



# The 32<sup>nd</sup> ANNUAL NOFOMA CONFERENCE 17 – 18 September on Internet

# **BOOK OF ABSTRACTS**

HOSTED BY:



WITH SUPPORT FROM THE NOFOMA BOARD

# Foreword

The 32<sup>nd</sup> NOFOMA annual conference was originally planned and organized by University of Iceland and should have taken place early June this year with scholars from the Faculty of Industrial Engineering, Mechanical Engineering and Computer Science. As the COVID-19 outburst became our awkward reality and events similar to this one were postponed one by one, similar destiny became ours as well; first by postponing until late August or early September, but in the end unfortunately bringing us here, or actually not bringing us physically nowhere elsewhere than behind the screen and in front of the camera, as has been our habitation for more than six months now.

Given this reality, the NOFOMA Board decided to take over the organization of the conference as the 2021 conference is now planned for Iceland. To free the Faculty of Industrial Engineering, Mechanical Engineering and Computer Science of doing majority of the work two times in a row, the NOFOMA Board has assisted in preparing the conference this time. The review process was still carried out by University of Iceland as it was already halfway when the decision was taken.

The theme of the conference was from the early start **"Operational excellence through logistics resilience"**. It was chosen due to the fact that Iceland came into the spotlight little less than ten years ago as the volcano Eyjafjallajökull made it latest outburst resulting in a serious problem in transportation and logistics operations in Europe and in the end affected the whole worlds' supply chains. The irony of the whole situation is this year outburst of COVID-19 has brought on the society similar logistical problems in addition to the horrifying health problems and losses of lives that where luckily not of any serious concern during the volcano erection. Logistics operations are a key importance in such times and can bring the support needed for the society through humanitarian work but also with better knowledge in the field of logistics to provide support and secure supplies to industries and the citizens that rely on logistics operations to continue as needed despite serious occurrences.

There was a great interest for this year's NOFOMA conference. Initially, 120 abstracts were submitted for the conference. At the deadline for revised full papers and work-in-progress papers 60 full papers have been accepted for the conference proceeding but, due to the format of the conference, much less work-in-progress papers to be presented at the conference. All full papers have undergone a double-blind review process by using around 70 reviewers.

#### **Doctoral Day**

A doctoral day was prepared as usually and this time with the theme "Logistics methodologies - a smorgasbord with alternatives". It was prepared by several of our colleagues; Dr. Violeta Roso from Chalmers University of Technology, Dr. Dawn Russell and Dr. Dag Näslund, both professors at University of North Florida. Again, due to the COVID-19 outburst it was clear that the ambitious programme they had prepared needed to be postponed. We give our thanks to these good colleagues and will bring to you their excellent preparation next year, 2021.

#### **Educators Session**

In the NOFOMA Business meeting last year in Oslo, a decision was taken to include the previous Educators Day into the conference and make it a whole two days or even two and a half day long conference. This year, this decision was respected, and the first half day of the conference was planned for an Educators session. Originally, a decision taken on the theme in Desember last year was "Digitalization of teaching", again, spot on for today's situation on COVID-19. However, such an extensive programme was not achievable and was downscaled to a very contemporary issue of "Education during pandemic times". Two experienced academics had the responsibility for developing the session, Dr. Per-Olof Arnäs and Lic. Eng Ola Hultkrantz, both from Chalmers Univerity of technology. Mr. Hultkrantz, head of the MSc. Programme in Industrial Engineering and Management, at Chalmers will during the session give insight into this very valid issue and moderate discussion on the topic. Thank you for your efforts.

#### **Keynote Speech**

Dr. Martin Christopher will give a keynote speech with the title "*Building Resilient Supply Chains in the post-Covid19 World*" on Thursday morning. Dr Christopher is known by most of us for his work on Supply Chain Management and not the least resilience and agility; the theme for the conference this year. We are very grateful for his engagement.

#### **Publications**

International Journal of Physical Distribution & Logistics Management (IJPD&LM) continue its collaboration with NOFOMA by publishing a special issue of the best papers from the conference. After the conference, some papers will be invited for a further process to improve their theoretical and practical relevance. Special thanks go to the editorial team of IJPD&LM for the continued support.

#### **Programme and sessions**

The Programme and Sessions programme can be found in this book but also on the NOFOMA home page nofoma.net that has been updated for this year's conference. There you can as well find a link to the Zoom meetings and Webinars. All sessions A have the same link as do sessions B, hence, if you are to attend more than one session, A or B in a sequence, you can stay on the line.

