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ABSTRACT BOOK

9th International Conference on Operations and Supply Chain Management (OSCM)

15 – 18 December 2019

Ho Chi Minh City, Vietnam

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Institut Teknologi Sepuluh Nopember (ITS) is one of top five universities in Indonesia. Established in 1961 as a public university, ITS has a primary focus on science and engineering, but recently also widen to the fields of design and business. ITS Campus is located in Surabaya, the capital of East Java Province. With a large number of alumni, ITS has contributed much to the country development. ITS is strong in many research areas and one of the pioneer in the area of Operations and Supply Chain Management.

ABSTRACT BOOK

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The 9th International Conference on Operations and Supply Chain Management (OSCM) is hosted by the collaboration of RMIT University, Vietnam and Institut Teknologi Sepuluh Nopember (ITS), Indonesia

RMIT UNIVERSITY VIETNAM

ITS Institut Teknologi Sepuluh Nopember

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Message from the conference chairs

The 9th International Conference on Operations and Supply Chain Management (OSCM) is hosted in Vietnam by RMIT University, Vietnam in collaboration with the Institut Teknologi Sepuluh Nopember (ITS), Indonesia. The previous 8 conferences were held in Bali, Indonesia (2005), Thailand (2007), Malaysia (2009), Maldives (2011), New Delhi, India (2013), Bali, Indonesia (2014), Phuket, Thailand (2016), and Cranfield, UK (2018). "Emerging Technologies in Supply Chain: Opportunities and Challenges" is the theme for this year conference. As we all know, the development of new technologies has major impacts on operations and supply chain management. Technologies such as advanced robotics, drone, driverless trucks, cloud computing, 3D printing, Internet of Things (IoT), Blockchain, and many others have tremendously changing the way the products are manufactured, and the supply chains are managed, and the way we work.

This year we attracted over 180 submissions representing authors from almost 40 countries. Of these, 100 papers have been selected for presentations. This demonstrates a strong international network of the conference that has been maintained since 2005. The reviewers and the scientific committee also noted that many submissions are of high quality. A substantial number of them were recommended for journal publication with revisions. With a wide range of topics and authors coming from many different institutions, this conference will stimulate enriching discussions as well as productive networking environment.

We are also pleased to have two renowned keynote speakers. Professor Shuo-Yan Chou is the Director of the Center for Internet of Things Innovation and a distinguished professor at the Department of Industrial Management, National Taiwan University of Science and Technology (NTUST). Professor Chou will be presenting a topic on Smart Transformation Enabled by Digital Fusion and Industry 4.0, a highly relevance to the conference theme. The second one is Professor Kannan Govindan, who is the Head of the Center for Sustainable Supply Chain Engineering, University of Southern Denmark who will be presenting a topic on supply chain sustainability.

Finally, this conference will not be possible without the contribution of many parties, including the committee, the reviewers, the keynote speakers, the participants, and of course the host institutions and the sponsors. We would like to thank them all for their contribution.

Wishing you all a productive and enjoyable conference.

Conference Chairs,

Assoc. Professor Matthews Nkhoma, RMIT Vietnam
Professor Nyoman Pujawan - ITS, Indonesia
Asst. Professor Reza Akbari, RMIT Vietnam
Assoc. Professor Imam Baihaqi, ITS Indonesia
Professor Caroline Chan, RMIT Australia

About The OSCM Conference

The OSCM Conference was first held in Bali in December 2005, hosted by the Department of Industrial Engineering, Institut Teknologi Sepuluh Nopember (ITS), Indonesia. Subsequent OSCM conferences were successfully held in various locations: Bangkok (2007), Malaysia (2009), Maldives (2011), New Delhi (2013), Bali (2014), Phuket (2016), Cranfield (2018), and now in Ho Chi Minh (2019)

Keynote Speakers

Professor Shuo-Yan Chou

Professor Chou is the Director, Center for Internet of Things Innovation, and distinguished professor Department of Industrial Management, National Taiwan University of Science and Technology (NTUST). He has published over 60 SCI/ SSCI journal papers; PI or Co-PI of more than 80 projects. His research interests are in Internet of Things Innovation, Industrial Internet of Things, Big Data Analytics, Artificial Intelligence, Smart City Applications, Blockchain Application, Intelligent Transportation Systems, Entrepreneurship, Decision Theory, Digital Manufacturing, Computational Geometry.

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Professor Kannan Govindan

Professor Govindan is the Head of the Center for Sustainable Supply Chain Engineering, University of Southern Denmark. He has published over 350 peer-reviewed research articles in journals, conferences and books. His h-index is 66 and total citation 15482 (until 26 March 2019). His research areas, among others, are Sustainable Supply Chain Management, Sustainable Circular Economy, Corporate Social Responsibility, Sustainable Consumption and Production, Extended Producer Responsibility, Industry 4.0 with Sustainable Supply Chain focus.

Operations and Supply Chain Management: An International Journal.

In addition to organizing regular conferences, we also publish an international journal called ***Operations and Supply Chain Management: An International Journal***, as the main outlet of the extended papers presented at OSCM conferences. The journal publishes high quality refereed articles in the field of operations and supply chain management. The journal is indexed in Scopus and Web of Science (Emerging Science Citation Index, by Clarivate Analytics).

We invite original contributions that present modelling, empirical, review, and conceptual works. For more information please visit the journal's website: http://journal.oscm-forum.org/

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- Yahaya Yusuf, University of Central Lancashire, UK
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KEYNOTE ABSTRACTS

INDUSTRY 4.0 AND ITS IMPACT ON SUSTAINABLE SUPPLY CHAIN MANAGEMENT

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ABSTRACT

In today's globalized world, supply chain management becomes increasingly important but also more and more complex. Facets like global competition, outsourcing to countries with lower wage levels, or short product life cycles lead to the shift from inter-company rivalry to competition between supply chains. Additionally, an increasing number of stakeholders in the supply chain demands the consideration of social and environmental issues throughout the conduct of business. Companies have reacted to these concerns with the implementation of annual reports on their environmental impact, sustainability strategies, or through their codes of conduct. However, these efforts seem mostly uncoordinated, and there emerges a massive gap between the advertised sustainability of supply chains and the actual implementation of sustainable practices. New industry 4.0 technologies can have a severe impact on the sustainable management of supply chains because they affect a supply chain's economic, environmental, and social performance. Due to the novelty of these technologies, there exists little research on their impacts on the supply chain's environmental and social performance. This talk will explore a systematic investigation of the implications of the I4.0 technologies on sustainable supply chain management.

SMART TRANSFORMATION ENABLED BY DIGITAL FUSION AND INDUSTRY 4.0

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ABSTRACT

Internet of Things (IoT) is making impact to the society not in an incremental but a disruptive way. With the sensing and connectivity on physical objects and environment, humans can now reach far beyond their physical confinement in space and time to perform much better informed control and management of the physical world. It is transforming the way business was being conducted will also change the way we live and perceive the world. Combining with recently resurrected AI and emerged blockchain, the digital fusion has been quietly driving most of the industries towards the fourth industrial revolution. The three digital technologies complement to one another, enabling a great number of innovative applications and services and allowing the impact goes beyond manufacturing industries. The new World Wide Web (Web 3.0) will have these three technologies contributing significantly to its core strength, alleviating, if not eliminating, current deficiencies of the Web. In this talk, the fundamentals and fusion of IoT, blockchain and AI technologies will be illustrated with applications in Industry 4.0 as well as various smart transformations.

A COMPOSITE COST-TIME TRADE-OFF MODEL FOR MULTI-STOREY PROJECT FAST TRACKING

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ABSTRACT

While enormous research effort in project fast tracking determine efficacy of specific methods and policies that would guarantee strict compliance with project programme, less have been reported on combining existing models for improved performance. In this paper, the task of presenting a composite model for large project cost-time reduction and duration fast tracking is undertaken. The methodological procedures followed in formulating the models were carefully delineated and the proposed models validated using a real life example. The optimal crash time obtained was in total acquiescence with all the problem constraints. The result show that a composite project crashing model is useful in achieving optimal values of important variables.

Keywords: composite model, cost-time trade-off, project crashing, optimal values

A DATA MINING APPROACH TO OPTIMISE LARGE-SCALE OPTIMISATION PROBLEM

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ABSTRACT

The paper proposes a two-stage approach that combines data mining and complex network theory to optimize the locations and service areas of dry ports in a large-scale inland transportation system. In the first stage, candidate locations of dry ports are weighted based on their eigenvector centrality in the complex network of association rules mined from a large amount of international transaction data. In the second phrase, dry port locations and their service areas are optimized using the gravity-based community structure. The method is validated in a real case study optimizing a large-scale dry port network in Mainland China in the context of the Belt and Road Initiatives (BRI). A real-world database of Alibaba transactions between China and other BRI countries is collected for association rule mining to represent international purchasing patterns. The result shows that our proposed model is able to provide realistic and applicable solutions for dry port developments, since it accurately pinpoints key locations in the real BRI development plans.

Keywords: Data mining, Large-scale optimisation, Dry port locations, Transportation

A DETERIORATING INVENTORY MODEL WITH LIMITED VEHICLE CAPACITY, STOCK DEPENDENT DEMAND AND UNAVAILABILITY SUPPLY

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ABSTRACT

Inventory model is one research topic that has been given attention intensively in the supply chain. There are two main costs for inventory, which are transport cost and inventory cost. Therefore, some buyers would like to apply a vendor managed inventory (VMI) system where vendors handle the transportation and manage stocks at the buyer's hand. The problem is complex for some items, such as fruits and vegetables, in which the items deteriorate. The need for fruits and vegetables tends to be higher as the stock is high. Deteriorating inventory models have been developed in many years, however, only a few models considering vehicle capacity, carbon emission, deteriorating items, stock dependent demand, and unavailability supply. In this study, a deteriorating inventory model for multi items in one distribution with stock dependent demand is improved. On the other hand, fruits and vegetable stock are not consistently available, so lost sales costs should be examined. Environmental issues have been studied by many researchers. Therefore, we further consider the carbon emission yield in this model. Since the closed-loop solution can not be obtained, we employ a simple heuristic solution in maple. A sensitivity analysis is employed to obtain some management insight. The sensitivity analysis indicates that the carbon emission tax rate can encourage decision-makers to increase order quantity and reduce carbon emission, but the policy should deal with many features that are recognized by decision-makers to make it useful.

Keywords: inventory, deteriorating, stock dependent demand, carbon emission

A FRAMEWORK FOR ORGANIZATIONAL CHANGE: PURPOSE

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ABSTRACT

The purpose of this paper is to present a systems based framework for organizational change initiatives in order to help organizations plan, prioritize and better implement change initiatives. Our framework is based on a synthesis of existing literature and an Action Research (AR) study. The AR study originated in the idea to develop a performance measurement system to measure all the steps (divided into sub-steps) in change projects from start to finish in a longitudinal study. Over more than two years, we followed and actively contributed to the developments in two separate, major transportation related infrastructure change projects in the same case organization. The results include not only a performance measurement system for change initiatives, concrete practical results for the case organization, but also

"higher level learning" in the form of a systems based framework for understanding organizational change. The framework includes criteria for change management success, with a specific focus on the need for a clear and jointly accepted purpose. Furthermore, these criteria cannot be studied in isolation and thus a systems based approach is required.

Keywords: organizational change, process management, measurement system, systems theory

A MULTI-OBJECTIVE TRANSPORTATION PROBLEM UNDER QUANTITY DEPENDENT COST STRUCTURE AND CREDIT PERIOD POLICY IN TRIANGULAR-INTUITIONISTIC FUZZY ENVIRONMENT

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ABSTRACT

In this study, we have constructed a multi-objective transportation model under quantity dependent cost structure and quantity dependent breaking down credit period policy to maximize the total profit of the distributors and to minimize the total cost of the retailers. Here, a basic credit period is offered by the distributors to the retailers according to the predefined interval of the transported amount and the actual credit period is fixed depending on the extra quantity from the lower limit of the interval of the transported amount. In a crisp environment, two different types of models have been formulated depending on different types of quantity dependent cost structure under the same credit period policy. Due to the uncertainty of the nature of the actual transportation cost, a fuzzy model has been formulated by taking the actual transportation cost as a triangular-intuitionistic fuzzy number. Here, the triangular-intuitionistic fuzzy data has been converted into crisp form by using weighted possibility mean method and Ordered Weighted Average (OWA) operator. After defuzzification, all the models have been solved by Elitist Non-dominated Sorting Genetic Algorithm (NSGA-II) to obtain a set of non-dominated solutions. Each model has been illustrated numerically with a suitable example. Finally, some sensitivity analysis and managerial insights of the models have been briefly discussed.

Keywords: Multi-objective transportation problem, Quantity dependent cost structure, Quantity dependent credit period, Triangular-intuitionistic fuzzy number

A STUDY ON LOGISTICS RISK ASSESSMENT: THE CASE OF CONTAINER SHIPPING IN EGYPT

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ABSTRACT

Risk management gained more attention in the Egyptian market after the political events in January 2011. More businesses now consider risk management a priority, especially that the Egyptian market over the years experienced several political, economic and environmental shocks that negatively affected its operations. Logistics being part of the supply chain, is a critical link that is vulnerable to any unexpected changes that could result in loss of money and goods. Therefore, this research examines the risks associated with logistics services provided for container shipping in the Egyptian market. The research addresses the risk factors linked to the provision of logistics services from both the providers'

and the customers' perspectives. This is a case study in which interviews and surveys were deployed to identify risk factors, examine its consequences, rank them using risk mapping and examine the correlation. The study classified the risk factors into categories and examined the perspectives of both providers and customers. The results showed strong positive relationship between risk likelihood and risk consequences for both the logistics service companies and the customer companies.

Keywords: Risk, Risk Assessment, Logistics Services, Egypt, Mediterranean, Container Shipping.

ACCOUNTING FOR SUSTAINABILITY IN SUPPLY CHAIN VISIBILITY ASSESSMENT

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ABSTRACT

Supply chains strive to improve their visibility levels. For a supply chain, visibility is ability to see clearly from one end of the supply chain to another whilst sharing information across the chain. Visibility performance is achieved principally through improved integration of quality information, coordination of supply chain relationships, bullwhip effect reduction, and enhancement of technological and management capabilities. These factors are important in supply chain visibility assessments. With the increasing need for supply chains to be sustainable, it is imperative that sustainability associated factors are accounted for in supply chain visibility assessments. Accounting for sustainability in the assessment requires integration of factors associated with compliance of gr een practices embracing environmental, social and economic considerations across products and services life cycle. This paper examines ways of consolidating assessments of supply chain visibility by accounting for sustainability. Following a review of related work, an analysis of sustainability measures in supply chain visibility assessment methods is presented. An integration of a notion of green absorption capacity in supply chain visibility assessments is then suggested and the associated benefits is discussed.

Keywords: visibility, assessment, sustainability, Supply chains

AN APPROACH TO DEPLOYMENT READINESS REVIEW IN MANUFACTURING

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ABSTRACT

A key consideration in innovation deployment processes in manufacturing is ensuring that the intended deployment will run smoothly and relatively problem free. This consideration can be in the form of deployment readiness assessment and review. This paper presents an approach to deployment readiness review in manufacturing with a focus on process innovation implementation. In the context of this paper, deployment readiness review is an appraisal conducted to determine if an acceptable state of preparedness has been attained for implementation of a manufacturing process innovation into a target environment. It is a form of quality control and the outcome will often be a go/no go decision with recommendations. Following a review of literature, an approach to deployment readiness review that encompasses three main phases is suggested: a) initiation of the review process, b) deployment readiness deliberation and assessment, and c) feedback and follow-up. Central to the initiation of the deployment review phase is ensuring that the pre-requisites for the review are met, including a deployment readiness review plan, selection of the review panel, and complete deployment process documents. The deployment readiness assessment can consist of both qualitative and quantitative assessment protocols from which feedback and follow-up actions are developed. An example of manufacturing process innovation deployment readiness review in a job shop is provided to illustrate the approach.

Keywords: Deployment Review, Process Innovation, Job Shop, Readiness Assessment

AN EMPLOYMENT-FOCUSED CURRICULUM FRAMEWORK TO CLOSE SKILLS GAPS AMONG SUPPLY CHAIN PROFESSIONALS

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ABSTRACT

In recent decades, the higher education sector has been heavily criticised for its inability to provide a high-skilled, work-ready labour force to meet industry needs. Many companies provide training for new employees and estimate that it takes these workers between 3 months and 2 years to learn the necessary skills to do their job. This training is costly for employers, especially as these workers often leave the company for a new position once they have acquired skills that make them more employable. This paper describes the development of an employment-focused curriculum that will enable business and education leaders to leverage their combined knowledge of labour markets, skills, and pedagogy to produce job-ready graduates and to close current skills gaps among higher education graduates.

Incorporating input and feedback from employers into curriculum development helps to ensure that learners develop the work readiness and technical, specialist, and foundational (thinking, analytical, and

digital) skills that employers seek. By developing a clearer understanding of what employees need to be able to do, educational institutions can refine their curricula and link training to the reality learners face on entering the labour market. This three-stage study investigates industry needs and employee skills. Based on a review of the literature on skills and training, the second stage involved the construction of instruments used in focus groups with industry participants in Jakarta and Surabaya. In the third stage, respondents completed a survey based on closed questions. The findings suggest that employees lack a range of skills, principally soft (thinking and learning, interpersonal, customer service, and business) skills. On that basis, a new approach is proposed for developing programme curricula that focus on these soft skills.

Keywords: skills, supply chain, Indonesia, training, education, soft skills

AN INVESTIGATION OF RELATIONSHIP AMONG STORE ATTRIBUTES, CUSTOMER SATISFACTION, REPURCHASE INTENTION AND ADVOCACY: CASE OF JEWELLERY STORES IN INDIA

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ABSTRACT

The purpose of this study is to identify the key store attributes of retail stores, which impact customer satisfaction and leads to customer advocacy and repurchase behavior. In particular, jewellery stores are selected for this research investigation. The study analyzes the relationship between the store attributes, customer satisfaction, advocacy, and repurchase intention to provide insights to retail store managers about the key store attributes. The conceptual model is developed with the help of literature and experts opinion. The data is collected from the customers of jewellery stores of gwalior city and 131 responses were collected. The results reveal that the product related attributes, service quality related attributes and store related attributes of jewellery store have positive influence over the customer satisfaction. Also the customer satisfaction leads to advocacy and repurchase intention. The study suggests that jewellery store managers should focus on the identify and manage the store attributes identified in this study to improve customer satisfaction, advocacy and repurchase intentions. Evidences from this study also suggest that are customer satisfaction will also result in positive word of mouth (WOM) and repatronize the store for future purchases.

Keywords: Retail, Store Attributes, Customer Satisfaction, Advocacy, Jewellery Stores

ANALYSIS OF MANUFACTURING DATA USING QUALITY ANALYSIS PLATFORM

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ABSTRACT

We have developed analytical tools that include various modules based on statistics and machine learning for quality analysis through many national project. Typically, there are two analysis tools, one is Q-Factory and the other is IIoS Platform. The Q Factory platform contains a total of 39 analysis modules, each of which is divided into four categories: basic quality improvement tools, statistical analysis tools, statistical process control, and data mining-based quality management tools. The IIoS platform includes about 15 analysis modules and is developed with clustering, classification and prediction algorithms. In this study, we introduce the characteristics and detailed modules of two quality analysis platforms and present cases of quality analysis using manufacturing data.

