacts on the level of ISN and of one single company.

On the level of ISN one positive effect can be an increasing capability of the whole system (ISN) to differentiate itself from other ISN, which might result in an improvement of the system's stability. Additionally, one exemplary negative effect might be a reduced innovation-capability of the whole system. On the level of individual logistics service providers, exemplary effects are economies of scale based on inter-corporate learning (positive effect) and a reduction of technological-based options for a strategic differentiation on the long run (negative effect).

Research limitations/ implications

General statements about the influences of path dependent phenomena on the longevity of technological path dependencies cannot be derived due to uncertainties regarding the overall net effect. Therefore, general implications for the management of logistics service providers cannot be given. Nevertheless, the shown positive as well as negative impacts on the longevity of a technological-based advantage of an ISN or a logistics service provider have to be taken into account for strategic investment decisions about the development and implementation of technologies. Further research is needed in order to provide a logistics management with methods and instruments that allow evaluating technologies regarding their strategic implications.

Originality/ Value

The paper provides insights into possible effects of technological path dependencies on the longevity of competitive advantages based on autonomous co-operation technologies. Therefore, it might be of value for decision makers in order to evaluate decisions regarding investments into suchlike technologies.

Keywords:

logistics service provider, autonomous co-operation, competitive advantage, technology, path-dependency, heterogeneity

Paper Type:

Conceptual paper

Acknowledgement

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SIGNIFICANT VALUE-ADDED ATTRIBUTES IN PORT LOGISTICS CHAIN-SYSTEM

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ABSTRACT

Purpose – The theme of this study is to identify and prioritize value-added attributes in the port logistics chain-system, specifying significant value-added attributes revealed by various domain perspective.

Design/methodology/approach – To prepare this paper, literature sourcing covered six journals and two textbooks, only peer-reviewed articles and textbooks addressing the port in global logistics arena and supply chain discipline published within the period 1998-2008 were selected. On this basis Delphi technique implemented to rank the identified value-added attributes from experts' opinion and to downsize their number, in order to suite Analytical hierarchy process AHP model. Followed by pair-wise comparison to determine the significant attributes from the port key management perspective. The data collected for pair-wise comparison was conducted throughout semi-structure interview, in order to explain the presumed methodology and to eliminate potential bias.

Finding – The aggregate result from the work cluster analysis shows that information communication value is the most valuable attribute according to both experts and port decision makers. Other consensus among experts and port key management indicate that access to distribution network, logistics and transport integral facility and reliable customs clearance services are the most rewarding value-added among other attributes in category two. The study presents a framework for prioritizing the identified value-added attributes and insightful method for ranking for ranking purpose.

Practical implications – The study identifies and classifies the value-added attributes related to the port logistics chain-system. The applied methodology might enhance port key management to discover the most rewarding value-added attributes and value relevance as a source of competitive advantages.

Originality/value – This paper combines both literature analysis and interviews with experts and decision makers, which offers an integrated framework of cluster analysis. It is assumed to adds value to the port logistics and supply chain literature by identifying and categorizing an important set of value-added attributes. Finally the study combines different methods, in order to reveal various respondents perspective.

Keywords – Analytical hierarchy process; Delphi Technique; Value-added attributes; Chain-system; Decision maker.

Paper Type – Research paper.

EFFECT OF GETTING BACKHAUL LOADS IN LONG-DISTANCE TRANSPORTATION

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ABSTRACT

In Japan, there are a lot of load finding services through the Internet. However, truckload carriers do not have clear criteria of decision making about getting backhaul loads. We have presented a simple backhaul model connecting 3 points. We clarified the criteria of decision making along the model. And we found that a criterion of load efficiency contributed to the reduction of CO2 emissions and the increase of contribution margins. In this Paper, we generalize our logic with a simple backhaul model connecting 6 points. The model includes highway interchanges. Moreover, we execute a numerical experiment in long-distance transportations. As a result of the experiment, we reconfirm that a criterion of load efficiency contributes to the reduction of CO2 emissions and the increase of contribution margins.

EFFECT ANALYSIS OF ABANDONMENT PALLET CAUSING AT PUBLIC TRUCK TERMINAL BY VSP METHOD

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ABSTRACT

In Tokyo, 4 public truck terminals have contributed to solving some environmental problems in the Tokyo metropolitan area by their transshipment function. However, their transshipment function caused new environmental problems. One of the typical problems was the increase of the number of abandonment pallets. The public truck terminals needed to dispose of their abandonment pallets in low cost and low environmental impact. In this paper, we focus attention on the abandonment pallet transportations from the 4 public truck terminals to a disposal trader. We propose a new transportation plan led by the IBM VSP method. The new plan is effective to reduce transportation costs and CO2 emissions.