All presentations will be around 8 minutes long and give you highlights of the paper by using slide shows. Either direct after each presentation or after two or more the Session chair will open up for questions that participants can ask directly, i.e. the sessions will invite all of you to take part and in a NOFOMA spirit and give feedback to the authors verbally "on-site". For that purpose you only need to unmute yourself and open for video if you want; hence, the sessions are executed as meetings and not a webinars. The only webinar is the keynote speech given by Dr. Martin Christopher on Thursday morning but even during that presentation, you are welcome to post questions through the Q&A function.

One of our milestones have been the gala dinner after the first day of the conference that is obviously not achievable now. However, to compensate somewhat for that, we will arrange an open Zoom session in end of the first day to give participants possibility to "mingle" in virtual world and exchange some ideas and thoughts.

Hope you will enjoy the conference and please take part in the discussions, that is one of the key factors in strengthening our research society.

Cheers, Dr. Gunnar Stefansson Conference Chair, NOFOMA 2020.

#### **Scientific Committee**

Dr. Gunnar Stefansson (Chair and contact person), University of Iceland, Iceland Dr. Gyöngyi Kovács, Hanken, Finland Dr. Heidi C. Dreyer, NTNU, Norway Dr. Henrik Pålsson, Lund University, Sweden Dr. Jan Stentoft, University of Southern Denmark, Denmark

#### "Local" Organisational Committee

Dr. Gunnar Stefansson, Professor, University of Iceland, Iceland Mr. Majid Eskafi, Ph.D. candidate, University of Iceland, Iceland

# Programme:

		NOFOMA 2020 Programme	
17/09	Sessions:	Sessions leaders	Topics:
08.45-	S0	Dr. Gunnar Stefansson	Opening
09:00	00	(aunste@hi.is)	oponing
09:00-	S1A	Dr. Henrik Pålsson	Sustainability 1
10:00	_	(henrik.palsson@plog.lth.se)	
09:00-	S1B	Dr. Gyöngyi Kovács	Humanitarian 1
10:00		(gyongyi.kovacs@hanken.fi)	
10:00-	S2A	Dr. Heidi C. Dreyer	Third party services
11:00		(heidi.c.dreyer@ntnu.no)	
10:00-	S2B	Dr. Jan Stentoft	SOP/Production
11:00		(stentoft@sam.sdu.dk)	
11:00-	S3:	Dr. Martin Christopher	Keynote "Building
12:00	Keynote	Emeritus Professor of Marketing &	Resilient Supply
		Logistics,	Chains in the post-
		Cranfield University LIK	Covia 19 vvoria
12.00	S11		Supply Chain
11.00-	34A	DI. Jah Stehton (stentoft@sam.sdu.dk)	Management
14.00		(stentott@sam.sdu.dk) Management	
13:00-	S4B	Dr. Ole S. Mikkelsen	Collaboration 1
14:00	0.12	(osm@sam.sdu.dk)	
14:00-	S5A	Dr. Jan Stentoft	Procurement
15:00		(stentoft@sam.sdu.dk)	
14:00-	S5B	Dr. Henrik Pålsson	Transportation
15:00		(henrik.palsson@plog.lth.se)	-
15:00-		Ola Hultkrantz, Lic. Eng.	"Education during
16:00		Head of Programme MSc in Industrial	pandemic times –
		Engineering and Management and Lecturer,	how did the
		Technology Management and Economics,	Universities
		Chalmers University of Technology,	respond?"
16.00		Goteborg, Sweden	Onen Zeere After
10:00-		All	Open Zoom Aller
17.00			work – Roundup
18/09:	Sessions:	Sessions leaders:	Topics:
09:00-	S7A	Dr. Heidi C. Drever	ICT 1
10:00	_	(heidi.c.dreyer@ntnu.no)	
09:00-	S7B	Dr. Gyöngyi Kovács	Collaboration 1
10:00		(gyongyi.kovacs@hanken.fi)	
10:00-	S8A	Dr. Heidi C. Dreyer ICT 2	
11:00		(heidi.c.dreyer@ntnu.no)	
11:00-	S9A	Dr. Henrik Pålsson Sustainability 2	
12:00		(henrik.palsson@plog.lth.se)	
12:00-	S10	Gunnar Stefansson	Closing of NOFOMA
12:15		(gunste@hi.is)	2020