Keywords: Q-Factory, IIoS Platform, Statistics, Machine learning, Quality management

APPLYING A SUSTAINABLE INDUSTRY 4.0 IN SOUTHEAST ASIAN AGRI-FOOD INDUSTRY, A LITERATURE STUDY TO THEIR CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Southeast Asian countries, sometimes also known as the collective ASEAN, have always known as fertile lands that provided food and plant-based commodities throughout history. In the 21st century, their production capacity has always been limited to the management of their field and the way they operate, which is still dominated by mostly traditional farming methods. Furthermore, they are also affected by climate changes and natural disasters that frequented the area and increasing population growth and mass urbanisation, which led to reduced growth in food sustainability and security. With the three major countries in ASEAN, Thailand, Indonesia and Vietnam, being part of the international agri-food communities, they are aiming to provide more tools, machinery and fertilizers to their most rural producers to increase their capacity. However, their efforts are also hampered by the limited funding to increase infrastructures to their poorest regions. This research will then focus on how the governments could apply insights learned in the development of sustainable practices, both for production and transportation, and industry 4.0, tools and advancements could be used to support development in the region. Furthermore, sample case studies could also be used to illustrate the necessary framework for the development of agricultural zones.

Keywords: southeast asia, agri-food industry, sustainable development, industry 4.0

APPLYING FUZZY ANALYTICAL HIERARCHY PROCESS TO RESHORING DECISIONS WITH COMPLEXITY AND UNCERTAINTY

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ABSTRACT

Reshoring decisions are associated with both high complexity and uncertainty. The increased complexity is due to the vast number of factors that need to be considered, while the uncertainty is due to the lack of sufficient information. The existing decision-making frameworks are few and theoretical and have not incorporated uncertainty and complexity aspects. Moreover, they do not provide automatic or digital decision support. In order to deal with this, one of the essential branches of mathematics called fuzzy logic is integrated together with traditional analytical hierarchy process (AHP). The aim of this study is to investigate the feasibility of fuzzy analytical hierarchy process (FAHP) as a tool for reshoring decision making when complexity and uncertainty are involved. In order to achieve this, the FAHP was applied to six reshoring criteria, which also correspond to competitive priorities. The findings show that the criterion quality received the highest weight, followed by the criterion cost. It was found that the criterion sustainability resulted in zero priority weight, which means that this criterion was not given importance in this decision. This reduced the complexity of the decision by removing irrelevant criteria in decision making. The fuzzy sets used for pairwise comparisons also incorporated uncertainty in the decision. The FAHP is a feasible tool for reshoring decision making for most of the decision scenarios. This reshoring decision-making tool is automatic, simple and less time consuming, and can be adapted to suit unique reshoring cases.

Keywords: reshoring decision making, fAHP, uncertainty in decision, decision support tool, manufacturing location.

ASPECTS OF DIGITALIZING THE SUPPLY CHAIN SOURCING PROCESS: A CASE STUDY FROM THE NORWEGIAN INDUSTRY

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ABSTRACT

While there is a strong interest to move towards a fully digitalized and integrated business to business (B2B) process, many companies oversee the importance of different aspects that should work together for a successful implemented B2B process. These aspects include alignment of the cross-organizational business process, organizational responsibility assessments, and technological readiness evaluation to reach at a sound digital B2B strategy. Without such a strategy, the business case for digitalizing B2B is not necessarily positive due to for example mismatch between strategy, process and technology, unclear responsibilities, and missing links in the technological infrastructure. Consequently, the investment on

digitalization of a B2B process may not result in expected outcomes with over-budget implementations. This paper presents a framework for facilitating digital B2B integration, outlining and elaborating the aspects that should be considered in the digitalization of a supply chain process and information exchange. A case study from the maritime sector is discussed to map an ongoing project for the digitalization of a supply chain sourcing process, in the light of identified aspects. The case study explores the relationship between two suppliers and one manufacturer. They currently rely on an e-mail driven communication for the sourcing of products and have an ongoing incentive to further digitalize their relationship trough an EDI system. The paper contributes to theory and practice by proposing a holistic framework for digitalization of the supply chain sourcing process and providing insights and learnings from a real-life manufacturing company in this context.

Keywords: Supply Chain Management, B2B, Digitalization, Edi, Sourcing, Purchasing

ASSESSING SUPPLY CHAIN MATURITY FOR RETAIL PHARMACY CHAIN

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ABSTRACT

Retail pharmacy chains have significant impact on Egypt's economy and play a vital role in medicines availability in the local market. Therefore, this research aims to assess the supply chain maturity of one of the top retail pharmacy chains in Egypt using the supply chain maturity assessment test (SCMAT). SCMAT helps in assessing the different performance areas in a company's supply chain to initiate improvement and sustain business competitiveness. This is a qualitative case study that presents in-depth analysis of supply chain activities assessment. A focus group was organized with eleven top and middle managers from the retail pharmacy chain belonging to the following functions: supply chain, logistics, quality management, operations, information technology, customer service, procurement and human resources. In this focus group, participants assessed the level of supply chain maturity of their company. The analysis showed that there are several areas of improvements within the retail pharmacy supply chain which can support the chain in expanding its operations to more cities in Egypt.

Keywords: Retail pharmacy chains, Supply Chain Management, Performance Management, Maturity Test, Egypt.

AUTOMATIC GENERATION OF FUZZY INFERENCE RULES IN A RESHORING DECISION CONTEXT

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ABSTRACT

This paper presents a decision-support system for reshoring decision-making based on fuzzy logic. The construction and functionality of the decision-support system is briefly outlined and evaluated in a high-cost environment contemplating six specific decision criteria, namely cost, quality, time, flexibility, innovation and sustainability. A major challenge with fuzzy logic solutions has to do with the construction of the fuzzy inference rules. In the relocation domain, the fuzzy inference rules represent the knowledge and competence of relocation experts and they are usually created manually by the same experts. One obstacle is that the complexity of the fuzzy inference rules increases with the number of

decision criteria. To overcome this complexity issue, this paper presents a solution whereby the fuzzy inference rules are automatically generated by applying one hundred reshoring scenarios as input data. The reshoring decision recommendations produced by the fuzzy logic decision-support system are demonstrated to be close to those of human reshoring domain experts.

Keywords: decision-support system, fuzzy inference rule generation, fuzzy logic inference system, membership function generation, reshoring.

BIO-PLASTIC PACKAGING AND PRODUCT CO-INNOVATION: CRITICAL ISSUES IN B2B COLLABORATION

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ABSTRACT

This paper aims to uncover critical issues in co-innovation of bio-plastic packaging in the context of the Business to Business (B2B) dyadic collaboration. To a large extent, the issues are influenced by the mismatch between the characteristics of bio-plastic packaging and the products/applications they are intended for. The research described in this paper employed a desk-based research approach, taking the benefits of the existing knowledge base in the combined areas of sustainable product innovation, sustainable product development and strategic management. The findings of the research have led to the development of comprehensive indicators of bio-plastic packaging product innovation and a conceptual framework describing the bio-plastic co-innovation mechanism. The framework extends the existing concept of co-innovation through joint activities and commitment on resources over innovation and the innovation performance, by adding clear mechanisms of joint activities, joint resources and relationship management, that ultimately act as the key success factors of the co-innovation process in bio-plastic packaging.

Keywords: Bio-plastics, packaging, co-innovation, product development, dyadic collaboration

BIVARIATE CONTROL CHART FOR QUALITY CONTROL ANALYSIS IN BREAD PRODUCTION PROCESS, INDONESIA

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ABSTRACT

Quality of bread production is of importance to be analyzed as it is a widely consumed food product in Indonesia, substituting rice. As bread production is located in the red ocean market, it is crucial for the companies to maintain the quality of the bread in order to preserve their customers. The statistical control chart is one of the tools to be used in overseeing product quality. A simple statistical control chart is based on the assumption that the field data are normally distributed. Nonetheless, in real case scenario, non-normal distribution of data is often found. Hence, this paper aims to construct bivariate control chart with copula as an alternative tool which regards the non-normal distribution of data and

its effect on the firm-level quality management process. The numerical analysis is applied in this study to see whether or not bivariate control chart with copula is indeed better than the existing control chart. This paper makes use of simple random sampling methodology to evaluate one of the biggest bread companies in Indonesia, company ABC. By illustrating detail analysis using bivariate control chart with copula, the result shows that the alternative control chart is valuable in monitoring the quality of bread production in Indonesia.

Keywords: control chart, copula, bread production, quality control

BLOCKCHAIN FOR IMPROVEMENT OF EMERGENCY RESPONSE IN HUMANITARIAN LOGISTICS INDONESIA

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ABSTRACT

Seven days of emergency response is one of the critical and most dynamics phases of disaster relief for this phase determines the survival rate of disaster victims which rely on coordination amongst all supply chain members. Current technology development, especially blockchain, had enabled supply chain to update and coordinate in real-time while maintaining its accuracy data. Blockchain is expected to improve supply chain performance. However, the application of blockchain is very limited in humanitarian logistics. This conceptual article aims to propose blockchain implementation on the humanitarian logistics performances to increase the efficiency of replenishment operations during disaster emergency relief, especially in Indonesia.

Keywords: humanitarian logistics, replenishment, blockchain

BUSINESS AND SUPPLY CHAIN STRATEGY OF FLYING ABOVE THE DESSERT: A CASE STUDY OF EMIRATES AIRLINES

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ABSTRACT:

Emirates airlines has been a dominant player in the middle-east aviation industry earning enormous profits over a decade. However, the profit margin for the year 2017 has plunged lowest in the last 5 years of its service. This research investigates the rationale behind business and supply chain strategy of the organization by applying different tools during this challenging times and proposes recovery strategy from the recent financial scuffle. A case study methodology is adopted to investigate the business and the supply chain strategy of emirates airlines, with the research highlighting the distinctive capabilities of emirates airlines along with the supply chain risks that prevails the organizations in the aviation industry. The findings of the research imparts the intelligence on the business and supply chain managers to optimize the internal resources & capabilities of the organization that can be imperative in creating distinctive competitive advantage and higher profit margins. Moreover, this research of

investigating emirates growth strategy internationally seems to bring value to other similar airline industry and will be of great value from managerial level to d-level executives for strategic planning process. The case study is limited to emirates airlines. However, the procurement risks associated with the purchase of fuel in the aviation industry can be investigated further.

Keywords: airlines industry, competitive strategy, business strategy, supply chain strategy

CARRIAGE CHOICE SIMULATION MODEL IN RAILWAY TRANSPORTATION FOR CEMENT DISTRIBUTION SYSTEMS

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ABSTRACT

For the distribution of finished product of cement, many companies usually combine the use of truck and railroad modes for more efficient costs. There are several practices commonly used by companies on determining the type of railroad carriage with different operating model that could affect the effectiveness of the cement distribution. This study will compare two different shipments of using flat carriage and container carriage by considering the efficiency of loading and unloading time and the optimal utilization of the railroad carriage capacity. For the operation model of using container railroad carriage, this study also analyzes more specifically by comparing both types of containerization that commonly used by companies: the open-side container and the general-purpose container. Analysis of the operating model uses simulation method by considering certain constraints such as the railroad carriage capacity, the cross capacity, the station capacity, and the time windows of loading and unloading stations. The purpose of this study is to determine the type of the railroad carriage needed by the company for cement distribution to obtain optimal number of carriages with minimum loading and unloading time. Analysis is carried out to determine a better operating model between using flat carriage and container railroad carriage that create cost-effective values for the companies.

Keywords: railway, cement, distribution, carriage, logistics, simulation

CASHEW NUTS IN VIETNAM: FROM THE FARM TO THE INTERNATIONAL MARKETPLACE

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ABSTRACT

Vietnam ranks second behind India for cashew nut production and the world's largest processor and exporter, with nearly 25% of the world total of exports in a trade worth an estimated us$3.7 billion in 2018. Global demand for cashew nut is increasing and the nuts are found in an increasing range of value-added products. However, the industry in Vietnam suffers from numerous supply chain problems and low productivity among the many small producers of the product. The country has to import nuts to make the operations of processers profitable and many enterprises end up selling the nuts at low costs just to continue needed cash flow. This paper examines the structure, conduct and performance of the cashew nut industry in Vietnam with a view to understanding the problems that present the full realisation of the potential value of the sector and the ways in which Vietnamese companies have sought to internationalise themselves in the world marketplace. The role of international partners and of

national institutions are analysed to identify their impact on competitiveness and this leads to a series of recommendations for various actors in the market.

Keywords: cashew nuts, internationalisation, supply chain, Vietnam

CIRCULAR ECONOMY ADOPTION IN THE AQUAFEED INDUSTRY

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ABSTRACT

This paper aims to explore the extent to which the Circular Economy (CE) concept has been implemented in the aquafeed industry. The issues surrounding this industry are pertinent to the resource inefficiency concerns, involving waste generation from aquatic species; resource scarcity including water, energy and overfishing; and pollution as a result of aquafeed production. In this paper, a desk-based approach was employed as the research method, taking the advantages of the breadth and depth of existing contributions in the body of literature, covering the areas of CE, aquaculture, sustainability assessment and circularity indicators. Due to the growth in the aquaculture sector, the demand for raw materials increases rapidly, creating a high dependency on resources derived from the marine catchment. Our research found that 1) CE has so far merely been translated into a practical implementation by means of the conversion of food waste and by-products to replace fish meal; 2) the circularity assessment methods in aquafeed industry are lacking; and 3) indicators to measure CE in the aquafeed industry is not apparent in the literature. A conceptual framework has been synthesised to incorporate the theoretical lenses of Natural Resource-Based View (NRBV) and Dynamic Capabilities (DC). The framework describes the relationships that exist amongst the NRBV, DC and the principles of CE relevant to the context of the aquafeed industry.

Keywords: Circular Economy, circularity, aquaculture, aquafeed industry

CLOUD COMPUTING AND IOT APPLICATION: CURRENT STATUSES AND PROSPECT FOR INDUSTRIAL DEVELOPMENT

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ABSTRACT

The dawn of the fourth industrial revolution motivates the unveiling of new business models and technological selections, to enable enterprises to operate efficiently. The vision of digitization and intelligent or smart technique to organize future industrial operations is a compelling issue to address. Deployment of the internet of things (IOT) concepts relies on the robustness of innovative functionalities available to drive industrial processes. I.e., improvement in industrial operational performance is not far-fetched from the urgency to gain an understanding of IOT architecture and protocols for applicability. The present study is an exploratory research into the most recent cloud computing services and IOT technologies to proffer knowledge on their potentials and analyze their applications from an industrial perspective to promote sustainable operations. This article covers the general requirement for the success of a digitization trend in the industrial sector and considers state-

of-the-art technological intervention towards cloud computing advancement to promote IOT services. Industrial systems enabled with IOT should improve operations and transform businesses in the future. Industries today should convert IOT data into valuable information to aid the increase of sustainable and conservative practices, this would enable the provision of better solutions leading to organizational effectiveness. This present study is a contribution to the body of literature on the subject matter.

Keywords: cloud computing, internet of things, manufacturing SMEs, techno-innovation

CO-PRODUCTION OF VALUE BETWEEN FUNCTIONS FOR SUPPLY CHAIN PERFORMANCE

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ABSTRACT

Value co-creation is the concept extensively explored and studied in the marketing literature has attracted the attention of researchers and practitioners to improve the participation of customer during interaction with firm to create superior value in use. This interaction exists between other interacting parties as well for instance between suppliers, manufacturers, distributors and functions such as logistics, operations, sales, marketing, and procurement. This study has identified the co-production as a significant contributor of value co-creation during functional interaction to improve supply chain performance. This study also investigated the direct impact of three dimensions of higher order construct of co-production; knowledge sharing, equity, and interaction independently on supply chain performance. The moderating role of external integration between inter-functional co-production and supply chain performance is also investigated. The data was collected from managers who are performing supply chain management roles. 112 valid responses are analyzed using PLS-SEM. The results show that knowledge sharing and co-production has positive impact on supply chain performance while equity and interaction do not have significant impact. However, the combined effect of these three lower order constructs forming co-production has a positive impact on supply chain performance. The results of this study provide clear insight for the managers and practitioners to improve supply chain performance by encouraging co-production activities.

Keywords: value co-production, supply chain performance, external integration, knowledge sharing, functional interaction, equity, value co-creation

COMPLEXITY IN HANDLING ORDERS OF SPARE PARTS

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ABSTRACT

Spare parts supply, often associated with rush orders, is studied through a single case study of an advanced sanitary product supplier. This supply process is emergent. Difficulties of determining and dealing with root causes, unexpected effects, and interventive solutions for rush orders are discussed. This provides conceptual foundation for considering complex systems thinking to handle rush orders.

Keywords: rush orders, spare parts supply, networking, customer services, complex systems.

CONNECTING SUPPLY CHAIN MANAGEMENT STRATEGIES, AGILITY AND PERFORMANCE IN SOUTH AFRICAN SMES

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ABSTRACT

The failure rate of most SMEs in South Africa has remained very high, with up to 70 percent of such businesses closing down within the first five years of operations. High business operating costs incurred by SMEs are often cited as one of the major causes of these failures. It may be argued that to reduce these costs, and hence improve the success rates of SME ventures, supply chain management (SCM) strategies should be adopted and implemented. This article provides an analysis of the connection between SCM strategies, supply chain agility and supply chain performance amongst SMEs in South Africa. A total of 407 owners, managers and professional employees of SMEs operating in Gauteng province were recruited randomly to participate in the study. To test the hypothesised relationships, the collected data were analysed using Pearson correlations and regression analysis. The number of people employed was used as the control variable that moderates the hypothesised relationships. The results of the study disclosed that all four SCM strategies (supplier collaboration, TQM, technology adoption, supply chain integration) correlated with and predicted supply chain agility. Technology adoption (β=0.54) emerged as the strongest predictor of supply chain agility. In turn, supply chain agility correlated with and predicted supply chain performance. The article concludes by recommending specific interventions that may be employed by SMEs to ensure that that the adoption of SCM strategies yields positive outcomes.

Keywords: Supply chain management strategies, Supply chain agility' Supply chain performance, SME, Supplier collaboration, Total quality management, Technology adoption, Supply chain integration

CUSTOMER INFORMATION USAGE: IMPROVING SUPPLY CHAIN PERFORMANCE AND ADVANCING LOGISTICS SERVICES IN CONSTRUCTION PROJECTS

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ABSTRACT

This study investigates how continuous improvement of logistics services in a project based context such as construction can be enhanced by a "priority matrix for service improvements". Construction services in general, and logistic services in specific, have great impact on efficiency and sustainability (environmental as well as social). Solutions and experience from e.g. manufacturing and retailing that

have undergone major transformation through industrialization and, more recently, servitization, to improve the quality and novelty of their offerings, there is a great potential in addressing the complex coordination, inefficient processes, and waste of materials in the project-based context of the construction industry. Whilst improvement initiatives concerning product quality are important inspiration of such transformation, they are based on continuous production processes and become a challenge when this experience is transferred to the project-based, construction industry. As response, this study draws upon the concept of service quality as the basis for improvement initiatives – a concept based on relations between actors that last beyond individual projects.