SECTION 14 – Transport and Distribution Performance

INTERMODAL COST-TIME TRADE-OFFS

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Topic Area: Decision Support Systems and Communication Technologies

ABSTRACT

Deciding on the shipping route and mode of transportation (land, sea and air transportation), for goods to be exported is a dynamic process. Changes in production schedules can result in either the earliness or tardiness of goods available for the shipment. Similarly, changes in the shipping schedule and rates from service providers do not allow a fixed solution to expediting goods delivery. The need to maintain overall schedule consistency downstream in a supply chain can be seen as a further constraint on availability of choices.

Besides the need to depart from the origin and arrive at the destination, within specified time windows, the criterion of cost also plays a role on shipment decision. For example, when faced with earliness of production, a shipper can choose the lowest cost route to achieve consistent schedule downstream to destination as well as to decrease the pipeline inventory. On the other hand, when a shipper faces a production delay, to maintain a consistent schedule downstream, the shipper is to expedite the goods.

This paper seeks to simulate the twin effects of lowest cost and shortest time routing for air / sea transportation. The challenge was to reduce the cost without a disproportionate in transit time. The need comply to the vessel and flight schedules adds a scheduling component to the problem. A modified Dijkstra's algorithm was used to determine the best route be it in terms of cost or time. Constraint propagation was used to make the problem more scalable.

The data used for the system were from various sources. The Flight schedules were retrieved from Singapore Airlines regular flight schedules from April 1, 2008 to May 31, 2008. The Vessel Schedules were retrieved from Maersk's vessels' schedules from April 1, 2008 to May 27, 2008. The Ocean Freight charges were retrieved from Maersk's website. The Air Freight charges among airports were assumed as lowest cost between two respective seaports departing on April 1, 2008.

The problem defined thus had 26 airports and 41 seaports with 52 arcs connecting airports and 170 arcs connecting seaports. Airport to seaport transfers and vice-versa were only allowed in cases of close proximity.

An interactive user interface was developed to advice the user on the most effective path and schedule based on multiple preferences of cost and urgency.

The results obtained were consistent, with a cost-averse user's requirements leading to longer shipping times and lower utilization of airports. We were able to find alternative solutions which were in principle better than the lowest cost and shortest time alternatives.

Keywords: Intermodal, Cost - time

DEFINING 'EXTRA DISTANCE' AS A MEASURE TO EVALUATE ROAD TRANSPORT PERFORMANCE

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ABSTRACT

Purpose

In logistics research, there has been a focus on measuring the absolute performance of road transport operations. However, there have not been any studies assessing the marginal impact of supply chain disturbances on the sustainable performance of such operations. This paper introduces the concept of 'extra distance' as a means of assessing the marginal impact that deviations from the transport plan have on the economic and environmental performance of road transport.

Design/Methodology/Approach

'Extra distance' has been defined as the difference between the distance vehicles actually run, and the distance they would have needed to run if the transport network operator had received accurate and timely information on the volumes to be moved, and there had been no unforeseeable disruption within the delivery process. The concept was initially developed by the authors and then refined by key staff of a distribution business in the UK. The measure was then tested first in the same UK distribution network and subsequently in a South African network.

Findings

Five causes of 'extra distance' within existing or additional trips have been identified:

- Optimal Route Diversion to minimise delay as a result of unplanned road congestion.
- Delays at stores, suppliers or in unplanned road congestion, resulting in the vehicle missing the next load allocated to it, which then has to be re-planned in a sub-optimal way at short notice.
- Load More Than Advised resulting in short notice planning of the additional volume which is then moved in a sub-optimal way.
- Load Less Than Advised meaning unnecessary distance or trips has been run as the actual load could have been moved on fewer or shorter trips.
- Distribution Network Failures in either planning or operations, leading to sub-optimally planned short-notice movements of the affected product.

Research Limitations/Implications

Future research will see the 'extra distance' concept further tested in other transport operations and industrial sectors. 'Extra distance' due to optimal route diversion was not identified within the case studies, and it may in future be possible to address this by accessing telematics data from vehicles.

Practical Implications

This paper looks instead at the impact of disruptions rather than on supply chain developments that change behaviours and structures. 'Extra distance' can be a useful measure for both academia and industry, and in the case of the former, it builds on the existing 'lean thinking' literature and applies it to a new domain. For industry, the diagnostic approach enables areas of improvement to be identified.

Originality

Through an inductive approach, this paper presents a novel tool for assessing the waste caused by uncertainty within freight transport operations. The concept of 'extra distance' as a measure has been defined, and through its development and application within two empirical settings in the FMCG sector, five causes of 'extra distance' have been identified.