NOFOMA 2020 Session programme			
DAY 1	Sessions/papers:	Sessions leaders/Authors:	Topics/Title:
08:45-09:00	<b>SO</b>	Dr. Gunnar Stefansson	Opening
09:00-10:00	S1A	Dr. Henrik Pålsson	Sustainability 1
	27	Markus Pöllänen, Timo Liljamo, Erika	Attitudes of Finnish road haulage companies
		Kallionpaa and Heikki Liimatainen	towards environmental goals and measures
	33	Florian Hofbauer and Lisa-Maria Putz	External costs of inland waterway transport
	71	Oskari Rintala, Sini Laari, Tomi Solakivi	A Value-based view of environmental behavior
		and Juuso Töyli	and financial performance
	16	Robin von Haartman and Amer Jazairy	Analysing the trade-off between lower
			emissions and cost efficiency in logistics:
	0.15		Results from a Swedish large-scale survey
09:00-10:00	S1B	Dr. Gyöngyi Kovács	Humanitarian 1
	5	Mohammad Moshtari, Nezih Altay, Paulo Gonçalves and Jussi Heikkilä	Procurement in humanitarian organizations
	30	Diego Vega, Christine Roussat and	Logistics service providers in humanitarian relief -
		Gyöngyi Kovács	New kids on the block
	58	Virva Tuomala	Urban food security and distribution networks in
	103	Qifeng Yan, Minchul Sohn and	Lead Time in Humanitarian Logistics
		Gyöngyi Kovács	Preparedness Decisions Based on Climate
	2	Paul Larson, David Grant and Ruth	Human Migration and Social Innovation:
		Banomyong	Perspectives across Several Nations
10:00-11:00	S2A	Dr. Heidi C. Dreyer	Third party services
	15	Ebba Eriksson	Online fulfilment centers in grocery retail: An
			exploration and categorization of challenges
	22	Christine Roussat, Valentina Carbone	Consumer to consumer supply chains: Lessons
		and Aurélien Rouquet	from a stylish case
	96	Raphael Preindl	Choice and Customization of Urban Logistics
			concepts Towards a conceptual framework for
	17	Benedikte Borgström and Helgi-Valur	How come logistics operators' ROI are so low
		Fridriksson	despite warehouse operations are very cost
			efficient? A business model reconsideration of
			logistics facilities
10:00-11:00	S2B	Dr. Jan Stentoft	SOP/Production
	8	Jan Stentoft, Ole Stegmann Mikkelsen	The relationship between behavior, process
		and Per Vagn Freytag	efficiency and performance in Sales &
			Operations Planning
	101	Joakim Andersson, Patrik Jonsson and Hafez Shurrab	Sales and operations execution: An exploratory study on potential effects
	50	Samu Rautio and Timo Tuomi	Legal aspects of additive manufacturing in the
			military logistics
	70	Hafez Shurrab and Patrik Jonsson	Exploring factors causing and amplifying
			delivery schedule instability: An OEM
			perspective from the automotive industryRY
11:00-12:00	\$3	Dr. Martin Christopher	Key note "Building Resilient Supply Chains in the
		Emeritus Professor of Marketing &	post-Covid19 world"
		Cranfield School of Management	
		Cranfield University LIK	