Keywords: customer information usage; construction projects; logistics services

CUSTOMER SATISFACTION AND REVERSE LOGISTICS IN E-COMMERCE: THE CASE OF KLANG VALLEY

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ABSTRACT

The e-commerce sector has been significant growth in Malaysia. Customer satisfaction has become an essential issue in the success of e-commerce customer experience. Customer satisfaction is essential for online retailers by providing a metric that they can use to manage and improve their online businesses. In Malaysia, online shoppers are facing difficulties in returning products, though they are facing with a faulty product. Hence, reverse logistics plays a vital role in e-commerce for increasing online shoppers' buying confidence and customer satisfaction. However, there is limited studies focus on the impact of reverse logistics on customer satisfaction in e-commerce. Thus, this paper aims to determine the relationship between the variables of situational factors (advertising and accessibility) and customer satisfaction towards reverse logistics in e-commerce in the surrounding area of Klang Valley. The data are collected through the online survey and paper survey with 400 respondents who had an online shopping experience. The data are analysed using pearson correlation analysis and multiple regression analysis. The result of this study is expected to provide positive contributions to online retailers in understanding customer needs and wants, thereby creating a good return policy that committed to customers satisfaction and sustainable online shopping experience.

Keywords: customer satisfaction, reverse logistics, e-commerce

DESIGN RECOMMENDATIONS FOR THE FEASIBILITY OF AUTOMOTIVE PARTS REMANUFACTURING: A CASE STUDY IN INDONESIA

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ABSTRACT

The number of cars in Indonesia increases significantly in recent years and the production of new cars has caused substantial environmental impacts. Remanufacturing is considered to be a way to alleviate the impacts, as it cuts the amount of waste being landfilled, conserves energy and reduces virgin materials consumption. Automotive parts remanufacturing transforms used and worn car parts and components into functional parts that, at least, match the performance of the newly manufactured parts. Remanufacturing is a complex process involving the full cycle of production, from design to manufacture, thus requires a careful determination of the design features that support remanufacturing processes. This study aims to identify what design features automotive parts should possess so that the parts can be remanufactured. We analyzed the remanufacturing process of six frequently replaced automotive parts, i.e. shock absorber, clutch disc, alternator, brake pad, tie rod, and compressor, and came up with the design characteristics that make the remanufacturing process feasible. This paper offers design recommendations linked to the existing literature. The findings of our study have been validated by a number of automotive practitioners.

Keywords: remanufacturing, automotive parts, design recommendation, Indonesia

DESIGNING INTEGRATED RISK CATALOG FOR ENTERPRISE RISK MANAGEMENT OFFICE OF CEMENT INDUSTRY (A CASE STUDY)

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ABSTRACT

As the biggest cement manufacturer company in Indonesia, Company-A utilizes all potential resources and competencies across operational, production, marketing and strategic level. Every function has a set of strategy based on balanced score card (BSC) framework, covers micro to macro level tasks, to achieve optimum performance. However, the company finds some unpredictable risks that can affect

the business process. It drives to the need of appropriate risk management function, and Enterprise Risk Management Office (ERMO) was well established by then. ERMO has to define the potential situations, and analyse it using a wider perspective. They should design a comprehensive framework and policies, develop a risk register list, analyse the corporate risk and find the best way to deal with it. The implementation of risk management in this company is also properly monitored then being evaluated to find the right improvement strategy for the following works. At the initial study, it is known that company A has determined the big picture strategy and set the policies, but they do not have a proper risk mapping. Thus, this study aims to provide a risk map according to ISO 31000 and consider department's key performance indicator and some future challenges. An appropriate risk catalog is proposed to help ERMO of other cement industry in managing risks and decide the right mitigation actions by then.

Keywords: Balanced Score Card, Cement Industry, ERMO, ISO 31000, Risk Mapping, Risk Catalog

DETERMINATION OF SUPPLY CHAIN LOCATION SEAWEED INDUSTRY WITH DYNAMIC PROGRAMMING

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ABSTRACT

Activities to proceed natural results into a product, start by determining the potential location, to manage raw materials, processes, until the product is ready to consume. Location determination is strongly influenced by characteristics owned by an area, especially with regard to raw materials derived from agriculture. Location determination is usually influenced by similarities, characteristics that are owned by several places that are in the same area, so that it is important to determine the role of a location, to cultivate natural results. The research will be observed on location determination, for seaweed commodities which consist of the region, seaweed farming, industrial base, industrial processing, and distribution. The analytic hierarchy process (AHP) is used to determine the weight priority location to proceed seaweed, *which focus on aspect natural resources, infrastructure, labour, technology, policy, education, and economy.* The weight of each subsequent location is used, to determine supply chain with the largest sum of weights. Determination of the largest sum of weights, by utilizing the dynamic programming, as well as determining of an effective supply chain for seaweed industry on a region. The results with a dynamic programming model, show supply chain performed by changing weight result from AHP to proceed, effectively by minimum function of stagecoach dynamic programming model, and final result normalized to find maksimum sum of weight that show the best location with potential processing industry for seaweed in each area.

Keywords: location, supply chain, industry, seaweed, dynamic programming

DETERMINING THE IMPORTANT FACTORS OF PORT DIGITALIZATION: THE EMPIRICAL CASES OF INDONESIAN PORTS

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ABSTRACT

Knowledge economy has been recently influencing various trading activities including the supply chain process and particularly on port operations. Ordering of port services, monitoring, controlling cargo handling and payment processes at a port including its continuous process at inland terminal are imperatively required by the port-users. Government via port authority also support this notion by driving policy that favors to the implementation of this digitalization service platform particularly on monitoring and maintaining acceptable port performances and its better impact to operational and commercial in a large scale for port community system. This paper explores the operation and commercial impact of port digitalization using Indonesia cases that have been recently implementing the port digitalization at Tanjung Priok Port-Jakarta, Teluk Lamong multi-purpose Terminal in East-Java and Cigading Port in Banten West-Java and also surrounding port-ecosystem. The qualitative and comparative approaches are applied in collecting responses from port-users as well as in comparing the benefits and impacts of pre and after port digitalization that have been implemented. As the results, the study finds that the digitalization does provide better service performances in terms time and costs, including better performances, visibility of process and transparency of payments. Thus, the digitalization has a positive as well as negative effects not only due to the lower operational costs but also higher commercial effects both for port operators and users. However, internal platform of entities of port operators, shipping operators, forwarding agency and cargo owners should have a similar or standardized Information Communication Technology (ICT) platform in avoiding problem when interfacing data interactions

Keywords: Important factors, port digitalization, Indonesian ports

DEVELOPING BUSINESS MODEL OF PHYSICAL THERAPY TRICYCLE BY INTEGRATING LEAN CANVAS AND VALUE ENGINEERING

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ABSTRACT

Stroke is one of leading cause of short and long-term disabilities. Rehabilitation is an important part of post stroke patient care. Patients with motor impairments should be encouraged to do a routine exercise to improve their quality of living and increase their independence. Cycling is one example of suggested

exercise that offers motor function recovery. This study is a partial part of a research that aims to commercially produce a physical theraphy tricycle for post stroke patient. Previous research has defined that the design of this tricycle is suitable for post stroke patient that could be seated unaided and it could be also utilized as a mode of transportation. Currently, this physical therapy tricycle development has completed its Beta prototyping stage. While, this tricycle design is still undergoing futher testing, a business model for a future company that will manufacture this tricycle is proposed by this study. Lean canvas is utilized to develop the business model. It is integrated with value engineering approach to specifically generate value proposition by using Function Analysis System Technique diagram. As a result, this study is not only to propose business model but also to provide recommendation for Beta design of physical theraphy tricycle. Addition of hand holder and pedal strap are suggested to improve the design of this tricycle.

Keywords: Physical therapy tricycle, Post stroke patient, Lean Canvas, Value Engineering, FAST diagram

DEVELOPING NETWORK PROJECT SCHEDULING FOR ASSEMBLY OPERATIONS IN THE AIRCRAFT MANUFACTURING COMPANY USING ACTIVITY ON NODE (AON)

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ABSTRACT

CN-1 is a multifunctional military aircraft manufactured by Company A, a state-owned company that has been established for more than 30 years. This manufacturing process is involving hundreds of assembly operation, which is divided into four series stations with more than 300 tasks. A high workload causes several problems, especially in the station 1. It experienced frequent delays in completing project targets and human resource allocation, that eventually affect the total project costs. Based on the analysis, the problems occur due to the inappropriate project scheduling. In addition, some project's parameters as the minimum evaluation requirement needed, had not been explained by the existing method. The main objective of this study is to propose an improvement in the company project scheduling using Activity on Node (AON) framework with circle nodes. The project codes and durations are properly mentioned by then. This adjusted tool is considering four parameters such as early start (ES), latest start (LS), early finish (EF), and latest finish (LF) in every single node. The critical path of CN-1 production has been determined at the following step, which takes 488 hours or about 70 working days. This study finds the optimum scheduling that expected to increase project time effectiveness and cost-efficiency. It could be a significant improvement to be implemented in a similar condition.

Keywords: Aircraft Manufacturing, Activity on Node, Assembly Operations, Project Management, Scheduling

DEVELOPING PERFORMANCE MEASUREMENT SYSTEM IN FOOD INDUSTRY: A LITERATURE REVIEW

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ABSTRACT

Every company needs to understand its performance in order to develop good strategies. To know its performance, an appropriate performance measurement system (PMS) should be proposed. Performance measurement system is a brief and exact set of measures (financial and non-financial) that support the decision-making process of a firm by gathering, processing and analyzing qualified data of performance information. The aim of this study is to develop suitable and potential framework of performance measurement system in food industry using literature review analysis. The measures are then classified into groups. Interestingly, they are fit into the four perspectives of the balanced scorecard (BSC), except a few measures, which cannot be put into these four perspectives. These measures are unique for the food industry and are classified into a new perspective called "food quality perspective." Hence, the proposed performance measurement system for the food industry contains customer perspective, financial perspective, internal process perspective, learning and growth perspective, and food quality perspective.

Keywords: Performance Measurement System (PMS), Balanced Scorecard (BSC), Food Industry, food quality perspective

DIGITAL MUDA -THE NEW FORM OF WASTE BY INDUSTRY 4.0.

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ABSTRACT

Lean management is an approach where value is created through the reduction of waste. Eight forms of waste were identified by the Toyota company to be considered while managing an efficient production process: overproduction, waiting, transport, over processing, inventory, movement, defects, unused creativity. Modern manufacturing plants are being transformed by industry 4.0, the fourth industrial revolution, which promotes a wide variety of technological solutions to increase innovativeness and competitive advantages. Since the start of industry 4.0, machines and tools have become smart, collecting data about the processes and products produced at the plants, as well as products themselves becoming smart and generating their own data. Collecting and analyzing the data is very important to enable manufacturers to be more strategic in the decision-making process and generate new profit channels through data analytics. Data analysts, robot and plc programmers, and cybersecurity managers are highly demanding jobs in leading manufacturing companies. Big data must be analyzed, since ignoring the data analytics or performing poor data analysis could lead to waste in the manufacturing process and loss of profit. A conceptual framework was developed to investigate if the inefficient usage of data has a negative impact on manufacturing performance through the decision-making process.

Semi-structured interviews were conducted in leading manufacturing companies in Sweden that are following lean principles. A new form of waste, digital waste, was defined. This paper suggests considering digital waste as a new part of '*muda*' (waste), which is its theoretical contribution. From the practical perspective, the results of the paper encourages practitioners to pay extra attention to data analytics, work on reduction of digital waste and establish new revenue channels based on data analysis.

Keywords: lean management, digitalization, digital waste, muda.

DISTRIBUTION CHALLENGES OF HEALTH COMMODITIES

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ABSTRACT

Distance to service in Ghana remains a binding constraint for contraceptive health commodities use among rural and urban populace. The distances to goods and services in rural areas is still high, while in urban areas where demand for smaller families is greater, distance is a binding constraint even though average distances are smaller. Expanding access to a choice of affordable and appropriate health commodities such as contraceptive is critical to achieving the goal of reproductive health for all health commodities contraceptive that are considered to be overlooked or underutilized. The objective of this paper is to assess the efficiency of the existing distribution networks and recommend an alternative supply chain distribution network through geographical equi-distance supply chain distribution network. A case study approach was used where purposive sampling was employed to select a major player in distribution of health commodities in Ghana. It was found that geo-equi distance supply chain distribution network for health commodities can improve efficient distribution of health commodities in developing countries. The benefits of efficient supply chain distribution network include improved commodity availability, reduced lead time and improved healthcare delivery.

Keywords: health commodity, supply chain distribution network, geographical equi-distance

DISTRIBUTION PROCESS DESIGN TO IMPROVE SUSTAINABILITY MANUFACTURING EFFICIENCY

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ABSTRACT

Recently, sustainability manufacturing has a great attention by researcher and practitioner. Sustainable manufacturing is the design of manufactured that can maximize positive impact to environmental while conserving energy and natural resources. It must cover the entire process within the company, not only in the production process but also distribution process. Distribution process is one of the marketing activities that directly relate to consumers and has a large enough role in creating the benefits of an item. Mapping the process to find out the process suitability of the company towards the principle of sustainable manufacturing needs to be done in order to find out which points need to be improved. The mapping can use sustainable value stream mapping. Mapping on a furniture company gives results that there are several problems in packaging and stuffing processes. The focus of the research chose stuffing because it has the most problems, starting from economic performance: poor cost efficiency (28.1%), bad time efficiency (28.1%), bad worker satisfaction (46.47%), bad training level (0%), and poor safety level (36.84%). These problems will be reduced by material handling investments. Stacker is an alternative because it has material handling costs that are lower than the current cost. The company's performance result on the principle of sustainable manufacturing at the stuffing process produced economic indicators: good time efficiency (80%), good cost efficiency (90%), and good efficiency inventory (82%). Environmental indicators: good energy efficiency (80%). Social indicators: good safety level (100%) and training level remains poor (25%).

Keywords: sustainable manufacturing, sustainable value stream mapping, net present value, material handling investment.

DRIVERS AND BARRIERS FOR INLAND WATERWAY TRANSPORTATION–LESSONS LEARNT

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ABSTRACT

Inland waterway transportation in Sweden could be a substitute for road transports with the prospects of improving the environmental performance. Sweden currently has no systematic strategies or policies

for transports on inland waterways, and despite available capacity the waterways are barely utilized. In the Netherlands, for example, the inland waterway capacity is embedded in the transport system and utilized to a large extent. For a successful modal shift it is important to understand the drivers and barriers for the shift and develop strategies to leverage the drivers and mitigate the barriers. This study aims to identify drivers and barriers for IWW transportation based on successful benchmark cases in the Netherlands. Furthermore, based on the learning from these benchmarks the study aims to point out strategic actions for Sweden regarding IWW. The data for this study was collected from aww transportation organizations, shippers and local administrations in the Netherlands. The results showed that main drivers for IWW are congestion relief, cost reduction and lower environmental impact. On the other hand, main barriers are slow pace of development, high investment costs and poor hinterland connectivity. For a successful modal shift in Sweden, it is crucial to prepare governmental support, a change in stakeholders' mindset, decisive attitude to modal shift process and a strong long-term perspective.

Keywords: inland waterway transportation, intermodal transportation, modal shift, drivers, barriers, sweden.

EFFECT OF RECYCLING IN AN IMPERFECT PRODUCTION SYSTEM WITH ACCEPTANCE QUALITY LEVEL DEPENDENT DEVELOPMENT COST

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ABSTRACT

In most of the research works, on closed-loop supply chain production inventory model consisting of a virgin raw material supplier, a manufacturer, a retailer and a collector,remanufacturing and manufacturing processes have been considered in subsequent manner which produce same quality of product. Again, in some papers single product with different qualities have been considered that leads to lost sale situation. Moreover, in some papers, the quality of the remanufactured items made by the used product is considered as lower quality items than newly manufactured one made by the virgin raw material. But, in reality, less acceptance quality level of the used product needed more development cost to become new one which has not been yet studied. So to make the paper more realistic, in this model, (i) the manufacturer incorporates both the manufacturing and remanufacturing processes simultaneously to overcome lost sale situation and (ii) the acceptance quality level dependent development cost of the remanufactured items have been considered. Again, due to long run process, malfunctioning of the production system increases. So both the manufacturing and remanufacturing processes produce some defective items which are reworked within the same cycle. With these consideration, a mathematical model has been developed and solved using sequential and global optimizations. It reveals from numerical studies that the joint total profit in case of global optimization is higher than sequential optimization.

Keywords: Recycling, Imperfect production, Multi-echelon inventory, Manufacturing, Remanufacturing

EMERGING TECHNOLOGIES IN SUPPLY CHAIN: MATURITY MODEL AND ASSESSMENT INSTRUMENT

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ABSTRACT

Industrial 4.0 technology has been significantly studied and to some extent has been applied especially by the developed countries since its emergence in 2011. Such technologies as Internet of Things (IoT), Big Data Analytics, Advanced Robotics, Augmented Reality, Block chain, and others have been implemented at various levels. Their applications have proven to have a significant impact on increasing productivity and competitiveness. On the other hand, the developing countries are still struggling to grasp these advanced technologies. At company level, some have tried to implement some elements of industry 4.0 technology, some are still assessing the possibilities, while many probably do not know what to do. In this study, we develop a maturity model of industry 4.0, which is done primarily based on literature review. The maturity model is then further developed into an assessment instrument so companies can use this instrument to assess at which level they have grasp these technologies.

Keywords: Industry 4.0, Maturity Model, Technology Readiness

ENHANCING MANUFACTURING FLEXIBILITY FOR FINANCIAL PERFORMANCE: THE MEDIATING ROLE OF CULTURAL COMPATIBILITY

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ABSTRACT

Manufacturing flexibility (MF) becomes an important requirement for an effective response to market uncertainty. However, the outcomes of this relationship on financial performance often show mixed results. Identifying factors facilitating this relationship is crucial for maintaining financial performance. Drawing from social cognitive capital and uncertainty reduction theories, this study argues that cultural compatibility (cc) can mediate this relationship. Data from 150 Vietnamese manufacturers were analysed using structural equation modelling. This study showed that a strong association exists between a manufacturing firm's cc and its mf and financial performances. Besides, cc acts as a mediator to enhance mf on financial performance. Manufacturers can leverage mf to capture more market share and profits when developing a good working culture with their supply chain partners. However, as the manufacturing complexity increases, the relationship between mf and financial performance can be deteriorated significantly. These results provide awareness to manufacturers in working within a complex supply chain network.

Keywords: Manufacturing, Compatibility, Flexibility, Complexity

ENHANCING SUPPLY CHAIN CAPABILITIES IN AN ETOCONTEXT THROUGH "LEAN AND LEARN"

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ABSTRACT

Organizational learning has recently begun to emerge as the missing link to successful lean transformation. Drawing on insights from two case companies in the engineer-to-order (ETO) industry we frame the successful enhancement of supply chain delivery capabilities through a lens we call "lean and learn". Continuous improvement without learning is not lean thinking. Thus, continuous improvement is, in essence, a process of learning; where problems are identified and solutions are created, analysed, selected and implemented; resulting not only in improved performance but also in improved capability. Since the eto industry exhibits project-based production, there seem to be natural barriers and resistance to continuous improvements and thus learning. By building on the notion that an organization with an improved capability is an organization that has learned, this study examines the link between supply chain delivery capabilities and organizational learning in an ETO-context by combining analytical conceptual reasoning with meta-data collected from action research at the two case companies. The study contributes to practice by pointing out how supply chain capabilities can be enhanced in an ETO-context, and to academia by identifying and offering new knowledge to start filling the research gap between three specific research areas; supply chain management, organizational learning, and lean.

Keywords: organizational learning, lean, supply chain management, continuous improvement.