Key words: 'extra distance', diagnostic tool, FMCG distribution network

EFFECTIVE MEASURES FOR LOGISTICS SERVICE PROVIDERS TO RESPOND TO INCREASED OIL PRICES

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ABSTRACT

The rapid increase in oil prices worldwide since April 2004 has considerably affected the trucking industry in Japan. The trucking companies have been facing a marked increase in fuel cost, which seriously damaged their management. So, the increase in fuel cost has become the most important problem for trucking companies. They had to deal with it intensely and carried out several measures in order to survive. In this paper, by utilizing questionnaire surveys and an interview survey, we are going to make clear what kinds of measures were adopted by trucking companies and which measures were more effective in coping with fuel cost increase. The purpose of this study is to examine the effectiveness of those measures. Now the problem of fuel cost seems to have been dissolved, because oil prices have decreased rapidly since August 2008. However, analyzing the measures against fuel cost increase remains quite valuable even now because there is a possibility that the increase in oil prices will occur again in the near, and those measures are also effective in order to reduce CO₂ emissions causing global warming.

INVESTIGATING THE ENABLERS AND BARRIERS FOR INTRODUCING PORT-CENTRIC LOGISTICS WITHIN THE INDIAN LOGISTICS NETWORK

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Purpose of this paper

A previous study carried out by the authors (Galhena, et. al. 2008) provided an input in terms of the bottlenecks in India's port interface. The factors that emerged from this study were; port capacity limitations, insufficient investment, bureaucracy and port inefficiency issues. Some UK ports have introduced Port Centric Logistics (PCL) to overcome similar challenges with some success. This paper examines the enablers and barriers to introducing this concept in India's container ports as a solution to its acute congestion related bottlenecks.

In the above context the research questions for this study are:

- 1) Can 'Port-Centric Logistics' be implemented in India?
- 2) What are the enablers and barriers to implement 'PCL' in India?

Design/methodology/approach

In order to obtain a better insight into the factors affecting this study and the ground situation, the methodology adopted for this research was qualitative in nature. Interviews were conducted with four senior executives of ports/container terminals and an academic/consultant who has carried out a large number of Indian port-related studies/projects. This was coupled with an analysis of literature in the area of Port Centric Logistics. The interviews were recorded and transcribed, for diagnostic purposes and analysed using grounded theory principles.

Findings

The data analysis provided themes for further research. Based on the data analysis, three scenarios are identified which will influence the decision of the users (of maritime logistics) to implement 'PCL'.

Research limitations/implications

The main limitation of this research has been a sample of only 5 interviews for data analysis. However, these have been conducted with senior executives within the Indian port environment and have provided an important insight into the enablers and barriers for Port Centric Logistics. Further research needs to be conducted with a larger sample to get a more focussed and detailed insight.

What is original/value of paper

The paper delves into the topic of Port Centric Logistics which is new to the Indian maritime logistics environment. The paper considers perspectives from senior executives within the Indian ports and derives themes for further research.

PERFORMANCE IMPROVEMENT IN INTERMODAL FREIGHT TRANSPORTATION SYSTEM THROUGH EFFICIENT COLLABORATIVE TRANSPORTATION MANAGEMENT

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ABSTRACT

Information-enabled collaboration between trading partners not only simplifies the processes of planning, execution, monitoring and completion, and also provides cost reduction and value enhancement throughout the logistics chain. Nevertheless it is not easy to perform a transparency due to fact that trading partners are still reluctant to share information, as data sharing is perceived as a competitive threat. Therefore they perform unwilling acts for the collaboration. Moreover the impact of collaborative planning and management often cannot be understood sufficiently by trading partners in theory because of lacking of high safety and reliability levels.

This paper empirically investigates key competitive performance outcomes and key success factors in terms of collaboration in intermodal freight transportation system and it reveals the importance of efficient *Collaborative Transportation Management* (CTM). Survey data from both transport users (e.g. manufacturer) and transport service providers (e.g. carriers, logistics service providers, logistics service intermediaries) was analyzed using techniques from *Partial Least Squares* (PLS), a structural equation modeling method. The study points that efficient CTM in intermodal freight transportation is depending on key success factors; the shipper-carrier relationship, long-term orientation and satisfaction, the quality of information and communication technology system and the intensity of joint information sharing. Furthermore, the result of the study shows that increased customer service level, increased revenue, improved inventory level and reduced costs are key competitive performance outcomes of the efficient CTM.

Keywords: intermodal transport, collaborative transportation management; CTM, Partial Least Squares; PLS

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