13:00-14:00	S4A	Dr. Jan Stentoft	Supply Chain Management
	46	Xiaobei Wang and Kulanart Kongruthaichai	The impacts of the belt and road initative on international reverse logistics
	85	Nathalie Silva and Henrik Pålsson	Strategies for Industrial Packaging Selection: a Systematic Literature Review
	78	Hafdís Jónsdóttir, Kristina Liljestrand,	Measuring and sharing data on KPIs for
		Jessica Wehner, Joakim Kalantari and Patricia van Loon	transport efficiency: An interview study of shippers and transport providers
	128	Marisol Rico Cortez, Elvira Kaneberg Ruiz, Rosa Gonzalez Huerta and Juan Manuel Sandoval Pineda	Supply chain management for sustainable packaging and distribution using oxyhydrogen reactors in Mexico
	77	Janne Huiskonen and Pekka Pellikka	Spare parts global distribution network analysis
13:00-14:00	S4B	Dr. Ole S. Mikkelsen	Collaboration 1
	86	Pasi Rintamaa, Jussi Heikkilä and Aki Jääskeläinen	Buying new digital service solutions - A customer perspective to co-creation
	109	Stanley Fawcett, Amydee Fawcett, Scott Webb, Sebastian Brockhaus and Michael Knemeyer	Relational evolution: Commitment as a super- ordinate enabler of value creation
	68	Aki Jääskeläinen, Katrina Lintukangas and Jussi Heikkilä	Antecedents of Preferred Customer Status in Manufacturing and Service Businesses
	111	Markus Gershberger, Stanley Fawcett, Melanie Hinterplattner and Amydee Fawcett	Supply Chain Complexity: The Uneasy Fact of Life that Is the Key to Customer Satisfaction
14:00-15:00	S5A	Dr. Jan Stentoft	Procurement
	7	Ala Pazirandeh Arvidsson and Lisa Melander	Organizing for the of purchasing of innovation Insight from two auto manufacturers
	60	Tuomas Kiiski, Sini Laari and Harri Lorentz	Decade of purchasing and supply management in Finnish annual reports: Topic modelling of top management attention
	79	Logan Vallandingham, Luitzen De Boer and Heidi Dreyer	Care pathways and hospital material logistics: Exploring the connection, opportunities and challenges
	104	Panagiota Tsaxiri and Helene Lidestam	The meaning of policy documents in bus transport services
14:00-15:00	S5B	Dr. Henrik Pålsson	Transportation
	10	Mikael Kervall and Henrik Pålsson	Barriers to fossil-free urban goods transport systems - An explorative study of a Nordic city
	14	Vendela Santén, Sara Rogerson, Jon Williamsson and Johan Woxenius	The modal shift process - Ways to achieve an increased use of inland waterway transport
	44	Majid Eskafi, Ali Dastgheib, Poonam Taneja, Gudmundur F. Ulfarsson, Gunnar Stefansson	Flexibility in port logistics by adaptive port planning, a case study of the Ports of Isafjordur Network in Iceland
	62	Ayman Nagi, Meike Schroeder and Wolfgang Kersten	A Community Detection of Stakeholders in Risk Management at the Port of Hamburg
	57	Erika Kallionpää, Timo Liljamo, Markus Pöllänen, Jukka Pellinen and Heikki Liimatainen	Developing sustainable city logistics by implementing electric freight trucks
15:00-16:00	S6	Ola Hultkrantz, Lic. Eng.	"Education during pandemic times - how did the
	Educators Session	Head of Programme MSc in Industrial Engineering and Management and Lecturer, Technology Management and Economics, Chalmers University of Technology,	Universities respond?"
16:00-17:00		Goteborg, Sweden All	Zoom After work - Round-up with the NOFOMA

DAY 2		Sessions leaders:	Topics:
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			management - Influencing factors and success
		Stefan Selensky and Erik Hofmann	practices
	65		Using GPS data to map freight vehicle
		Christian S. Mjøsund and Inger Beate	movements in urban areas: logging in-vehicle
		Hovi	data from 1600 Norwegian vehicles
	74		Attentional drivers of technology search -
			Examining the search behavior of large and
		Mathias Mathauer	small logistics service providers
	130		Fostering the integration of Inland Waterway
		Nils Meyer-Larsen and Patrick Specht	Transport in intermodal logistics chains
09:00-10:00	S7B	Dr. Gyöngyi Kovács	Collaboration 2
	11		collaboration between retailers and logistics
		Linnea Haag	service providers
	28		Interaction for successful Implementation of
		Niklas Simm and Maria Björklund	Climate Smart Freight Technology
	113		Alignment in return management integration
		Stefan Karlsson, Daniel Hellström, Pejva	process, policy and business intent
10:00-11:00	S8A	Dr. Heidi C. Dreyer	ICT 2
	6	Mikael Öhman, Ala Pazirandeh	
		Arvidsson, Patrik Jonsson and Riikka	Developing the analytics in purchasing and
		Каіріа	supply management
	99	Emmelie Gustafsson, Patrik Jonsson	Retail supply chain effects of digital product
		and Jan Holmström	fitting on product returns
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			success factors – A study of the current state in
		Tobias Held and Lukas Schneider	German-speaking companies
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		Anders Henrik Ringsberg	pharmaceuticals
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	118	Bente Flygansvær, Asta Gjetø	The power of nudging: How reverse logistics can
		Samuelsen and Rebecka Våge Støyle	contribute to improve recycling rates
		Anna Zhuravleva and Anna Aminoff	An emerging partnership betwqeen non-profit
	49		organizations and companies in reverse supply
			chains: Enabling the valorisation of post-use
		Sayed Mohammad Ayati, Jonas	A decision model for re-engaging End-of-Life
	120	Nygaard, Jesper Hemdrup Kristensen	products into the forward supply chain
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111	Markus Gershberger, Stanley Fawcett, Melanie Hinterplattner and Amydee Fawcett	Supply Chain Complexity: The Uneasy Fact of Life that Is the Key to Customer Satisfaction
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120	Sayed Mohammad Ayati, Jonas Nygaard, Jesper Hemdrup Kristensen and Brian Vejrum Wæhrens	A decision model for re-engaging End-of-Life products into the forward supply chain
128	Marisol Rico Cortez, Elvira Kaneberg Ruiz, Rosa Gonzalez Huerta and Juan Manuel Sandoval Pineda	SUPPLY CHAIN MANAGEMENT FOR SUSTAINABLE PACKAGING AND DISTRIBUTION Using Oxyhydrogen reactors in Mexico
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# HUMAN MIGRATION AND SOCIAL INNOVATION PERSPECTIVES ACROSS SEVERAL NATIONS