ENHANCING SUPPLY CHAIN PERFORMANCE BY SUSTAINABLE SUPPLIER SELECTION AND ORDER SPLITTING STRATEGIES

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ABSTRACT

In today's dynamic and uncertain business environment, every manufacturing or service firm does outsource activity in the form of procurement of raw materials, semi-finished and finished goods, technology etc. Therefore, suppliers are the key players to help the firms to be competitive in the market. Firms are dependent on the suppliers to meet the customer demands. Total dependence on a single supplier may create huge problems to that firm. Natural disaster, new political rules etc. Happening at supplier side may disrupt or seize the flow of supply to firm. Consequently, selecting suitable set of sustainable suppliers is a crucial activity for any organization. In this research, sustainable suppliers are selected based on set of criteria, cost, risk, flexibility and environmental responsibility. A novel approach involving fuzzy numbers, which make it easier to capture the decision maker's subjective assessment related to supplier selection criteria, are applied to make accurate and consistent sustainable supplier selection decisions. The proposed approach follows the two-stage decision making process. In the first stage, selection of suitable sustainable suppliers and splitting order among them takes place. In

the second stage, the impact of order splitting strategy on supply chain performance is examined. The efficacy and intricacy of the developed approach is validated using a real-life case.

Keywords: supply chain management, supplier selection, order splitting, performance measurement

EVALUATING THE IMPACT OF SAFETY CULTURE DIMENSIONS ON PATIENT SAFETY USING MACHINE LEARNING

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ABSTRACT

There is a growing recognition that safety culture has a huge impact on continuous improvement of patient safety and quality. As a multidimensional concept, safety culture is mainly measured through surveys in healthcare settings. The most common survey is the Hospital Survey on Patient Safety Culture (HSOPSC), created by the Agency for Healthcare Research and Quality (AHRQ), used in more than sixty countries so far. While the HSOPSC has been used satisfactorily in various healthcare settings worldwide, there has been no clear picture regarding what safety culture dimensions drive overall patient safety. To shed light on this, we used aggregate survey data from various hospitals in the US in multiple years to analyse the relationship between various safety culture dimensions and patient safety. As a machine learning tool, random forest model was used to build multiple decision trees and integrate them to get accurate and stable prediction on the relationship between aggregate safety culture dimensions and patient safety. It can be concluded that random forest model generated valuable results which may be used by hospitals to identify most significant categories that drive patient safety grade in their particular healthcare settings.

Keywords: healthcare operations, patient safety, safety culture, random forest modelling, machine learning

EVALUATION OF ADOPTING E-PROCUREMENT AND ITS IMPACT ON PERFORMANCE IN APPAREL SUPPLY CHAIN

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ABSTRACT

Apparel industry in Sri Lanka is one of the key industries in the country which represents more than 7% of Sri Lanka's GDP and employs about 15% of the country's workforce. Further apparel industry accounts for more than 50% of total exports of Sri Lanka. Procurement plays a major role in apparel

value chain in determining the cost and quality of the end products. With the development and increment in the use of technology, E-procurement has become popular in business world mainly because of the benefits it carries to the organization. In Sri Lanka most of the organizations have started the use of e-procurement blindly without estimating the costs or benefits. The research aims to measure the effect of using e-procurement on performance of apparel supply chain and to identify the barriers and benefits in usage of E-procurement. The study was conducted using information from apparel organizations who are currently using e-procurement with the objective of supporting the apparel organizations which are planning to implement e-procurement in days to come. Objectives of the research were achieved using statistical techniques; exploratory factor analysis, confirmatory factor analysis and structural equation modelling. The study concludes with statistically proven results that e-procurement usage positively impacts on the performance of apparel organizations.

Keywords: Procurement, E-procurement, Apparel, Performance, SEM, Supply Chain

EVALUATION OF THE GREEN SUPPLY CHAIN MANAGEMENT FOR ORGANIC PRODUCTS - THEORETICAL AND EMPIRICAL APPROACH

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ABSTRACT

The considerations undertaken concern the green supply chain for organic products. The authors present the development of the market for such products and the latest trends in world markets in connection with the creation and implementation of a new business strategy - relating to the implementation of environmental aspects. The aim of the discussion is to indicate the theoretical basis for the construction of the green supply chain, with particular emphasis on the specificity of organic products. Theoretical considerations are accompanied by the results of empirical research, which indicate in which areas and in the scope of implementation of which management tools there are significant differences between enterprises and what may be the reasons for this. The novelty and value of considerations is the reference to the principles and elements of the green chain to ecological products and the indication why a holistic approach to environmental protection should be promoted (i.e. production and the whole supply chain promoting the principles of sustainable development). The analysis of literature, methods of descriptive and mathematical statistics and ANOVA analysis were used in the considerations..

Keywords: green supply chain management, ANOVA, evaluation, indicators.

EXPLORING MACHINE LEARNING APPLICATIONS IN SUPPLY CHAIN MANAGEMENT

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ABSTRACT

In the current technological era, the rise of disruptive innovations is affecting the way industries run their operations. The disruptive impact of digitalization processes and the highly constant growth of sensible data are changing the very fabric of supply chain management. Disruptive technology offers innovative ways to tackle some of the main traditional approaches in the supply chain. Machine learning, which is viewed as disruptive technology, recently has evolved rapidly to optimize the process and efficiency in supply chain management. Machine learning could be applied in several stages of supply chain management from planning to the distribution process. In this paper, we explored and examined the literature of multiple machine learning algorithms and their application in the supply chain management, focusing on the demand forecasting stage since this the first and most important step of supply chain management. A total of 57 articles related to machine learning and demand forecasting were retrieved from sciencedirect, taylor and francis, and emerald databases. The result showed that the machine learning algorithm performs better than the traditional demand forecasting model. Moreover, neural network and support vector regression algorithms are among the most potential and applicable algorithms to implement in demand forecasting. The practical implication of this paper is in exposing the current machine learning issues in the industry to help stakeholders and decision-makers better plan corrective actions.

Keywords: disruptive technology, machine learning, supply chain management, demand forecasting

EXPLORING THE IMPACT OF INNOVATIVENESS OF HOSPITALITY SERVICE OPERATION ON CUSTOMER SATISFACTION

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ABSTRACT

Service innovation is critical for service improvement and development that enhance customer satisfaction. Besides the importance of technology and tangible products, innovativeness leverages customer satisfaction by stimulating their five senses perception. Service-dominant logic emphasises the role of innovativeness in service delivery align with customer perception to create service innovation. In other words, innovativeness is the innovative service clues that drive customer perception and attitude in experiencing the intangible values of the operation. Despite the importance of innovativeness, studies for the issue appears to be limited and especially scarce on empirical practice. Thus, this study aims to explore the impact of innovativeness on customer satisfaction in the case of hospitality operations. The study examined and validated the innovativeness framework with customers' perception of boutique hotel operations. A set of hypotheses are proposed based on the existing literature and an approximate of 1000 reviews on TripAdvisor website. The reviewers are the foreign customers of 20 boutique hotels throughout Vietnam. The thematic analysis with deductive approach was employed to determine the key themes of innovativeness that influence customer satisfaction. The findings confirm the innovativeness framework with 1) innovative humanic clues, 2) innovative mechanic clues and 3) innovative functional clues to influence customer transaction-specific satisfaction; and hypothesise the influence of attitude which are novelty, meaningfulness, complexity and affordability in term of overall satisfaction that leads to behavioural intentions. The model provides explanation of how customers perceive innovativeness through the five senses and their attitude toward the innovativeness of the operations. The study, therefore, addresses the importance of innovativeness in service operation management to satisfy customer expectation for a new experience.

Keywords: service innovation, innovativeness, service-dominant logic, transaction-specific satisfaction, overall satisfaction, boutique hotel.

EXPLORING THE KEY FACTOR CATEGORIES FOR THE DIGITAL SUPPLY CHAIN

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ABSTRACT

The digital supply chain (DSc) phenomenon has recently emerged as a result of the advancement in technology, complexity, and dynamics of today's competitive market. Researchers have explored the competitive advantage of moving from the traditional supply chain to the digital supply chain. Some of the most apparent benefits include the integration of the physical supply chain with digital technology, in real time, to optimize organizational performance through the improvement of supply chain visibility, responsiveness, robustness, and resilience. On the other hand, this transformation of the supply chain brings with it a host of challenges and issues that might make organizations "more vulnerable" and a "source of chaos." The digital supply chain phenomenon is still in the preliminary stages of academic research, and the literature review is "fragmented." In this research, we explored the existing digital supply chain literature to identify and classify factors for organizations to migrate from the traditional supply chain to the digital supply chain. We used a systematic literature review method to analyze papers matching our research criteria. Structured content analysis was used to review 106 English articles published in peer-reviewed and accredited journals from 2002 to 2019. The result showed that supply chain integration, collaboration, coordination, strategy, technology & worker skills, and adaptability are among the significant factor categories that should be addressed to assess the readiness of an organization to adopt a digital supply chain.

Keywords: supply chain, digitalization, industry 4.0

FACTORS AFFECTING IOT ADOPTION IN FOOD SUPPLY CHAIN MANAGEMENT

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ABSTRACT

Increasing trends and interest in Food Supply Chain Management (FSCM) research has been documented over the years. The food supply chain is more complex and challenging to manage as compared other supply chains as it involves critical food conditions including quality, safety, and freshness. As the advancement of technology reshapes society and consumer behavior, the current

emerging challenge for FSCM is to meet the increasing demand and the higher expectations of food quality from the customers. Adopting disruptive technology such as IoT may be an attainable way to upgrade and reshape a smart FSCM in the environment of Industry 4.0. The IoT emerges as a data-driven technology that is promising to bring significant improvement to FSCM as a whole system. Nonetheless, the tendency to employ IoT in FSCM varies across organizations due to various reasons. With this knowledge, the purpose of this paper was to investigate and identify factors affecting the adoption of IoT as a disruptive technology in supply chain management. To meet our objectives of this research, we employed a systematic literature review of 45 peer-reviewed journal articles on the topic of IoT in supply chain management. The review findings showed that factors affecting IoT adoption vary in terms of context and approach used. The list of the most important factors included performance perceived benefit, cost, data complexity, compatibility, technical knowledge, hardware & infrastructure, peers and government support, security & privacy concern, and adoption willingness.

Keywords: Food Supply Chain Management (FSCM), disruptive technology, IoT

FACTORS OF KAIZEN TRANSFERABILITY IN NON-JAPANESE CULTURES

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ABSTRACT

To date, Japan's key success secret for its internationally known quality and excellence is not well shared or acknowledged in some parts of the world. The level of understanding and realization of this Japanese recipe for quality is diverse among the least developed, developing, and developed countries. Developed nations efficiently capitalized on the Japanese management philosophy and benefited greatly, as reported in several studies in the literature. On the contrary, only a handful of studies can be found on the adoption of kaizen philosophy in developing countries. The existing literature emphasizes the need to carry on more research to discover where the developing nations stand in terms of the Japanese management philosophy and its effectiveness on productivity. Challenges associated with facing acceptance and the transferability of kaizen as Japanese management philosophy have been the focus of discussion in the recent studies. Therefore, this research aimed to identify factors affecting the kaizen transferability in non-Japanese cultures by answering the question of; what are the significant factors (internal and external) affecting the transferability and adoption of kaizen as the Japanese management philosophy in a non-Japanese culture? Based on literature review findings and practices, we included six main factors: employee participation and personal initiative, the discipline of employees, the eagerness of employees, top management commitment, organization structure, and organization culture.

Keywords: kaizen, Japanese management philosophy, transferability, lean.

FASHION PRODUCT DEMAND PREDICTION BASED ON ARTIFICIAL NEURAL NETWORK CONSIDERING PRODUCT VARIANCE

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ABSTRACT

Demand prediction is a crucial activity in managing supply chain. It is going to trigger all operational activities in supply chain. In fashion industry, demand prediction becomes challenging. Previous researchers have identified many factors are affecting demand of fashion product. Short life cycle, trend, season, high product variance are among factors that creating complexity in fashion product demand prediction. This research develops demand prediction model based on artificial neural network for fashion product considering product variance. The model applied backpropagation technique as training algorithm with Lavenberg-Marquadt training function. Application of the model in real industrial data is showing promising result.

Keywords: fashion product, demand prediction, artificial neural network

FEASIBILITY OF ANALYTICAL HIERARCHY PROCESS AS A TOOL FOR RESHORING DECISIONS

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ABSTRACT

Reshoring decision making is least explored as these decisions are complex and time-consuming. Numerous quantitative and qualitative criteria need to be considered in the decision-making. The existing decision-making tools are few and theoretical and lack automatic decision support capabilities. Therefore, there is a need of automatic and rapid decision support tool for reshoring decision making. One of the more well-known systematic decision-making tools is analytical hierarchy process (AHP) that has been used to handle complex decision problems in operations management domain. This study aims to investigate the feasibility of AHP as a tool for reshoring decision-making. In order to achieve this, the AHP was applied to six reshoring criteria on an overall level, which also correspond to competitive priorities. First, a hierarchy of criteria was constructed, then the pairwise comparison of each criteria pair was made, then the final priority weights of the criteria were calculated, and finally the consistency of the comparisons was checked. The criteria quality and cost obtained higher priority weights in reshoring decision. Later, the final priority weights of the criteria were used to evaluate fifteen different reshoring decision scenarios and compared against reshoring expert's opinion. It was found that thirteen of these decision evaluations were correct on comparing the AHP outputs and the expert's opinion. Only two of the evaluations were not in agreement, however the confidence values on these decisions were very small. Therefore, this research shows that AHP is a feasible tool for reshoring

decision making on an overall level of criteria. The tool can be adapted to different decision makers and different reshoring types. The tool provides automatic support for reshoring decisions.

Keywords: reshoring decision making, AHP, decision support tool, manufacturing location.

FORWARD AND REVERSE SUPPLY CHAIN NETWORK DESIGN FOR NEW AND REFURBISHED PRODUCTS IN E-COMMERCE LOGISTICS

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ABSTRACT

In recent trends, the customer's satisfactions are a major concern to the e-commerce companies and immense growth in the selling of refurbished and finished products in the online market. Nowadays, the customers' have two choices either go for the new products or refurbished products based on available budgets. For this, e-commerce companies focused to develop the forward and reverse logistics supply chain network design within the same time horizon, so that transportation cost could minimize and will not cause major effects on the final selling cost of products. Therefore, e-commerce logistics service providers starving towards to design the forward and reverse supply chain network design for multi-period. To address the complexity associated with manufacturers, e-commerce platform, e-commerce logistic company, suppliers, retailers, and customers, this paper studies the forward-reverse supply chain network design with customer pickup and demand facility within the promising time horizon as per GPS module. We have developed a mixed integer non-linear programming (minlp) model to minimize the total expected cost which involves material cost, production cost, material cost for return units, shortage cost, purchasing cost, recycling cost, inventory holding cost, repairing cost, disposal cost and transportation cost associated with forward and reverse supply chain network. In case of reverse logistics, if there is any defective products available to retailers, which has to be returned by the customers, logistic service provider pick-up the scrap/defective product and transported to the respective manufacturing plants. The challenges of the proposed work is to consider all the pick-up, delivery points of retailers/customers within the promising range of time window. The fruit-fly algorithm and genetic algorithm are proposed to solve the proposed model. The computational experiment shows the comparative chart for all practical case studies.

Keywords: forward and reverse logistics, refurbished products, multi modal transportation, meta-heuristic

FUZZY LOGIC IN A RESHORING DECISION-MAKING CONTEXT

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ABSTRACT

This paper investigates the feasibility of using fuzzy logic for reshoring decision-making. To achieve this a fuzzy logic system for reshoring decision-making was implemented. The system was configured in two different ways to cover the two main fuzzy logic modeling approaches and sixteen fuzzy inference settings were used in each configuration. The research shows that fuzzy logic is a feasible method for reshoring decision-making. The reduced rule base configuration was more accurate than the complete rule base configuration. However, the reduced rule base also generated more conflicts in particular settings. Among all the fuzzy inference settings used in this research, one of the settings outperformed the others. With regard to the particular inference methods, the research show that maximum is the preferred aggregation method while middle of maximum is the preferred defuzzification method.

Keywords: reshoring, fuzzy logic, decision-making, decision-support, manufacturing location decision.

GREEN PRODUCTION INVENTORY MODEL WITH CAP AND TRADE POLICY FOR GREENHOUSE GAS EMISSION

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ABSTRACT

Greenness of a product is a vital issue of production industries and also the human beings of all over the world. Greenness of a product is defined as how much a product is eco-friendly with the environment or suitable for living beings. This work deals with the formulation of a model of production inventory problem of green production factory which produces both perfect and imperfect items . The rate of production of imperfect items is dependent of time. In this model, demand is considered as green level dependent of a product. Here it is also assumed that the greenhouse gases is emitted during production time and destroy time for unusable product. Since ecosystem is badly affected by greenhouse gases, it is the duty of every concern of manufacturing firm to control greenhouse emission for living beings. For validating the proposed model, a numerical example has been considered and solved. Finally, sensitivity analyses have been carried out with respect to the different system parameters of the model.

Keywords: Green product, Imperfect production, Inventory, Greenhouse gas

GREEN SUPPLY CHAIN MANAGEMENT: A RESEARCH AGENDA

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ABSTRACT

Green supply chain management (GSCM) practices are gaining popularity among Malaysian small and medium enterprises (SMES), which is being increasingly implemented. Although previous research focused on GSCM practices and its outcomes extensively, most of the research based on developed countries. Limited research has been done about GSCM and its outcome in Malaysia. The purpose of this paper is to identify different types of GSCM practices and performance outcomes in Malaysian context. This paper will compare GSCM research at global level with the existing GSCM research in Malaysia to explore further directions of GSCM research in Malaysia.

Keywords: green supply chain management (GSCM), small and medium enterprises (SMES)

GREEN SUPPLY CHAIN MANAGEMENT MEASUREMENT IN DEFENSE COMPANY IN INDONESIA

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ABSTRACT

In each production process, it will always produce waste. Based on waste data in 2018, there are several wastes produced, one of the waste is expired chemical waste. Actually it can be prevented by managing good inventory. This issues indicate that there is an implementation of green supply chain management (GSCM) that needs to be addressed. In applying the GSCM concept, a performance evaluation is needed to monitor the performance that has been done, and needed to determine the right solution according to the measurement results. Pt. Xyz is a defense company, which one of its products is special vehicle.pt. Xyz has its own performance measurement system, but this measurement system is still focused on controlling the quality assurance and health safety environment. This research was conducted to measure the performance of GSCM at pt. Xyz in the special vehicle division by integrating all aspects of the supply chain in its measurement system, then the remedial solution can be determined to improve the performance of green supply chain management. Based on the results, the performance value is 86.54, it indicates that GSCM's performance at pt. Xyz falls into the good category. Of the 19 kpis used, 1 kpi was included in the red category, 4 kpis were in the yellow category, and 14 kpis were in the green category. To improve performance in the bad category that is the number of suppliers with iso 14001, it is necessary to provide guidance to current suppliers about environmental certification, companies with types of manufacturers and distributors who have warehouses obliged to have environmental

certification. Also, pt. Xyz need to include environmental certification standard into supplier selection specifications to increase supplier with iso 14001 certified

Keywords: green supply chain management, green scor, snorm de boer

HOW ECONOMIC INTEREST IMPACT ON SCM PERFORMANCE?