#### Paul D. Larson \* David B. Grant \* \* Ruth Banomyong \* \* \*

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- \*\*\* Thammasat Business School, Logistics, Bangkok, Thailand, ruth@tbs.tu.ac.th.

### ABSTRACT

#### Purpose

The purpose of this paper is to study human migration from a social innovation point of view. Social innovation involves creating and implementing new solutions to social and/or environmental challenges – and to make a positive difference. The paper includes a look at the transportation of migrants, with special reference to smuggling and human trafficking.

#### Design/methodology/approach

The method is primarily case-based, with the nation (Canada, Iceland and Thailand) as unit of analysis. Cross-cutting themes include logistics, social sustainability and legal vs. illegal supply chains. Sources of evidence include published reports, news items and web-sites.

#### Findings

Identification and description of social innovations that address migration issues highlight the findings. Differences across nations and continents (Asia, Europe and North America) are explained in terms of culture, geography and politics. Social innovations and logistics differ widely when moving from "regular" migration to smuggling to human trafficking.

#### **Research limitations/implications**

The study is limited to three destination countries. Destination characteristics imply unique migrant needs, migration routes and nations of origin. The findings must be cautiously generalized beyond the small sample of nations. The paper includes a research agenda.

#### **Practical implications**

Among the implications are practical suggestions for collaboration among various stakeholders and entities working with migrants or impacted by flows of migrants. Particular innovations are matched with specific destinations and routes.

#### Social implications (if applicable)

Migration has implications for the UN Sustainable Development Goals (SDGs), which inspire public policy recommendations. Ideally, migration is a positive experience for all stakeholders, including migrants, those left behind, and destination country communities. This implies a need to disrupt human trafficking supply chains; and make the logistics of smuggling safer. The paper includes a discussion of COVID-19 implications for migration.

#### Original/value

This appears to be unique as a study linking social innovation, logistics and migration.

Keywords: Migration, Social Innovation, Sustainability, Logistics, Smuggling

# **Procurement in Humanitarian Operations**

#### Mohammad Moshtari Nezih Altay Paulo Gonçalves Jussi Heikkilä

## ABSTRACT

#### Purpose

This paper reviews scholarly articles related to procurement in the context of humanitarian organizations and analyzes them from multiple angles.

#### Design/methodology/approach

We review empirical and modeling peer-reviewed research papers on humanitarian procurement.

#### Findings

We conducted our search using three bibliographical databases: ABI/INFORM ProQuest, Web of Science, and Scopus. From a total of 310 studies, 48 highly relevant papers offer empirical insights or decision-making tools for procurement management in the context of humanitarian operations. We mapped them out in respect to procurement tasks such as defining specifications/assessing needs, spend analysis, souring Strategy, supplier search, screening and selection, contract design.

#### **Original/value**

This paper contributes to the humanitarian logistics literature by providing insight into which tasks or activities in the procurement process have been the focus of research.

Keywords: Procurement, Humanitarian logistics, Literature review.

# DEVELOPING THE ANALYTICS CAPABILITY IN PURCHASING AND SUPPLY MANAGEMENT

Mikael Öhman Ala Pazirandeh Arvidsson Patrik Jonsson Riikka Kaipia

## ABSTRACT

#### Purpose

This study aims to explore how firms develop their analytics capability to leverage data in their purchasing and supply management (PSM) decisions

#### Design/methodology/approach

An exploratory multiple case study is conducted with 6 case companies, collecting primary data through interviews. Cases were chosen based on them having advanced PSM practices and ongoing analytics projects in the procurement area. We used Dynamic Capabilities (DC) as our theoretical lens, to investigate how the cases developed their analytics capability for leveraging data in the PSM area.