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ABSTRACT

Recently the number of bilateral free trade agreements (FTAs) has surpassed multilateral or plurilateral FTAs by international and regional organizations (e.g. WTO, EU); partly due to inefficiencies in their negotiation processes. It has also been demonstrated (Butter and Mosch, 2003) that more formal (e.g. legal) and informal (e.g. norms and values) trust mechanisms between trading partners increase their trade. FTAs can be seen as one such formal trust mechanism between the signatory countries. If one achieves a trustworthy status and more formal and informal economic ties for their trading partner, it is reasonable, and to a certain extent expected, to share both benefits and risks. That is, minimize and/or prevent the partner's opportunistic behavior. This, in turn, allows lowering of both ex-ante and ex-post transaction costs (Williamson, 1985, Dyer and Chu, 2003, Kwon, Hamilton and Hong, 2011). It could thus be hypothesized that logistical performance also improves among trading partners with the appropriate trust mechanisms in place. This research will investigate the above using inferential statistical analysis of secondary data. Suitable proxies will be selected for both formal and informal trust mechanisms and economic ties to investigate their effects on the Logistics Performance Index (LPI). The LPI is reported by the World Bank and comprises six measures; viz. customs, infrastructure, international shipments, logistics competence, tracking & tracing and timeliness. The number of bi-, multi-, and plurilateral FTAs of each country will be used as a proxy of the formal trust mechanisms, while a range of indicators (e.g. corruption index, political stability, industrial disputes and relations) will be used as proxies for informal trust mechanisms. This study focuses on how formal and economic ties and interest impacts including potential FTAs in the future on SCM performance.

Keywords: Free Trade Agreement, SCM performance, Logistics Performance Index, Trust, Transaction Cost

HYBRID SIMULATION AND INTEGER LINEAR PROGRAMMING MODEL FOR INTERMODAL DISTRIBUTION: A CASE STUDY OF FERTILIZER COMPANY IN INDONESIA

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ABSTRACT

The company currently delivers fertilizer using trucks with a capacity of 16 tons directly from factory to distributor. In practice, trucks deliver fertilizer more than their capacity that causes frequent traffic accidents. It prompted the Indonesian government to make regulations that prohibit trucks from carrying loads that exceed their capacity. If the regulation is fully implemented, it will significantly increase the cost of distribution. Therefore, the company intensively tries to find ways to reduce delivery

costs. Currently, the company considering intermodal delivery as an alternative in delivering fertilizer to distributor. In this alternative, bulk fertilizer is sent by ship, then bulk fertilizer is brought by the truck to the packing plant and after bagging, the fertilizer is sent by truck to the distributor. The company needs to determine optimal combination of direct delivery using trucks and intermodal delivery in bulk using ships and trucks. Intermodal delivery, in this case, is a complex problem. It is because there are uncertainty and interdependency between stages in the delivery. Therefore, simulation is used to estimate capacity of packing plant. The simulation model is sub-model of integer linear programming (ILP) model. The output of simulation model will be used as right-hand-side (RHS) of capacity constraint in the ILP model. In addition, sensitivity analysis has been done to explore characteristics of solution in some different ship capacity and some overload thresholds capacity in regulation. The optimal solution of the ILP model shows two important insights that are many district warehouses are still more efficient to be supplied directly by truck from factory and the farther the distributor's location, the more chance it will be supplied via intermodal delivery.

Keywords: intermodal, integer linear programming, simulation, distribution

IMPACT OF ERP USAGE ON OPERATIONAL PERFORMANCE OF SRI LANKAN MANUFACTURING COMPANIES

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ABSTRACT

Today most businesses are changing from being function driven to being process driven entities and the integration of business processes is achieved through enterprise resource planning (erp). ERP is a process where a company, often a manufacturer, manages and integrates the important parts of its business. Therefore ERP systems are becoming popular among business organizations globally as well as locally. Currently Sri Lankan manufacturing companies are considering the implementation of ERP system but the information on benefits arising from ERP usage is limited due to lack of research in this area. Therefore this study aims to identify the current level of ERP usage in Sri Lankan manufacturing companies and its impact on operational performance. For this purpose, a standard questionnaire was used for primary data collection, gathered from manufacturing companies that are currently using any type of ERP software. Data was analysed using both descriptive and inferential statistics. The study found that the level of ERP usage in Sri Lankan manufacturing companies are at average level and there is a significant impact of ERP usage on operational performance. These findings will be supported for manufacturing companies for making decision to use ERP for their business activities.

Keywords: ERP usage, operational performance, manufacturing companies

IMPACT OF GLOBAL AGRI-FOOD COMMODITY FLOWS ON FOOD AND FEED SAFETY

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ABSTRACT

The agri-food industry has rapidly globalized due to the constant growth of international trade during the last decades. Outsourcing and offshoring of production processes have led to an increased diversity and a high number of entities, processes and localizations as well as an enhanced complexity in product and information flow. Global, highly interconnected agri-food supply chains may create food safety risks and vulnerabilities at multiple points at the various supply chain stages. In the area of risk management, the evaluation of health risks (risk assessment), as well as in the field of early risk identification the focus has so far been on the supply chain stages "(primary) production", "processing" and "wholesale and retailing". The processes between these stages - the global commodity flows - were not yet sufficiently taken into account. The resulting knowledge gaps in the field of international logistics may pose challenges for risk assessors. We developed a comprehensive Conceptual framework (CF) of global agricultural bulk commodity (ABC) flows in order to understand the complexities of the international logistics sector and to systematize research in that field of food safety. The CF was constructed based on a qualitative approach using Grounded Theory. ABC flows are illustrated and characterized by three categories: 1. Processes, 2. Core actors and 3. Routes and nodes. Influential sectors are differentiated in two categories: I. Logistics-related conditions and II. Drivers of change. Further, food safety concepts were identified: A. Management,B. Coordination / Cooperation, C. Quality and capacity of routes and nodes, D. Diversity of logistics-related conditions and E. Dynamics of driver of change. In addition, the CF served as the basis for the identification of critical factors related to food safety through expert interviews. The CF and preliminary results of the expert interviews with representatives from the international logistics and agricultural trade sector as well as from the food and feed industry will be presented.

Keywords: food safety, globalization, vulnerabilities

IMPLEMENTATION TRAFFIC CONTROL ALGORITHM FOR MULTI-AGV SYSTEM

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ABSTRACT

Automated Guided Vehicle (AGV) systems are being used in many industrial warehouses for part transferring process and the major challenge is the management of traffic between multiple AGVS. AGV traffic control system with an anti-collision path planning algorithm which can increase the efficiency of the part transferring process in the warehouse. This paper discussed and compared several path planning algorithms and traffic control algorithms that can be implemented for the warehouse agv systems that have multiple AGV robots. This also proposed the most efficient traffic control algorithm and path planning algorithm with the implementation of the anti-collision algorithm. The proposed

AGV traffic control system can be further improved to implement an anti-collision AGV traffic control system in warehouses in Sri Lanka and will be presented as future work in this paper.

Keywords: anti-collision, traffic control, warehouse agv system, supply chain, material handling.

IMPROVEMENT OF INFORMATION FLOW FOR RAIL FREIGHT TRANSPORTATION

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ABSTRACT

Rail freight transportation is one of important modes for freight transport as it is good for bulk materials, agricultural goods and containers. In order to save logistics and transportation cost, many companies select to transport their goods by rail. However, in Thailand the rail freight/transportation is only 1 percent of the transportation mode share which majority is in road transport, followed by water transportation. It is known that major problem why companies do not use rail freight transport is the inability to trace or track their goods. Companies may not know where the goods and arrival are. Therefore, this research was focused on developing the information flow linkage among all parties involving in the supply chain. The study started from the shipping from the plants' doors to the customers' doors focusing on the information flow and the data requirements. Finally, the research finding will help to connect the information along all parties and help the customers know where the goods are which is good for traceability. The case of state railway of Thailand (SRT) practice will be illustrated to reflect the problems and suggest solutions for improvement.

Keywords: rail freight transportation, traceability, information flow, data modelling

INFUSION OF DRY PORTS IN MALAYSIAN CONTAINER SEAPORT SYSTEM: A PREPARATION TOWARDS UNPREDICTABILITY IN GLOCALISATION-CENTRIC TRADE SYSTEM

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ABSTRACT

A container revolution which arose from economic liberalisation together with globalisation have thought the importance of regionalisation in order to survive in this rapidly changing economic trend. Malaysia which faced a tremendous implication from these economic transitions, have pressurised the seaport system in the nation by affecting its competitiveness level. In order to preserve it competitiveness level, the concept of regionalisation has been adapted in this region. Hence, dry ports

have been aligned in the Malaysian container seaport system to ensure seaports have additional capacity and flexibility to cope with the trend of world economic system. Therefore this paper, analyses benefits of dry ports in the Malaysian container seaport system to various key stakeholders. By conducting face-to-face interviews with experts in the shipping industry as well as with support from secondary data, this paper analyse the opportunities that these dry ports poses for future development. In addition to this, this paper also reveals the possible strategies that can be adapted by these specific intermodal terminals for operational enhancement in the nation's trade system. The findings indicated that the presence of dry ports provide substantial benefits to stakeholders in the seaport system such as reducing waiting times for ships, increasing the efficiency in transport chain, preventing long customs clearance at seaports, balancing road and rail transport for container distribution and decreasing total freight cost. Furthermore, accessibility to the international transportation network and the government's international and national economic development plans are additional opportunity owned by dry ports in this region. Moreover, some recommendations have been provided especially on the aspect of transportation, inter/intra-regional planning, interoperability, location, collaboration planning, marketing, safety and security as well as dry port service diversifications. These findings indicate that dry ports in a reliable inland network assist seaports and other stakeholders to increase their sustainability in the dynamic maritime trade.

Keywords: dry port, malaysia, seaport, competitiveness, stakeholders, spin-off benefits

INTRODUCING TRAMP AND LINER SHIPPING MODEL TO PRODUCTION PLANNING

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ABSTRACT

Since the complexity of globalization and the importance of the transportation process, global manufacturers need to consider production planning with complex transportation situation. The constant value of transportation process is not accurate and leads to total cost increasing. Corresponding to different supplying network, appropriate transportation modes with nonconstant value should be considered with production planning simultaneously. The proposed model aims to assist managers to make decisions about production allocation, transportation mode selection, shipping contracts by volume with carriers and vessel companies under a given network. This study develops a global production–shipping planning model that incorporates a decision on transportation mode after considering the cost function of different transportation modes from the shipper's point of view. We propose tramp shipping, liner shipping mode into production-shipping planning, considering transshipment and consolidation to exploit economies of scale under a given network. We present mathematical formulations of tramp, liner modes. In order to verify the effectiveness of the proposed modes, we present a practical case study that is motivated by a real-world example. The two modes are compared and discussed in numerical examples. The advantages and disadvantages of the two modes are discussed in different situations. The result is a decision aided system to support production–shipping planning in selecting the optimal transportation mode.

Keywords: production-shipping planning, maritime transportation, tramp shipping model, liner shipping model

INVOLVING SUPPLIERS IN A LEAN TRAINING PROGRAM

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ABSTRACT

The purpose of this study is to investigate the outcomes of a manufacturer involving its suppliers in their lean training program. A single in-depth case study is conducted to examine a lean training program that was offered by Scania to five suppliers. Semi-structured interviews were conducted at Scania and these suppliers to explore the outcomes of the training program. The interview findings were triangulated by completing observations and focus groups at the suppliers. Four main outcomes are identified after the completion of the training program. First, the suppliers became easier to collaborate with due to better internal ways of working and more trust in terms of reliability. Second, the suppliers improved their ability to identify possible problems that could jeopardize deliveries. Third, the suppliers improved their delivery precision. Fourth and finally, financially unstable suppliers were less perceptive to the lean training program than financially stable suppliers. This study also proposes avenues for future research.

Keywords: Lean training program, implementation, suppliers, development, collaboration, culture, quality management

JOINT PROMOTIONS AND INVENTORY DECISIONS

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ABSTRACT

We present a model that combines price promotions and inventory decisions, in order to evaluate the effect of these two factors on a firm's profitability. More importantly, we want to investigate whether these two factors can complement one another in the firm's effort to increase its profits. The model treats the annual number of promotions that the firm should adopt as a decision variable. The model considers an annual price-depended demand, and following the extensive marketing literature on promotions, assumes that price promotions increase monthly demand and demand variability. This affects inventory decisions such as ordering quantities and safety stocks. A sensitivity analysis shows the effects of all model parameters (marketing and operational) on the annual number of promotions adopted by the firm, providing interesting managerial insights.

Keywords: Price Promotions, Safety Inventory, Marketing and Operations Interface

KNOWLEDGE TRANSFER FOR THE NEXT GENERATION OF LOGISTICS EXPERTS

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ABSTRACT

The occupational field of logistics is undergoing a considerable transformation, as new technologies are arising and economic, environmental as well as social conditions are significantly changing. In addition, the logistics sector is facing problems to attract well-skilled employees. Adequately preparing the next generation of logistics experts plays a central role to master these challenges. To be most effective, logistics education should not be limited to academic programs or company trainings, but already take place at schools. Thus, logistics topics should be included in curricula of different school types and taught in high quality to school students. This does not only increase the knowledge about logistics at an early stage but also raise interest for future careers in logistics. Therefore, this work presents the initiative "Research and Education on Transport Logistics" (RETrans) and discusses its potential to empower logistics education and to overcome prejudices among potential future employees. The initiative's mission is to build a competence center for transport logistics in cooperation with stakeholders from research, industry, and the public sector. Central to the project is its open online platform providing information and learning materials on the transport modes rail, road, and inland waterway, efficient logistics processes, new technologies and innovations, as well as sustainable freight transport. All materials are freely available and can be used by different school types. Various instruments, such as curricula analysis, expert workshops, surveys, and analysis of secondary data, contribute to the design of the online platform. The research project "Research and Education on Transport Logistics" is supported by the Austrian Federal Ministry for Transport, Innovation and Technology and the SCHIG mbH.

Keywords: logistics education; knowledge transfer; logistics initiative; transport logistics; online platform

LAST MILE DELIVERY AS A COMPETITIVE LOGISTICS SERVICE IN VIETNAM – A CASE OF DHL E-COMMERCE VIETNAM

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ABSTRACT

Currently, as e-commerce is bustling in Vietnam, last-mile delivery logistics (lmd) has become one of the key competitive services of online retailers. Lmd is defined as the last stretch of the delivery process to end consumers, playing a critical role in ensuring customer experience. Effective lmd does not only affect customer experience but also make a significant impact in terms of reduced transport cost, fuel

emission and increased resource utilization. At the same time, it is also facing challenges including rising fuel prices, failed deliveries and parking issues. Lmd in Vietnam has evolved at an impressive rate since local delivery service providers have been competing by leveraging technology to make it more responsive to meet customers' needs. This paper describes a case study of how dhl ecommerce (Vietnam), an international logistics firm, employs lmd in its supply chain strategy to provide competitive logistics service for the local online retailers. Initial findings indicate that the current dhl e-commerce's lmd operation model and service offerings provide delivery tracking, high occurrence cash remittance for sellers, and dense service points network as their competitive offerings. The new parcel metro service, on the other hand, is expected to be one the sustainable competitive advantage since it is unique and valuable to the local retailers.

Keywords: last mile delivery, dhl ecommerce Vietnam, dhl, logistics, supply chain management, ecommerce, competitive logistics service,

LEADERSHIP AND PERFORMANCE: THE CASE OF AUSTRALIAN SMES IN THE SERVICES SECTOR

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ABSTRACT

The population of this study comprises the small and medium-sized categories of smes in the service sector in australia. Services have become a driving force in the global economy representing the most dynamic sector in international commerce. In smes suitable leadership is important to organizational success and performance. The leadership style of the manager in large part may impact the behaviors of the followers and thus impact on organisational performance. This study aims to investigate the influence of leadership behaviours on the performance of australian smes located in the services sector. 313 senior managers of services smes in australia participated in the study. The results revealed that: a) there were significant relationships between leadership behaviours and growth of s smes; b) there were insignificant relationships between leadership behaviours and profitability of smes, and c) transformational leadership contributed more significantly to sme growth than transactional leadership behaviour.

Keywords transformational leadership, transactional leadership, organisational performance, services sector, smes, australia.

LINER SHIPPING NETWORK DESIGN IN INDONESIA "SEA-TOLL" AGENDA: TANJUNG PERAK CORRIDOR

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ABSTRACT

The Sea – Toll Agenda is one of the most ambitious initiatives of the Indonesian government to reduce the economic disparity between eastern and western regions in Indonesia. This program provides integrated logistics network for maritime sector in the form of subsidized liner shipping operation. However, after four years of implementation, this network is still underperforming, which concerns some operation issues, such as a high Round-Trip-Voyage (averagely 30 days per voyage). In addition, the budget for Sea – Toll operation is increasing around 45% each year because the government attempts to target more ports for this program. This thesis intends to offer a proposed network for the Sea – Toll Agenda to improve its performance in terms of vessel operation and total shipping cost.

The methodological approach is built based on the LSND (Liner Shipping Network Design) model to unravel the complex problem of establishing network into three decision levels, i.e., strategic, tactical, and operational. The k-means clustering algorithm accommodated our idea to group the set of port involved in the Sea – Toll Agenda into several clusters based on their distance. Then, a TSP (Travelling Salesman Problem) method is performed to yield the most efficient path to connect all ports and generate the Clustering Network. Some network options (Port Aggregation & Butterfly Hub) and scenarios (additional and backflow cargo) are developed from the Clustering Network to obtain the best-proposed network by comparing them with the current Sea – Toll Network in terms of operation planning and shipping cost performance.

Our thesis finds that the k-means clustering algorithm and the TSP model can generate a Clustering Network that has a lowest total distance (10,776 nm). However, the Butterfly Hub option offers the lowest total cost among others. This option can reduce about 50% of the total cost and save around 60% of the subsidy compared with the current Sea – Toll Network. Moreover, the proposed network can provide a better regularity (14 days round-trip-voyage) using half of the number of vessels operating on the Sea – Toll option.

The finding, obtained from the additional and backflow cargo scenarios, suggests that the government should consider to revoke the policy of goods limitation in Sea – Toll Agenda. Both scenarios are capable of improving the network by providing more subsidy saving (10% lower than proposed network) and a competitive unit cost per TEU (770 USD/TEU) compared to the cost from initial Sea – Toll Network (1,830 USD/TEU). A sensitivity analysis shows these results are quite robust to changes in the model parameters.

Key Word: Maritime Logistics, Sea-Toll, TSP, K-Means Clustering

LOCAL DISTRIBUTION OF ORGANIC FOOD: A REVIEW AND RESEARCH AGENDA

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ABSTRACT

There has been an increasing consumer demand for local and organic food as they are considered to be more sustainable, ecological and healthier. The 'conventional' long food distribution system is inadequate to fulfill these requirements. Consequently, short distribution systems for local and organic food have been gaining popularity, that is not only sustainable but also contribute to food security and answers local consumer demand. One of them that addresses these concerns is alternative food networks (AFNs). AFNs emerged as a food provisioning system linked with reciprocal ties that promote a sustainable and civil economy, environment, biodiversity and respect for farming tradition. However, the AFNs are facing a challenge to maximize the distribution of local and organic products in the long term. The purpose of the paper is to make a review of the existing short food distribution systems for local and organic food and propose a research agenda. In order to achieve this, a literature review on short food distribution systems is conducted and different food distribution channels within AFNs are studied. The challenges for each food distribution channel are identified and then compared to 'conventional' distribution systems. As a main finding of the study, a framework with the main challenges of the existing short food distribution channels within AFNs are presented. This gives the general criteria to consider while designing a short food distribution system that closely connects consumer and farmers of local and organic food. The policy implication is to create favorable conditions to encourage short food distribution systems in the long term. The research implication is to gather further empirical evidence on how the framework can be operationalized into the creation of a short food distribution system in a specific location context.