#### Findings

The findings shed light on how the firms develop their analytics capability in PSM. While we identify several common practices in how the firms develop their analytics capability, we also observed differences in how firms organize for analytics and bring analytics to PSM decision makers. In an effort to explain the observed differences, we put forth three different development trajectories taken by our more advanced cases, after the initial introduction of analytics in the procurement organization

#### Research limitations/implications (if applicable)

The exploratory nature of our study delimits the generalizability of our results. Further, our limited number of cases and interviewees indicate that there is still much to explore in the phenomenon of developing analytics capability.

#### Practical implications (if applicable)

Our findings can help firms gain a better understanding of how they could develop their analytics capability, and what issues they need to consider when seeking to leverage data through analytics for PSM decisions.

#### **Original/value**

This paper is, to the best knowledge of the authors, the first empirical study of the analytics capability in PSM.

*Keywords: Procurement, Data analytics, Analytics capability, Purchasing and supply management* 

# ORGANIZING FOR THE PURCHASING OF INNOVATION

#### Insights from two auto manufacturers

#### Ala Pazirandeh Arvidsson Lisa Melander

### ABSTRACT

#### Purpose

We aim to increase the understanding of how companies organize their purchasing of high technology in the light of conflicting drivers for purchasing of such innovation compared to matured technology (e.g. costs versus capabilities or risk). Supplier selection is affected by the constant need of firms to stay updated with, and integrate, new technology. As a result of such pressure, firms are facing the entrance of new suppliers, such as startups, innovation hubs, incubators, or companies from other sectors into their supply base. These new suppliers, at times, have little to no knowledge of the buyer's industry, which poses challenges to the purchasing function, which in turns has limited knowledge of the new industries.

#### Design/methodology/approach

We conduct qualitative in-depth studies of two cases of purchasing of high technology in two different auto manufacturing companies by interviewing the buying side at the firms and the supply side of the technologies.

#### Findings

Our observations show two different approaches to organizing purchasing of high technology as a response to the conflicting needs of purchasing innovation compared to matured technologies in these industries: 1) higher levels of cross-functional sourcing with a larger role for the engineering function, and 2) a sourcing group for innovation in parallel to the existing ones. Both organizations were developed in response to similar challenges that the existing established processes were not apt to respond to.

#### **Research limitations/implications**

The findings are limited to borders of the industry and the two case studies.

#### **Practical implications**

Our findings show firms the possibilities of how to organize their purchasing of high technology to deal with the challenges and complexities compared to their existing processes.

#### Original/value

The paper connects to the ongoing conversation among supply chain researchers on the challenges attached to purchasing of innovation with high levels of environmental uncertainty.

Keywords:

Supplier selection, Purchasing of innovation, Automobile industry, Technological uncertainty.

# THE RELATIONSHIP BETWEEN BEHAVIOR, PROCESS EFFICIENCY AND PERFORMANCE IN SALES & OPERATIONS PLANNING

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#### ABSTRACT

#### Purpose

The purpose of this paper is to analyze the relationship between key behavioral indicators (KBIs), Sales and Operations Planning (S&OP) efficiency and perceived firm performance (in terms of sales, cost and finance) as well as secondary performance indicators. KBIs and S&OP efficiency are novel concepts that still need operationalization and thus call for an explorative approach.

#### Design/methodology/approach

The paper is based on a questionnaire-survey among Danish manufacturers that have an S&OP process in operation. The survey consists of multiple respondents from each company covering sales, operations, finance, and the S&OP process manager.

#### Findings

Data reveals that there is a positive relationship between KBIs and S&OP efficiency among the respondents. Furthermore, data indicate that process efficiency is positively related to sales and operational performance. The results also reveal that firm-size controls the relationships between process efficiency and operational performance.

#### **Research limitations/implications (if applicable)**

Including behavioral aspects in an S&OP context is still nascent, thus requiring further development of constructs. The present study is limited to a data set relying on full answers from four persons in 50 companies. A next valuable step can be to further explore the constructs with a larger data set.

#### Practical implications (if applicable)

The results indicate that it does pay off to focus on soft issues (in terms of behavior and process efficiency) in S&OP processes to enhance sales and operational performance.