Keywords: food distribution system, alternative food networks, distribution channels, sustainability, localness.

LOCKER FACILITY ALOCATION FOR DELIVERY OF GOODS IN THE E-COMMERCE BUSINESS

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ABSTRACT

In urban logistics, long distance shipments from warehouses to consumer are becoming difficult with continued e-commerce growth. This requires complex planning and scheduling to minimize global travel costs, but often experiences challenges such as lowering the economies of scale in the transportation system, including high levels of load fragmentation and low use of vehicle load compartments. In this study, we propose allocation of locker facilities for delivery point of goods in the e-commerce business. Automatic lockers are spread out at the location determined from the model developed in this study. This locker serves as an effective alternative solution to a gathering point of goods sent by the seller, as well as a gathering point for end customers who take items purchased from the e-commerce. We specifically discuss the set covering problem by considering the population density in each region. We attempt to optimize the location facilities by providing several options of the scope to cover the maximum customer. This problem is applied to a 42-node census tract representation of city center of Gresik.

Keywords: Locker allocation, e-commerce, city logistics, set covering problem

LOGISTIC PARTNERSHIP IN THE FOOD SUPPLY CHAINS MANAGEMENT IN THE CONTEXT OF INTERNATIONAL EXPANSION

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ABSTRACT

The purpose of this paper is the literature review about food supply chain management and research analyze of a logistic partnership choice within food industry enterprises in the aspect international markets expansion. Based on the reviewed literature, the most important aspects of cooperation between the various links of the food supply chain and the factors determining the level of this cooperation were identified. An important issue was also discussed, which is measuring and assessing the integration of the food supply chain. Based on our own survey analysis, using the correlation of r-pearson and linear regression analysis, the relationship between the choices of individual logistic partnership in the aspect international expansion was indicated. The food industry is one of the largest and most complex production sectors in the world economy. By the same this sector also contributes to the phenomenon of food waste. Previous studies show that two-thirds of the wasted food is occurred in supply chain and connected mainly with harvesting, shipping and storage. Therefore, taking into account the trend of sustainable development, the subject of food supply chain management and the effective cooperation to reduce waste in this chain is very important. The research is important not only from the economic, but also from the social point of view, because it gives the attention to the issue of cooperation that is important in the context of food waste reduction. The conducted research is a starting point for further analyses regarding the optimization of the dependents identified in the practical part the selection of logistic partners.

Keywords: food supply chain management, integrity of food supply chains, cooperation of food supply chains, measuring supply chain integration, international markets expansion.

LOGISTICS SETUPS IN A THIRD-GENERATION PORT

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ABSTRACT

This paper investigates the feasibility of different logistics solutions, or so-called setups, in a third-generation port. To achieve this, a simulation model imitating the work of a real third-generation port was developed. Four experiments with different logistics setups (the size and number of shipped consignments to the port, dispatching time, deployed truck fleet, etc.). Have been configured and evaluated in the simulation model. The research shows that effective material transfer from the plant to the port can be provided, if a pull-system is applied instead of traditional push-system. This approach allows goods to be delivered just-in-time with the minimum costs of labour and material resources.

Keywords: logistics, port generations, just-in-time concept, simulation modelling, pulling systems.

MANAGEMENT AND DESIGN OF ROBOTIC SORTING SYSTEMS

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ABSTRACT

Ecommerce fulfilment operations require rapid sorting solutions for parcels in hubs. Autonomous robotic sorting is a new method to sort parcels cheaply, on a very small footprint. Such robotic sorting systems can now be not only in sorting centers, but also in some ecommerce warehouses. We discuss new queueing-network based models that incorporate congestion of the robots. Such models may help to optimally design such systems for cost and performance, as well as to evaluate different operational policies. We evaluate single and multiple-tier solutions, combined with different driving path topologies and different assignment rules of robots to workstations. By We show the models are accurate by comparing them with simulation and then use them to show that, for both layout types, a square layout is close to optimal and the shortest path topologies lead to shorter throughput times with acceptable congestion levels. We also compare the robotic sorting systems with a conventional cross-belt loop sorter for cost. For low to moderate values of the required throughput capacity, robotic sorter systems are best. However, beyond a critical limit, cross-belt sorters are the cheaper solution.

Keywords: Robotic sorting, Automated warehouses, Queueing networks, performance estimation, simulation

MANAGEMENT OF CYBER SECURITY THREATS IN THE FACTORIES OF THE FUTURE SUPPLY CHAINS

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ABSTRACT

Today there are numerous Factories of the Future initiatives delivering different Industry 4.0 applications to manufacturing industry supply chains. However, in the future, Factory of the Future is not going to be a simple manufacturing asset, nor a sum of isolated assets. Instead, it will comprise a network of factories, which is considered in a System of Systems approach. The current challenge is to propose novel architectures, technologies and methodologies to optimize the level of efficiency and security of this System of Systems in a context where every step towards digitization exposes the manufacturing process to a widening array of cyber threats. This paper discusses about the management of cyber threats in System of Systems operations and supply chains. The next generation System of Systems are using different technologies with the combination of human aspects from workers, managers, entrepreneurs and decision makers. In addition, economically there are limitations on how much to invest on different technologies and human aspects. In addition, monetary and financial flows are under the burden of cyber risks. This study will therefore embrace the technical, economic and human dimensions at once. This study is based on a European-wide multi-national research project, the aim of which is to define – through different use-cases - the preventive and reactive capabilities to address cyber and physical threats and safety concerns in System of Systems. The study indicates different cyber challenges related to the future manufacturing business and operational models, with a special attention on "as-a-service" business model. The paper also indicates managerial and practical views on the management of cyber threats in future business models.

Keywords: cyber threats, business models, Factories of the Future, System of Systems

MODELING OF THE AREA OF TRANSPORTATION MOVEMENT NETWORK POTENTIAL FLOOD FOR DISASTER MITIGATION CASE STUDY: BANDUNG RAYA AREA

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ABSTRACT

Understanding the phenomenon of flooding through the history of past flood events is the key to understanding the characteristics of the rainy season, so that disaster mitigation can be carried out to control, either through policy or regulatory arrangements, utilization of various technologies, delivery of logistical assistance, and future community participation. The movement traffic model is a mathematical model of real world traffic, but not limited to road traffic. Movement traffic modeling very much refers to theoretical foundations such as network theory and certain theories of physics such as kinematic wave models. The attractive quantity that is modeled and measured is the flow of traffic, namely the mobile unit (such as a vehicle) per time and the capacity of the transportation medium (for example the width of the road or lane). The model can teach how to ensure optimal flow with a minimum number of bottlenecks. These stages include trip generation, travel distribution, and fashion choices. Travel distribution has a choice analysis that tells which walkers will use a particular mode. For trip analysis, please know the number of walkers on each route and link. There are several methods of route selection analysis such as Long-standing techniques, Heuristic Procedures, and Equilibrium assignment. The User Equilibrium (STUE) Stochastic Taxonomy Model is an alternative route selection model that is expected to answer the challenges of the transportation engineering world in finding an effective and efficient optimal route model, especially the method those prospects for the implementation of high-performance computers in large-scale and complex transportation networks (Alhadi, 2004). The STUE model is a route selection model that considers stochastic effects and capacity constraints. Stochastic effect means considering the factors of road users' perceptions of the travel time as an optimal route

Keywords: Traffic movement model, Route selection, Highway Capacity Manual, road service performance

MULTI OBJECTIVE RELIEF DISTRIBUTION SYSTEM MODEL FOR VOLCANO DISASTER VICTIMS

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ABSTRACT

Because of locating in the circle of fire, Indonesia has around 30% of all volcanoes in the world. After the volcano erupted, the area around volcano damaged, many people lost their houses, jobs and possibilities to live in there. Before the volcano erupts, people who live around the volcano must be

evacuated as soon as possible to one of available shelters. In the shelters, drinking water, food and medicine are needed by victims who were evacuated to survive during several period aftermath of disaster. To distribute reliefs to all shelters effectively, we developed a multi-objective of relief distribution model. This distribution system model aims to determine the allocation of various types of relief items to several shelters with a minimum total cost and balanced service level between locations. This multi-objective of relief distribution model considered multi-item, multi-period, multi-vehicle and multi-trip by using pre-emptive goal programming approach. This optimization model was applied to the numerical example based on Semeru Mount as the highest active volcanoes in Indonesia, which is located in Lumajang, East Java.

Keywords: relief distribution model, multi-objective optimization, pre-emptive goal programming

NEW APPROACH TO ESTIMATE CUSTOMER SATISFACTION LEVEL

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ABSTRACT

Customer satisfaction becomes target of any product design and development programs. That is why it is very importance to measure the customer satisfaction accurately. Contemporary customer satisfaction, both the actual and the expected ones, are estimated or measured by mean of customer survey. Measuring customer satisfaction using customer survey may include some drawbacks. This situation causes bias or un-reliable results and takes times. By nature, customer satisfaction level strongly depends on the product performance even though some other aspects such as its supports and environment on how the product is delivered to the customer should also be considered. This paper proposes a new way to measure the expected customer satisfaction using the product feature performance target. This approach involves the use of the Kano's categorization that classifies product attributes with respect to its impact on the customer satisfaction. Mathematical model for each product attribute categories are formulated. The formula then is used to determine the expected customer satisfaction for any intended product feature performance target. This approach may be of value for product designers conducting what-if analysis during a product design process..

Keywords: Customer satisfaction, Measurement, Model, Performance, Product design, Survey

NEW FUTURE FOR SUSTAINABILITY AND INDUSTRIAL DEVELOPMENT: SUCCESS IN BLOCKCHAIN, INTERNET OF PRODUCTION, AND CLOUD COMPUTING TECHNOLOGY

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ABSTRACT

The industrial operation, as we know, is transitioning. Newly emerging innovations and digitization techniques, now play a vital role to transform manufacturing activities beyond the natural materials

selection requirement, energy savings, and waste reduction. Here, we explore new concepts and review technological drivers, including, big data, Cyber-Physical Systems (CPS), high-speed internet, and the Internet of Things (IOT) application to promote smes operational performance. The purpose of this study is to support the improvement of competitiveness in production and sustainability in the industrial sector, citing nascent technological approaches. We aim to understand the applicability, and awareness level of selected techno-innovation strategies: Internet of Production, cloud computing, and blockchain technology to bolster productivity in the manufacturing and service sector. A survey is conducted, comprising of experts; University faculties, reputable IT-savvy specialists, and managers of innovation-minded corporations to draw inference on outlooks for techno-innovation success in the near future. The results proffer strategies to ameliorate the limitation of new technological initiatives to transform industrial operations and sustainably promote productivity. More so, the article is a contribution to the body of knowledge on the subject matter, giving insight to technicalities, challenges, and a series of recommendations for future industry development.

Keywords: Internet of production, cloud computing, blockchain, techno-innovation

PERFORMANCE EVALUATION OF PROFESSIONAL SERVICES SUPPLY NETWORK: A MULTI-CRITERIA DECISION-MAKING APPROACH

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ABSTRACT

Professional services supply chain are a set of organized sequences that provide technical, clerical, knowledge based services to the clientele to achieve a specific result. Such supply chains are mostly seen in various domains such as health care, judiciary, real estate, social work sector, tourism, financial services, and humanitarian logistics and to a large extent in the area of after services provided by the product manufacturer. With the availability of the information and ease in information flow the professional services supply chains, often operate as a service network. Broadly such professional service networks can be classified into three categories: a) the services dealing with after sales services (partial services managed by the owner of supply network), b) professional service outsourcing (services monitored by the owner of supply network) and c) sector specific professional services (complete services managed by the owner of the supply network).

In this present work, we look into specific characteristics of the professional service networks and provide a generic approach to evaluate its performance. The performance of the service supply chain network can be classified into a. Output based performance and b. Process based performance. In this present work, we propose two approaches (one each) to evaluate the performance of the professional service network. In order to obtain a holistic view of the performance evaluation, multiple criteria needs to be considered. Here, we present a multi-criteria decision making based approach for performance evaluation. A hypothetical example is illustrated for this purpose. We hope that this approach would help better understanding of the professional service supply network and help improve its performance.

Keywords: Professional Services, Supply Network, Performance evaluation, Multi-criteria decision making

PERFORMING SUPPLY CHAIN DESIGN ACTIVITIES DURING PRODUCT DEVELOPMENT PROJECTS: A SYSTEMATICNLITERATURE REVIEW

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ABSTRACT

The purpose of this research is to provide a state-of-the-art overview of the supply chain design (scd) activities that an oem can perform when developing new products. This purpose is realized by systematically examining peer-reviewed journal articles written in English. The search strategy adopted in this research is based on selected databases and keywords. Cross-referencing is used to identify additional relevant articles. This resulted in a synthesis sample of 93 relevant articles. From this synthesis sample, a set of scd activities that can be performed by oems during product development projects are extracted. These activities are discussed by using a subset articles (47) from the synthesis sample.

Keywords: supply chain design, integrated product development, concurrent engineering, design for x, systematic literature review

PROPOSED DESIGN OF INTELLIGENT INSPECTION SYSTEM FOR QUALITY CONTROL PROCESS

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ABSTRACT

A quality control process mostly relies on a robust inspection process in order to have accurate data to be analyzed for the purpose of quality management. An intelligent inspection system is employed for automatic the inspection process. Choosing this system requires an integrated understanding of quality control process within the production system, instead of the budget consideration. This paper offers the design methodology of intelligent inspection system especially for connecting with the seven tools of quality. First, the required data characteristic of cause and effect diagram, check sheet, control chart, histogram, pareto chart, scatter diagram, flow chart, and run chart should be determined of how the data can be captured. The source of data mostly coming from the process of inspection and added with the previous knowledge of the production system. The inspection process can be designed using an

automated process such as the use of sensors and cameras. The digital image processing has been used to simplify the process and using an efficient required tool. The inspection variables for the seven tools are attached to the image captured through a value interpolation mechanism. The additional step is to identify the required component for the designed system such as camera, conveyor, part or product handling and subsequent action to handle the rejected product. Following the proposed methodology that has been used for designing the intelligent inspection system for various type of product will have a robust and suitable system to align with quality control procedures.

Keywords: intelligent inspection system, digital image processing, quality control.

PURCHASING AS A LEVER OF INNOVATIONS IN ERA OF DIGITAL TRANSFORMATION

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ABSTRACT

Digitalization offers breakthrough possibilities within supply chain management and there is a growing need for implementation of digital technologies in various business processes. The use of digital technologies in purchasing is in the early stages of its development. However, purchasing is evolving towards a strategic leadership function in delivering value in supply chains. The importance of purchasing function is especially emphasized in development of innovations both in internal (with other business functions) and external cooperation with suppliers. Main purpose of the paper is to explore the role of purchasing function as a lever of innovation development and to define significance of emerging digital technologies within this process. To research the phenomenon empirically, two surveys and three in-depth case studies were conducted in 2016-2019. It has been confirmed that suppliers are the most important partners in producers' supply chains in development of innovations, regardless of their type. This trend emphasizes the importance of purchasing within supply chain management. In addition, purchasing function is increasingly involved in cross-functional innovation development projects in companies and is beginning to play a leading role in them. Best practices of chosen companies indicate that emerging digital technologies become more and more important catalyst of internal and external collaboration on innovation development, with proactive participation of purchasing function. Furthermore, digital technologies transform the role of purchasing in innovation development process. This function not only buys innovations as before, but significantly increases focal company innovativeness by collaborating with internal customers and external suppliers. Moreover, digital technologies drive both internal customers and suppliers to take the initiative and offer innovative ideas. Research results enrich the purchasing literature and business practice, emphasizing huge potential for using purchasing function as a lever of innovations in era of digital transformation.

Keywords: supply chain management, purchasing, buyer-supplier relationship, innovation development, digitalization, best practices.

REDUCING OCCURRENCE OF TRANSFORMER FAILURE FROM 0.75% TO 0.35% USING TOOLS OF LEAN SIX SIGMA

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ABSTRACT

In today's global business environment, quality cannot be under estimated or overlooked by any firm, whether it is a manufacturing firm or a service firm, regardless of its size or assets. The challenge for business today is to produce quality products efficiently and in a cost effective manner. Quality management is concerned with the understanding of the principles of total quality that allows the organization to become more effective and competitive in its performance characteristics viz; cost efficiency, quality, dependability and flexibility. Firm promotes a positive attitude by adopting or approaching to cultivate supplies and customers and to stay close to firm for total benefit. It has become a global approach for restructuring business processes and seeking continuous business improvements. The customers have gained renewed focus and unprecedented competitive processes have become the norm. Total quality management is essentially about the development of an ideology, a philosophy, method of actions that are designed to satisfy customers completely, through continuous improvement. The total quality philosophy is an approach that focuses all of the resources of an organization or the continues and simultaneous improvement of both quality and productivity. The purpose of total quality approach is to continually improve the organization's performance and in turn competitiveness. To support develop and adhere a process of continuous improvement it is needless for and organization to use a selection of tools and techniques. Some of the tools and techniques are simple while some are more complex. The tools and techniques, along with management practices and the organizational infrastructure are fundamental components of total quality management. However, one should not view quality management only from tool based perspective and fail to see the management practices and infrastructure required to make use of these tools successfully. When used properly, these tools and techniques are powerful and effective in helping organization to design products and processes and to identify and solve quality problems that will ultimately lead to better customer value and operational performance. Top management have a vital role to play in implementing total quality management for overall global welfare . Well-developed tools and approaches are available. They have to deploy tools effectively with a knowledge involvement and commitment. Researchers have used FISH BONE DIAGRAM and PROCESS FLOW ANALYSIS Tool. All the Hypothesis are validated and conclusion meets with the required objectives.

Keywords: DMAIC, six sigma, CTQ, VOC

RELIABLE QUALITY MANAGEMENT IN ROAD FREIGHT OPERATIONS

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ABSTRACT

Whilst social, economic, environmental and operational variables have often received attention in improving freight performance, there still exists a silent absence of deep-rooted frameworks on reliable quality management of road freight transportation and delivery. In view of such paucity, the target of this study is to attempt the incorporation of workable models, elaborating the menace of non-value added variables in appraising the severity of incompliance effects. The introduction of controllability capability of organizations in overcoming the events and consequences of freight schedule disruptions can strongly assist in streamlining the quality of road freight management. In doing so, a reliable quality priority number is proposed. The considered variables were found capable of improving effectiveness in freight management.

Keywords: Road freight, Transportation, Delivery, Reliable quality, Controllability

RESCUE AND RELIEF OPERATION AFTER A DEVASTATING FIRE ACCIDENT: A HUMANITARIAN LOGISTICS-BASED MODELING APPROACH

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ABSTRACT

The frequency of fire disasters is fortunately low, but planning the logistics and related routings for rescue, relief, and rehabilitations operations are major issues in launching any humanitarian assistance. In addition to the logistics planning issues, the reasons for the occurrence of the fire disasters should also be determined so that measures may be put in place to prevent future disasters as well as any potential consequences that may occur after the fire is extinguished. Most cities have efficient fire departments quipped with resources and fire brigades to initiate immediate measures to control the fire and to start the rescue operation. Moreover, most governments take steps to provide relief and rehabilitation assistance to the affected population. Rescue, relief, and rehabilitation steps in traffic-congested cities, especially in heavily populated areas with many businesses and markets, are highly challenging. This research proposes a mathematical modeling-based approach for planning the transportation of relief and rescue resources; conducting relief and rescue operations; and outlining

measures to prevent future recurrences. The model will be illustrated using the chemical explosion-fed fire which occurred on February 20, 2019 in the old part of Dhaka in Bangladesh.