#### **Original/value**

The paper provides novelty in terms of including multiple respondents covering the S&OP process of the individual firm to obtain a broader, more robust and balanced foundation for analysis. Furthermore, the paper provides novelty by linking behavioral aspects to process efficiency.

*Keywords: Questionnaire-survey, key behavioral indicators, S&OP efficiency, firm-size, performance* 

# Barriers to fossil-free urban goods transport systems

### An explorative study of a Nordic city

#### Mikael Kervall Henrik Pålsson

### ABSTRACT

#### Purpose

The purpose is to identify, categorise and describe barriers for a fossil-free transport system for urban goods.

#### Design/methodology/approach

The barriers are studied from a systems perspective in a case of a mid-sized Nordic city. Data are collected from 15 semi-structured interviews with officials from the city and representatives of private companies, and from policy documents and a workshop. To categorise barriers, the analysis is inspired by grounded theory.

#### Findings

The study identifies nine themes of barriers to a fossil-fuel free transformation and characterize them, their sub-categories and the linkages between the categories.

#### **Research limitations/implications**

The research focuses on stakeholders in one Nordic city. Future research should study urban transport systems in other cities and contexts.

#### **Practical implications**

The study points at several barriers to a fossil fuel free transformation of the urban goods transport system. Overview as well as insight about the barriers can help stakeholders to address barriers and support a transformation.

#### **Social implications**

Insightful strategies for change increase the chances for a successful transition to a fossilfuel free goods transport system, which will contribute to the fulfilment of societal goals.

#### **Original/value**

The identification, categorisation and description of themes of barriers, and their linkages in this explorative study is an initial step to understand the transformation to a fossil fuel free urban goods transport system from system perspective.

Keywords: Barriers, City logistics, Fossil-free, Freight, Stakeholders, Transformation, Urban transport, Goods.

# DYNAMIC SUPPLY CHAIN CAPABILITIES SUPPORTING COLLABORATION BETWEEN RETAILERS AND LOGISTICS SERVICE PROVIDERS

#### Linnea Haag\*

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## ABSTRACT

#### Purpose

The purpose is to explore dynamic supply chain capabilities (DSCCs) needed in retailerlogistics service provider (LSP) collaboration, which is aimed at improving the logistics system.

#### Design/methodology/approach

Literature reviews and a multiple case study approach were used. More specifically, literature on DSCCs were combined with empirical data from four retailer-LSP dyads.

#### Findings

This study refines key DSCCs and antecedents of DSCCs needed in retailer-LSP collaboration in order to jointly improve logistics.

#### **Research limitations/implications**

The study rests on a few case companies in a specific supply-chain setting of retailer-LSP dyads. Therefore, more empirical research on DSCCs are requested.

#### **Practical implications**

The study provides an improved understanding of DSCCs that can motivate managers to engage in collaborative retailer-LSP relationships, as well as to help managers to recognise key characteristics of DSCCs that can support the improvement of the logistics system.

#### Originality/value

Key characteristics of DSCCs are explored and summarised in order to improve the understanding of DSCCs that support retailer-LSP collaborations, which aims to improve the logistics system.

Keywords: dynamic supply chain capabilities, logistics system, retailers, logistics service providers, case study

# MODAL SHIFT PROCESS WAYS TO ACHIEVE AN INCREASED USE OF INLAND WATER-WAY TRANSPORT

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## ABSTRACT

#### Purpose

Although a modal shift from road to water is a prioritised strategy outlined on member state and European Union levels, inland waterways are underutilised in large parts of the EU, while other areas face a challenge of competing with attractive road solutions. Thereby, there is a large potential in developing tools facilitating an increased usage of inland waterway transport. The purpose is to identify and structure key activities by various actors to realise modal shift to inland waterways.

#### Design/methodology/approach

A multiple case study approach was applied, including five cases in the North Sea Region. To capture key activities, workshops, interviews and field observations were conducted.

#### Findings

Activities to realise a modal shift was categorised according to four principal and two integrated cross-cutting themes. The process varies between actors and cases in terms of order, level of parallel tasks, number of iterations etc. Different actors can have a leading role in the modal shift process. Realisation of large-scale modal shift requires multi-actor engagement, openness for emergent solutions as well as long-term endurance.

#### Research limitations/implications (if applicable)

Further research could include examples outside the North Sea region.

#### Practical implications (if applicable)

Both industrial actors and governmental organisations can apply the outlined activities. The principal and integrated themes are important to consider, and the activities described can be used as a toolbox, applicable depending on prerequisites in different situations.