Keywords: Humanitarian logistics, rescue and relief operations, routing of resources, fire disasters, logistics in traffic-congested areas

RESEARCH ON COMPLEMENTARITY BUSINESS MODEL OF FRESH E-RETAILER DRIVEN BY CONSUMERS' DEMAND: A CASE STUDY BASED ON THE COOPERATION BETWEEN YIGUO AND XIACHUFANG

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ABSTRACT

Monotonous product providing of fresh e-retailer is difficult to meet consumers' higher demand for fresh agricultural products and related service, which means fresh e-retailer needs to make innovation through cooperation to improve the quality of fresh agricultural products and services. Taking the cooperation between Yiguo(fresh e-retailer) and Xiachufang (online social community platform) as a typical case, we collect multiple sources of related data and use ground theory approach to process it. Through data analysis, we show how fresh e-retailer realizes her business model innovation in a complementary way based on consumers' demand. Moreover, we obtain four elements (value proposition, key resources, key processes, profit model) of fresh e-retailer complementarity business model. The value proposition is realized by providing customized fresh agricultural products and services or carrying out content marketing strategy. Key resources needed by fresh e-retailer and her partners mainly includes fresh supply chain resources and social networking operation resources. Key processes based on key resources consist of consumers' demand expression, consumers' demand acquisition and consumers' demand satisfaction. Profit model, the evidence of value acquisition realization, is optimized by innovating revenue pattern and adjusting cost structure. On this basis, the operation mechanism has been induced by analyzing the interrelationship of the four elements deeply.

Keywords: Fresh agricultural supply chain; business model innovation; e-retailer; case study

RICE EXPORT VOLUME FORECASTING IN VIET NAM USING ARTIFICIAL NEURAL NETWORK

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ABSTRACT

Rice export plays a vital role in the development of social-economy in Vietnam. This paper proposes the use of an artificial neural network (ANN) to forecast the rice export volume in this country. In our research, the monthly statistical data between 2005 and 2017 from General Statistics Office of Vietnam were gathered. The ANN model uses previous productions to predict the export demand at a time point. In our experiments, three traditional forecast methods including Holt-Winters, decomposition and combination of them were also implemented and compared with the ANN model. To test results, a hold-out period of the last 12 months was employed to test the accuracy while the remaining one was utilized for training. The evaluation of the forecast accuracy is based on the mean absolute deviation and mean absolute percentage error. The results have shown that the ANN-based approach gives superior results than conventional techniques. Although there have been several methods which use ANN to develop forecasting model, this paper uses the ANN combining with detrending and deseasoning technique and can be considered as an original one which is the best match to rice export forecasting in Vietnam at this time.

Keywords: Artificial neural network, rice export, time-series forecasting

RISK ANALYSIS IN SUPPLY CHAIN AT SMALL MEDIUM ENTERPRISE FOR CLAM AND SEAWEED (KERULA) CRACKERS PRODUCTS

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ABSTRACT

The large ammount of clams and seaweed has not been managed very well by local small medium enterprise (sme). Supply chain management is kind of a system that arrange the flow of material, information and money between suppliers to end customers. Kerula is blended product of clam and seaweed (*kerang and rumput laut, kerula*). The problem is determining risk in supply chain at sme in sumberasih sub-district probolinggo east java, is not able to process the clams and seaweed into food

products which is interested by the indigenous people. The purpose of this research is to identify supply chain of kerula product in sme in sumberasih sub-district, and to overcome the problem of risk management and increase the added value in the supply chain of kerula product by using data collection methods such as observation, literature study, interviews, and questionnaires involved. This research use data collection then the data is processed by using fmea which contains three parameters, namely severity, occurrence and detection. This method provides solutions for supply chain management that integrate the elements to reduce and minimize the risks. This SME in Sumberasih sub-district has one supply chain network which is supplier, agents, shop and customers. The result from fmea method means that to improve the implementation of supply chain management in Sumberasih sub-district can be done with handling the risks that occurs when the selection of raw materials, storage and so on. The maximum rpn is 448 that means difficulties in selling products. This research correspond to the previous research.

Keywords: kerula product supply chain network, FMEA, severity level, risk priority number.

RISK ASSESSMENT BASED ON BUSINESS CONTINUITY MANAGEMENT OF HARBOR TUG SHIPPING OPERATIONS

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ABSTRACT

The high frequency of ship traffic calling at port may stimulate an increasing port incident. This is related to less risk management plan for ships calling at port. The impact of the mismanagement of ship handling at a port may be detrimental to many parties such as crew, company, ship, cargoes carried and environment surrounding the destination port. The high number of accidents encourages companies particularly harbor tug shipping company to apply the Business Continuity Management (BCM) system. BCM includes Business Continuous Plans (BCP) that handle every potential accident in the company. Several stages in conducting risk assessment are: identification of each risk that is in PT. X, grouping each risk, and conducting risk assessment with the best worst method. In doing risk identification questionnaire and interviews were used. The results of the risk assessment found that the risk of experiencing a deviation in stages from the highest is: a tugboat collision with a value of 0.61; changes in customer tastes with a value of 0.45; engine failure on ships with a value of 0.45; and the availability of delayed parts with a value of 0.39. The study concluded that the highest deviation value is due to tugboat collision. The mitigation or recommendations are provided in reducing or preventing risks of handling ship traffic at ports

Keywords: Best worst method, business continuity management, risk assessment

RISK GOVERNACE FOR PROTECTING CRITICAL INFRASTRUCTURE SUPPLY CHAINS: TOWARDS A CONCEPTUAL MULTI-LEVEL FRAMEWORK

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ABSTRACT

A core issue in supply chain management is how independent decision makers in many tiers could work together, and how this joint work could be governed. However, in supply chain risk management (SCRM), focus has mostly been on how "focal private companies" apply SCRM processes to identify, analyse and mitigate risk related to upstream and downstream flows in their supply network. The purpose of this study is to develop the term *supply chain risk governance* with a corresponding conceptual framework that captures all types of supply chains and involved actors. Based on a cross-disciplinary literature study, we dissect, compare and combine *risk governance* with inter-organisational aspects of *SCRM*. Focus is on the context of societal critical infrastructures and its governance to increase resilience.

Key word: Risk governance, Supply chain risk management, Governance mechanisms

RISK POOLING AND STOCK ALLOCATION UNDER COST AND DEMAND UNCERTAINTY

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ABSTRACT

In this paper we consider central procurement of a commodity under stochastically evolving and correlated price and demand processes, as well as the timing and quantity of allocation to demand locations. Buying and selling commodities are becoming operational decisions for many sectors. As commodity prices randomly evolve over time, and due to dependencies between demand and price processes, a better understanding of the joint price and demand risks involved in these decisions has academic as well as practical relevance. We employ multi echelon inventory theory methods, and stochastic processes commonly used in financial engineering and operations management literature. We obtain optimal centralized order quantity, and optimal allocation of this quantity among locations, up to a verifiable allocation assumption. We present structural results on the optimal timing of stock allocation. We give a novel interpretation of the allocation quantities in terms of the allocation of forecasted budget (that is, the forecast of demand multiplied by the future price) for satisfying the demand. The research considered explains the effectiveness of procurement alliances or centralized procurement activities for an exchange-traded commodity. We present optimality results that generalize available multi-echelon inventory theory findings for such a commodity under randomly evolving and correlated purchase price and demand process. This implies that by employing standard operations management tools and techniques along with financial engineering models, decision makers can obtain

easy to apply guidelines for ordering and centrally allocating a commodity. We obtain bounds on the benefits obtained by using the suggested approach. With respect to the timing of the allocation, we present conditions for which the allocation is either delayed as much as possible, or each demand location should place an order separately.

Keywords: Risk management, price uncertainty, supply chain management, Logistics and Transportation, Energy Related Operations

SIMULATION MODELING FOR AUTOMATED PHARMACY DISPENSING SYSTEM: A CASE STUDY IN HOSPITAL

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ABSTRACT

In the past, pharmacists were focusing on product compounding and dispensing. Nowadays, pharmacy profession has moved from a product-oriented to patient-oriented with multidisciplinary team, which required reduction of pharmacist's workload and rely on Automated Dispensing System (ADS) to reduce those workloads. Investing on the ADS has a financial risk. It is suggested to evaluate its performance before implement. Simulation models are developed to investigate possible risks and expect highest benefits from the investment. The aim of this study is to develop a simulation model for investigate the implementation factors and design new business processes for implementing the ADS. This research is conducted at the Out-Patient Department of public hospital under Ministry of Higher Education Science Research and Innovation (HESRI) with special administration system by firstly modeling an Integration Definition for Function Modeling (IDEF0). Then it would be beneficial to analyze workflow and implementing simulation models by Arena software version 16 to predict the situations on different assumptions to get the most suitable situation. This study focuses on two performance indicators, dispensing time which the hospital target is patients received medicine within 10 minutes, and pharmacist workforce. The results showed that the dispensing time, which achieve the target and full time equivalent (FTE) of pharmacist of ADS model 1 and ADS model 2 were 99.31%, 99.18% and 9.01, 12.07 respectively. Compared to the current system, only 94.5% of patients achieve targets and required 26.4 FTE of pharmacists. In summary, both model 1 and 2 can reduce dispensing time and pharmacist workforce.

Keywords: Business Process Reengineering, Automated Dispensing System, Simulations, Pharmac

STUDY OF VESSEL OPERATION IN INDONESIA "SEA – TOLL" AGENDA

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ABSTRACT

In order to develop and improve logistics performance in Indonesia, Government passed the Presidential Regulation No. 26 of 2012 about Blueprint of Development of the National Logistics System. One of the strategic plan outlined in the concept of maritime logistics as the backbone of national logistics. Governments specifically launched the idea of Indonesia "Sea-Toll" Agenda as the

embodiment of the development of the maritime logistics concept. One of the route concepts for "Sea-Toll" Agenda is called "Pendulum Nusantara." This route provides for 3,000 TEU ships, so that ship voyages swing shaped regularly from Aceh to Papua.

However, the current conditions, the flow of cargo moving in western regions, exceeds the flow of cargo moving in the eastern region. According to the Data Warehouse and Business Intelligence System od the Research and Development Ministry of Transportation, the ratio of the charge flow in the western and eastern regions in 2011 was 90:10. The estimation results indicate that in 2017, the charge will have the proportions of 88:12. Unfortunately, inequality has not been a concern in the implementation plan of maritime highway operations in Indonesia.

This paper seeks to provide an efficient ship operation plan on the Indonesia "Sea-Toll" by considering the change imbalance between the western and eastern regions. The approach used is a quantitative method by modifying the model Anna (2013) that was considered suitable for the business processes of Indonesia "Sea-Toll" Agenda. A vehicle transporting cargo on the object of study is a Ro-Ro vessel. This study will result in a decision on the operation of the vessel in Indonesia "Sea-Toll" Route. The decision variables are the number and type of vessel, departure schedule, and the arrival of the vessel. Additionally, quantity cargoes transported on any departure. This study used the unit cost performance criteria for assessing the performance of the system.

Key Word: Maritime Logistics, Sea-Toll, Ro-Ro Vessels, Unit Cost

SUPPLY CHAIN COORDINATION UNDER VENDOR MANAGED INVENTORY SYSTEM CONSIDERING CARBON EMISSION FOR IMPERFECT QUALITY DETERIORATING ITEMS

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ABSTRACT

Inventory management and transportation are the main activities in supply chains that generate carbon emissions in many industries. The industries will produce carbon emission significantly to keep maintaining their item well, especially deteriorating items. Recently, many researchers focus on reducing carbon emissions regarding carbon policy that set in the industries. This study considers supply chain coordination between single supplier and buyer, mixing with Vendor Managed Inventory system to manage inventory decision considering carbon emission and imperfect quality deteriorating items. The transportation scenario of supplier delivering the product to the buyer using two different cases, the first is when the supplier transports the products by single-setup-single-delivery policy, and the second is single-setup-multiple-delivery policy. Carbon emission cost is also calculated under carbon tax policy. The aim of this study is to minimize the total cost and reduce the total carbon emission considering the optimum delivery quantity and the number of deliveries per production cycle. Numerical example and the sensitivity analysis will be provided to show the solution of the proposed model.

Keywords: supply chain, vendor managed inventory, carbon emission, imperfect quality, deteriorating items.

SUPPLY CHAIN RISK MANAGEMENT OF FISHERY PRODUCTS IN SURABAYA TRADITIONAL MARKET

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ABSTRACT

The aim of this writing is to analyse the function of supply chain risk management of fishery products in fourteen Surabaya traditional markets. A framework in supply chain risk management employ to provide knowledge the supply chain risk in the distribution of fishery products as well as its impact on this commodity business performance. The supply chain risk management assessment is able to forecast and anticipated the possible disruption of supply chain in the future. By forecasting and anticipating the potential disruption in its flow of goods, services and information of fishery products, the sustainability aspect of fishery products is able to be determined precisely. Investigating the role of supply chain risk management in fishery product s will assist not only the aquaculture actors and traders in Surabaya traditional market, but also provide a benefit for end user for having an high quality products of fish in daily basis.

Keywords: Supply chain, risk management, end user costumer, fishery products

SUPPLY-PROCESSING-DISTRIBUTION MODELSFOR HOSPITAL SUPPLY CHAIN –A CASE STUDY OF HOSPITAL SUPPLY CHAIN IN THAILAND

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ABSTRACT

SPD, in term of supply chain management, is abbreviated from Supply, Processing and Distribution management. This model is first published about its application in healthcare segment. It is a new model which incorporates processes of supply-procurement, inventory management and material processing and distribution to unify hospital logistics management to enhance hospital supply chain management effectiveness. This adaptable model is successfully adopted and continuously developed by Japanese and Chinese Hospitals as the internal-hospital department function with suggestion about the adjusted application for more flexibility and corresponding to actual hospitals situations. In Thailand, SPD model is usually used in network of private hospitals and each hospital outsources 3PL to handle these activities in its Department of inventory management. Though 3pls are able to perform logistics functions well with their expertise, in practice, they still face some inevitable problems because each-site has to separately perform logistics activities by itself. With its competitive advantage, flexibility and some internal-hospital practice constraints, this paper aims to design potential external-hospital SPD models managed by 3pls for the private hospital network in Thailand. The results, nine potential models are constructed which could be the 3pls' improvement opportunities in appropriate adoption for their contexts.

Keywords: SPD model, Hospital supply chain, Private hospital network, Third party logistics provider

SUSTAINABLE DEVELOPMENT IN AN IMPERFECT PRODUCTION SYSTEM BY CONTROLLING GREENHOUSE GAS EMISSION

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ABSTRACT

In this article, an economic production quantity (EPQ) model with imperfect production system has been presented. The manufacturing system, shifts from in-control-state to out-of-control state after a certain time, which is considered as a random variable. In this manufacturing System, it is assumed that the manufacturer pays greenhouse gas (GHG) emission tax to the government due to environmental regulation and the corresponding GHG emission cost depending on the production rate of the manufacturer. Also, a new type of screening process has been considered. Here, it has been shown that, how the manufacturer can stimulate the demand by reducing the selling price along with how he/she can maximized his/her profit by balancing the market situation. Finally, different numerical examples have been considered and also a sensitivity analysis has been carried out to get the impact of some parameters on the optimum decision.

Keywords: Sustainable development, imperfect production, screening, greenhouse gas emission

SYSTEM DYNAMIC MODELING FOR CARGO NON-KS DELIVERY REVENUE IMPROVEMENT IN CGD DRY-PORT

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ABSTRACT

CGD Dry Port is a dry port that uses rail transportation mode as facilities of container transporter for the distribution of goods between regions. Control of Over Dimension Over Loaded (ODOL) has an impact on increasing demand for delivery the goods at the CGD Dry Port mainly demand delivery of Non-KS goods. CGD Dry Port hasn't been able to handle the demand delivery of Non-KS cargo in full. This research aims to determine the factors that can affect the Non-KS delivery volume and design improvement to improve the Non-KS delivery volume using system dynamics simulation. The study commences by problem identification, model conceptual design, stock-flow diagram development, implement base case simulation, validate model, and improvement scenario plan. It is found that the delivery volume of KS products influences the Non-KS delivery volume. The total capacity of delivery is affected by the capacity of carriages container and delivery patterns. The GD 54 type carriage

container has improved by our simulation. It was originally 48 tons, then becomes to 49 tons. Thus, we enhance the pattern of delivery into 20 times in a month, which has initially been 15 times. Based on the results of the improvement scenario, the average delivery volume of Non-KS amount reaches 7476,48 tons/month in which the existing conditions amount only 3227 tons/month. Hence, the estimated income goes up until IDR 388.230.336/month in compare to the current revenue of IDR 164.917.505/month.

Keywords: Dry Port, ODOL, Simulation, System Dynamics

THE CHALLENGES OF EMERGING TECHNOLOGIES: THE EXPERIENCE OF PROCUREMENT PROFESSIONALS

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ABSTRACT

This empirical research was conducted based on qualitative transcendental phenomenological approach. The in-depth interviews were conducted with 10 procurement professionals located in Malaysia. In response to globalisation and Industry 4.0, it is very crucial for procurement professionals to adopt emerging technologies in all procurement processes. The emerging technologies related to procurement include Internet of Things, Big Data, artificial intelligence, robotics and 3D printing. However, procurement professionals experience many challenges of implementing procurement technologies. This research revealed six challenges of emerging technologies as experienced by purchasing & supply managers. First, talent management is very crucial for adoption of emerging technologies. Second, difficulty to prioritize and select emerging technologies. Third, lack of electronic data interchange to achieve full implementation of e-procurement. Fourth, security issues of emerging technologies. Fifth, top management and inter-department support are required for adoption of emerging technologies. Sixth, financial constraints to invest on emerging technologies.

Keywords: Artificial intelligence, e-procurement, big data, electronic purchase orders, electronic quotations, and electronic invoices

THE CONTAINER SHIPPING FLEET PLANNING PROBLEM UNDER TRADE DISPARITIES OF NATIONAL LOGISTICS SYSTEM IN INDONESIA

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ABSTRACT

In the development of the national logistics system, Indonesian's government planned to build two international ports in Kuala Tanjung and Bitung to support the increasing volume of export and import containers. This development aims to make Indonesia no longer depend on the ports of neighboring countries. Currently, the international cargos are shipped from Indonesian ports to Port of Singapore as an international hub applying hub and spoke network concept. According to the "Sea Tollway" program, vessels with a fixed schedule are assigned to serve these networks. The long shipping routes followed by several problems, including vessel inefficiency caused by demand imbalance between each port. These imbalances are the effect of trade disparities between west and east region of Indonesia. For route with these characteristics, the network and fleet planning are important factors to improve efficiency that has a direct impact on minimizing shipping cost. In this research, we analyze the fleet planning for routes serving international container shipping from six main domestic and two international hub ports in Indonesia, which are Belawan, Tanjung Priok, Tanjung Perak, Banjarmasin, Makassar, Sorong, Kuala Tanjung, and Bitung. We developed the linear programming model modified from the Feeder Network Design Problem (FNDP). To choose the right vessel size for the routes, we added utilization as a factor that must be considered in the model. Finally, by solving the model we get the optimal vessel size and quantity for each route.

Keywords: Hub and Spoke Network, Demand Imbalance, Fleet Planning Problem, Feeder Network Design Problem.

THE DEVELOPMENT OF ONLINE PLATFORM FOR HUMANITARIAN LOGISTICS

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ABSTRACT

Whenever a disaster happens in Indonesia, there are many personal donators want to help the survivor, either transferring money or buy the donated goods at their respective place then deliver the goods to the disaster area, even though sometimes separated by an island. The objective of this paper is to suggest the online donation platform as the single gateway will be handled by Indonesian National Disaster Management Authority called BNPB according to of three metrics of the humanitarian supply chain: efficiency, equity, and efficacy. Anyone who wants to donate just opens the platform using their smartphone and desktop not only in Indonesia but all over the world and click the donation goods item that already decided by BNPB put on the cart and do the donation fare. The platform also shows accuracy the quantity status of each donation goods, in order to prevent out of stock or overstock to match the need of survivor. The donation fare transferred directly to BNPB's bank account which is a government institution to maintain transparency. For procurement and distribution wise, BNPB can prepare the donated goods from the nearest place by the impact location to keep effective, equity and efficacy. The platform will also show the donation goods status which already distribution to the last mile. This research was conducted using a qualitative approach. The result shows that the idea is very promising in dealing with the Indonesia archipelago nation, but also can be applied worldwide.

Keywords: online platform, donation goods, humanitarian logistics

THE EFFECT OF PRICING STRATEGIES ON RETAILERS: AN AGENT-BASED MODELING APPROACH

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ABSTRACT

Setting the prices for products is an essential approach for retailers to define their business success. However, there is a high uncertainty that characterizes pricing decisions. Interdependent behavior between retailer and customers making it hard to analyze the effect of a pricing strategy on retailers. The complexity increases when the customer behavior can be influenced by pricing strategies implemented by the competitors. This study examines the impact of pricing strategies on retailers by using agent-based simulation. The pricing strategies investigated are related to price promotion, which is defined based on the promotion frequency and the level of the price cut. Two types of agent are defined in the model, namely retailer and customer. The customers have a particular buying preference and a dynamic utility function, while the retailers apply either a similar pricing strategy (homogeneous agents) or different strategies (heterogeneous agents). A functional product market is considered, which represents items that are bought regularly for daily needs, such as foodstuff and toiletries. Preliminary results presented in this paper are reported for the purpose of illustration. These show that the bounded-rationality of each agent drives the emergent outcomes, and each pricing strategy results in a different impact on retailers, in terms of market share. The contribution of this study is to offer a new point of view in understanding the impact of pricing strategies on retailers.

Keywords: pricing strategy, promotion, agent-based simulation, competition

THE HALAL SUPPLY CHAINS MAPPING IN INDONESIAN TRADITIONAL MARKET AS EFFORT IN CREATING FOOD SECURITY ENVIRONMENT: AN INITIAL CONCEPT

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ABSTRACT

Thomson Reuters (2015) estimates that in 2019 the halal food market is worth USD2,537 billion (21 percent of global expenditure), the halal cosmetics market becomes USD73 billion (6.78 percent of global expenditure), and halal personal needs of USD103 billion. In Indonesian as moslem majority country, the awareness to halal products and services grow rapidly. The halal supply chain defined as the activities of all entities involved in the supply chain from upstream to downstream apply and accordance with Islamic law. From selection of suppliers, production processes, storage, to distribution. Recent public perception, halal products are identical to the food industry. According to Thomson Reuters in the State of Global Islamic Economy report (2014-2015), halal products are not just the food industry, but also include the cosmetics and pharmaceutical industries, Islamic-based financial systems,

fashion, media and recreation, and the concept of halal tourism. This pieces of paper synchronized *halal* supply chains with supply chain risk management. In the consumer perspectives, halal supply chains can provide certainty and quality of products consumed by consumers.

Keywords: Halal, Traditional Market, Security Environment

THE IMPACT OF CULTURE OF QUALITY (COQ) ON THE ORGANIZATIONAL PERFORMANCE

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ABSTRACT

Culture of Quality (COQ) is regarded as an important component of TQM however this is a relatively new theme, compared to other concepts in the quality management domain. However, literature resources on this topic are relatively scarce and there is a lack of empirical validation of the COQ framework. This study therefore aims to investigate the dimensions of the COQ and the role it plays in an organization to improve its performance. A set of hypotheses are proposed and empirically tested based on the 120 survey responses from mostly from Asian region. Findings show that COQ dimensions; leadership emphasis, message credibility, peer involvement and employee ownership encourage better employee performance. The study addresses an important research gap by empirically investigating the COQ dimensions and suggesting that from an employee perspective, organizational performance can be accelerated through quality culture management.

Keywords: COQ, leadership emphasis, message credibility, peer involvement, employee ownership, empirical study.

THE IMPACT OF SUPPLIER INVOLVEMENT ON SUPPLY CHAIN RISKS AND RESILIENCE

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ABSTRACT

Today, the aspects of managing risks and building resilience are crucial for maintaining the continuity of business processes. Therefore, it is substantial to recognize the new areas that support such activities. The main purpose of this article is to investigate whether supplier involvement in product development (SI) affects the level of supply chain risks and thus indirectly impacts supply chain resilience. The study is based on a survey conducted among 500 manufacturing companies. Several hypotheses have been defined and tested. This allowed to verify a theoretical model covering the following three research areas: supplier involvement, supply chain risks and supply chain resilience. In particular, the study confirmed that partnership during SI process positively influences supply risk reduction while

communication during SI minimizes operational risk in the company, i.e. Risk of human failures and inadequate or failed internal processes. Subsequently, reduced company's operational risk determines achieving supply chain resilience.

Keywords: supplier involvement, supply risk, operational risk, SCRES, resilience

THE IMPLEMENTATION OF LOGISTICS INFORMATION TECHNOLOGY IN MITIGATING SMES LOGISTICS CHALLENGES IN VANDERBIJLPARK

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ABSTRACT

Information and communication technologies are important logistics strategies to gain and maintain customer loyalty and to successfully implement a strategic logistics plan. SMEs long-term growth and continuity depend on the ability to cope effectively with surprises and radical changes in logistics technology. Therefore, to consider how to improve the quality of logistics service without considering the impact of information technology would be to omit from the theoretical framework one of the most important tools for controlling consistency, improving efficiency, improving logistics operations, facilitating collaboration among suppliers, promoting effective decision-making and allowing for the automation of many routing logistics activities that modern business has at its disposal. The aim of this study is to investigate the implementation of logistics information technology in mitigating logistics challenges among SMEs in vanderbijlpark. This research used a quantitative method of data collection and analysis. The data were statistically analysed using SPSS (25.0) as well as SMART-PLS (3.0) software for structural equation modelling (SEM) to assess the measurement reliability and the research structural model. The statistical results generated from the 131 SMEs that participated indicated that the absence of logistics information technology can increase both the internal and external logistics challenges. However, its implementation can result into greater knowledge and visibility across the logistics chain as well as streamlined order processing and reduced lead times. Hence this research is significant.

Keywords: Logistics, information technology, internal logistics challenges external logistics challenges

THE USE OF C4ISR IN SMART CITY FOR DISASTER MITIGATION IN ASYMMETRICAL WARFARE PERSPECTIVE

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ABSTRACT

Natural disasters are one of the threats in asymmetric warfare that occur in the revolution industry 4.0 era. As one of the asymmetric threats that disrupt the stability of the country, a comprehensive strategy and involves all components of the community in mitigating disasters. The purpose of this study is to analyze one of the technologies used in a system that is C4ISR can be applied and needs to be efficient

especially for Smart City in Indonesia for disaster mitigation. This research uses the C4ISR concept, the concept of disaster mitigation, the smart city concept and the concept of asymmetric warfare to analyze it. The research method used is the result of this study is a qualitative method that is descriptive analysis that is explaining the phenomenon under study based on data collected and processed, then analyzed using a theory that is relevant, so that a conclusion can be drawn. The results of this study are: By utilizing C4ISR technology, the system can gather information from various sources and locations, including from the point of occurrence, and be able to make effective strategies and decisions based on information from C4ISR (such as using drone integration, seismographs and high performance computing (HPC), and spread information to other devices directly.

Keywords: mitigation disaster, C4ISR, smart city, asymmetric warfare

TOWARDS SUSTAINABILITY IN SOURCING: A HYBRID MCDM APPROACH

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ABSTRACT

Recently, a growing interest in achieving sustainability development goals in business has increased in a way that challenging decision makers in seeking sustainable sourcing considering economic, environmental and social aspects. A hybrid fuzzy TOPSIS-fuzzy multi objectives optimization model was developed to solve supplier selection and order allocation problem in a three-echelon supply chain considering sustainability aspects. The objectives include minimization of expected costs, environmental impact and travel time and maximization of social impact. Fuzzy TOPSIS was employed to evaluate suppliers' performance vis-a-vis traditional, green and social criteria. The obtained performance score was then integrated into the fuzzy multi-objective model. Then, a set of Pareto solutions was derived by using the LP-metrics method. The developed fuzzy TOPSIS-fuzzy multi-objective model was validated on a three-echelon meat supply chain. This study has considered several sustainability oriented-criteria in sourcing. The research outcome revealed significant managerial and practical implications of the sourcing optimization model.

Keywords: Sustainable sourcing; Purchasing; Food supply chain; Fuzzy TOPSIS; MCDM.

UNDERSTANDING THE INFLUENCE BETWEEN BLOCKCHAIN TECHNOLOGY AND TRUST IN SUPPLY CHAIN MANAGEMENT: A LITERATURE REVIEW

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ABSTRACT

Applying Blockchain Technology (BCT) for information sharing in the supply chains is driven by many factors, but developing trust is one of the most proposed. Trust is a multidimensional intangible concept without clear agreement of what it constitutes, and its meaning get even more confused in a supply chain management (SCM) context. The purpose of this paper is to understand how applying BCT in SCM can influence trust. In the literature, there are some findings that address trust and BCT but they

are very scattered, only some related to SCM but many related to financial applications. Thus, our method used is a systematic literature review, based on a conceptual framework of trust we developed. We discovered a great gap in linking trust (and related theories) to BCT applications in SCM. This paper gave insights on the reciprocal nature of trust as well as the influence of applying BCT in SCM. In current literature, trust is highly expected as a consequence for BCT if we are considering trust in the technology. At the same time, trust is highly expected to be an antecedent for applying BCT in terms of trust in SC partners represented by openness of information sharing. Important future research agenda is to enrich the results by using empirical studies.

Keywords: Blockchain Technology, Supply Chain, Trust.

VEHICLE ROUTING MODEL FOR MILK RUN DELIVERY OF FRESH PRODUCE: THE CASE OF A 3PL SERVICE PROVIDER CATERING SUPERMARKETS

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ABSTRACT

Effective route cycle design and assignment of vehicles in a fresh fruit and vegetable delivery network is of major importance since it contributes to a significant amount of transportation cost in the supply chain. Manual vehicle routing is a complex task due to geographical dispersion of customers, delivery time windows, vehicle capacity and delivery volume constraints. The objective of proposed method is to design an algorithm and develop a computer program which minimizes the total cost of travelled distance adhering to aforementioned constraints. When constructing the model, a background study has been conducted on the operations of the 3PL service provider and defined the objective function subjected to constraints. Inputs and outputs of the model have been defined to derive the cost formulas and then the vehicle routing and scheduling algorithm was designed. The model was proposed to a single depot distributing fruits and vegetables to multiple customer locations having deterministic demand. Routes are directed with known origin and destination where the route cycle is fixed once the journey begins. The study proposes an automated vehicle routing solution comprised of vehicle capacity utilization, departure time assessment and vehicle route assignment components. The total cost calculation formula is derived considering both direct costs and opportunity costs. It utilizes the cost per distance, cost of time window violations and cost of empty space of contracted fleet. The proposed solution was validated by comparing with the manual assignment of a 3PL service provider supplying fresh produce to supermarkets. The proposed method resulted in 26% total cost reduction and 40% reduction in total distance travelled.

Keywords: Vehicle Routing Problem (VRP), Milk Run Logistics, perishable goods, time windows, equal capacity, truck schedulig

WAREHOUSE OPERATION OPTIMIZATION THROUGH ON-SITE OBSERVATION AND SIMULATION

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ABSTRACT

This paper presents a warehouse optimization model based on a theoretical evaluation framework and simulation software. The warehouse in study belongs to a leading logistics company in Vietnam and it aimed to increase order fulfilment productivity by 50% without further space expansion. The research team was contracted to identify any bottlenecks and recommend suitable changes. The study employed a warehouse maturity model as an assessment tool to establish the warehouse level of service maturity, and onsite observation over three-month period. The team found that the warehouse applied a random storage practice and lacking optimized picking route per order or multiple ones, hence resulting in low productivity in order fulfilment. In term of item storage arrangement, products were placed randomly and not designed to reduce picking effort. Regarding picking route, the picking sequence was not optimized for minimum traveling and picking time. Instead, the pickers moved back and forth between and pallets and racking areas to complete an order. As a result, the picking process took up to 70% of total processing time of an order. Furthermore, over-stacking on high stacks and poor lighting also reduced its operation efficiency. Using a self-customized warehouse operation simulation called Anylogic, the team suggested several optimal picking sequences and batch picking for immediate improvement to the order picking process. For the long run, zone picking, hot-pick area, and pick sequencing are also recommended. Quantitative improvement figures are also included in the recommendations.

Keywords: Warehouse Optimization, Warehouse management, Simulation, Picking optimization, Order fulfilment, Anylogic

WASTE ELIMINATION ACTION EVALUATION USING MANUFACTURING SYSTEM VALUE ANALYSIS

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ABSTRACT

Implementing Lean Thinking in a certain manufacturing system produce the recommendation of waste elimination. The recommendation that contains waste elimination action requires further analysis of its benefit, technical preparation, and financial consequences. The previous common approach such as severity, occurrence, and detection analysis has not yet convinced the company to directly follow the recommendation as further consideration need be taken. The proposed method in this paper, offer a further analysis to complete the recommendation based on each waste characteristic. First, benefits analysis provides the procedures of evaluation based on availability, performance, and quality as the element of overall equipment effectiveness. Benefit analysis matrix providing of how to describe the relationship between waste and availability, performance and quality variable. Next, technical preparation analysis consists of subsequent identification of man, machine, method and material. Technical preparation matrix requires information on how the resources should be identified to conduct the waste implementation action. Then, financial consequences consider both potential revenue and implementation cost. Financial matrixes have the relationship value between the revenue variable and implementation cost element. Finally, the matrixes will be summarized in the overall matrix in order to have the action rank or priority. The result of implementing this method in 3 types of companies vary in how to gather accurate data to fulfill the required value within each matrix. However, a complete set of analysis is suitable to be taken for a final decision.

Keywords: waste elimination action, manufacturing system, lean thinking.

WHAT ARE THE MOST PROMISING INNOVATIONS IN LOGISTICS?

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ABSTRACT

Transformation in logistics is driven and shaped by a wide range of innovations. Innovations range from new products, services, processes and technologies to new organizational structures and can lead to significant economic, ecological and social impacts. While innovations certainly drive change within the logistics industry, it is difficult to accurately predict which particular innovations will actually have a substantial impact on value chains. Various indicators can be utilized to anticipate change. This work puts the focus on the frequency an innovation is debated among the logistics community. Therefore, presentations at Austrian events targeted at the logistics community are analyzed with a deductive content analysis. The systematic analysis is based on a framework, which considers business, technology, people and ecology as major dimensions and includes important key topics of innovation.

Results confirm that the mega-trend digitalization is in the center of attention. While the dimensions technology and business dominate the agendas of logistics events, people- and ecology-oriented topics play a rather subordinate role. The presented approach offers indicators which can be used to focus on a selection of innovations. This can help managers and researchers to reduce complexity within the vibrant field of logistics-related innovations. Results also should be of particular interest to teachers in logistics to define future-oriented curricula based on the estimated potential innovations will have in the future.

Keywords: logistics innovations, supply chain innovations, Industry 4.0, trend research, content analysis

WHY YOUR PRODUCT VARIETY MANAGEMENT STRATEGYMAY FAIL: BARRIERS IN THE REDUCTION OF THE PRODUCT VARIETY

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ABSTRACT

Product variety management is a multi-faceted field built on the contributions from the marketing, economics, and operations management domains. Product Variety can be introduced for strategic purpose or for increasing the market share. However, with the increasing variety may also come increasing costs and customer confusion due to difficulty in distinguishing products from one another. Many CEO's would like to reduce product variety, but fail to implement it in their organization or meet difficulties in implementing the reduction of product variety in the pace and to the degree they would prefer. The aim of this paper is to identify the most important challenges in the implementation of a portfolio simplification strategy, analyzing the barriers found in the literature and, based on a case study, identifying new barriers not yet described in literature. Product Variety Management and SKU rationalization are highly researched subjects both from an academic and a practitioner vantage point. Different case studies and research project studied the impact of an assortment reduction. Nevertheless, a collection of the main barrier in the implementation of a product variety management strategy is not present in the academic literature. We found that the main barriers are not only related to the business and organizational contest, but they are deeply affected by the culture and the personality of the people involved in the implementation of the SKU rationalization strategy. The contribution of this project is a list of barriers that can be used: by managers as a guide for implementing a SKU rationalization; such an overview would reveal where the management should focus attention and resources in order to overcome skepticism and even resistance in the implementation of the strategy. By researcher as an indication of which aspects should be considered more in the further research on SKU reduction. The case study provided additional barriers not considered in the literature.

Keywords: SKU Rationalization, Barriers, Product Variety Management, Complexity Management.

NEGOTIATING THE MULTI-NATIONAL SUSTAINABLE FOOD SUPPLY CHAIN: A CONCEPTUAL ROADMAP

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ABSTRACT

As global wealth and prosperity shifts, Food Chief Supply Chain Officers (CSCO) and Chief Sustainability officers (CSO) must become even closer global partners in order to survive. For instance, according the World Health Organization (WHO) estimated that at least three million lives are lost annually due to carbon emission. Several known sources including utility plants, organic food matter, and other industrial supply chain (combustion engines) sources. This life expectancy number creates a sense of urgency for growing multi-national food companies (MNFCs). The implications are clear, failure to develop and implement effective supply chain CO 2 strategies in the Paris Climate Agreement and China Carbon Trading era could lead to further humans, animals, and businesses losses. In contrast, MNFCs must grow in developing markets or face a difficult future.

This research study offers an innovative MNFC sustainable supply roadmap and technology innovations to address future sales growth and lower greenhouse gas emissions. First, this paper engages leading international subject matter experts (SME) whom influence the world's largest multi-national food companies. The paper's SME's provide a high-level Food MNCs Supply Chain roadmap. Second, this paper reveals emerging MNFC technologies which could help fill two (new product development and strategic sourcing) of six global food sustainable supply chain research gaps suggested by this research paper's SME's. MNFC gaps such as blockchain, machine learning and internet of things (IoT) are integrated into this paper's findings and MNFC sustainable supply chain conceptual roadmap. Although this paper is narrowly focused on the global food exporters yet many aspects of this paper apply to many global consumer products companies. Collectively this paper could to useful to researchers, government and industry leaders.

Keywords: Sustainable Supply Chain, Food Supply Chain, Block Chain, Machine Learning, Internet of Things (IoT), Smart Contracts

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