#### **Original/value**

Earlier studies have described various barriers for a modal shift to inland waterway transport. This paper focuses on activities to realise a modal shift. A conceptual model is proposed, drawing from practice in five countries.

Keywords: Activities, Actor collaboration, Inland waterway transport, Modal shift, Process.

# Online fulfilment centers in grocery retail: An exploration and categorization of challenges

#### Ebba Eriksson\*

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### ABSTRACT

#### Purpose

The purpose is explore and categorize challenges that grocery retailers are facing in the implementation of an OFC and understand why they emerge

#### Methodology

A literature review created the foundation for a multiple case study. An exploratory case study with four grocery retailers was conducted. The case analysis was carried out in three steps; i) within-case analysis, ii) cross-case analysis, and iii) synthesis of findings.

#### Findings

13 challenges were identified divided in to five categories were identified. The study expands existing research by moving beyond challenges connected to picking in an OFC. The drivers behind, as well as the implications for the OFC, were discussed. It is clear that while several of the drivers identified can be found externally to the OFCs, they still carry implications for the OFC configuration. Thus, it is important for the retailer to understand the external changes that the omni-channel transformation entails.

#### **Research limitations/implications**

The main limitations are related to data collection, specifically the use of only four cases from three similar markets. This should be addressed through additional data collection in future studies.

The focus on aspects of OFC configurations in omni-channel grocery retail responds to recent calls for more research on omni-channel warehousing, especially in grocery retails, and extends current knowledge.

#### **Practical implications**

This paper provides empirical data on how four OFCs are configured to handle common challenges. This data can provide valuable insight for practitioners.

#### Original/value

Although OFCs have been reality in practice for over a decade, extant research on their challenges is still limited. This paper provides a first effort to empirically explore the challenges of grocery-retail OFCs.

Keywords: Omni-channel, grocery retail, online fulfilment centers, warehousing

# Online fulfilment centers in grocery retail: An exploration and categorization of challenges

#### Ebba Eriksson\*

\* Lund University, Department of Industrial Management and Logistics, , SE-22100 Lund, Sweden, <u>ebba.eriksson@tlog.lth.se</u>

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Keywords: Omni-channel, grocery retail, online fulfilment centers, warehousing

# Analysing the trade-off between lower emissions and cost efficiency in logistics

Results from a Swedish large-scale survey

#### Robin von Haartman Amer Jazairy

## ABSTRACT

#### Purpose

Greenhouse gases, such as CO<sub>2</sub>, are heating up the planet and causing sea levels to rise, and the logistics industry, although vital for contemporary society, it is also a main contributor to the problem. Shippers and logistics service providers (LSPs=) can reduce their emissions by implementing green logistics practices, but these actors also need keep a close eye on costs. The purpose of this paper is to analyse the impact of different green logistics practices on logistics emissions and cost efficiency.

#### Design/methodology/approach

The paper is based on survey, with responses from 169 shippers and 162 LSPs in Sweden. Commonly used methods such as correlation-, principal component- and multiple regression analyses have been employed.

#### Findings

The findings reveal that some types of green logistics practices are strongly associated with reduced emissions, whereas others have less of an impact. Moreover, the results provide no evidence of a trade-off situation, i.e. a situation where green logistics practices would reduce emission while increasing costs.

#### Research limitations/implications (if applicable)

This paper contributes to the discussion on green logistics practices, and particularly on whether going green is costing more. This paper is based on self-reported emissions and cost-efficiency. It is recommended that future studies look at real emission data that may be available from companies' annual reports.

#### Practical and Social implications (if applicable)

The findings provide insights to practitioners and policymakers who are seeking to reduce emissions from logistics. While it may be too optimistic to assume that cost efficiency will improve while becoming greener, there seems to be economic down-side to investing in green practices either.

#### **Original/value**

Research is thus needed to simultaneously assess the relative impact of different green logistics practices on both emissions and on cost efficiency in logistics. This paper aims to fill this gap.

Keywords: green logistics, environmental sustainability, logistics buyers, LSPs

# ENHANCED CIRCULARITY IN AFTERMARKETS REQUIREMENTS AND TRADEOFFS ON LOGISTICS SERVICES

#### Gabriella Gatenholm Árni Halldórsson Jenny Bäckstrand

# ABSTRACT

#### Purpose

The purpose of this paper is to identify requirements and tradeoffs on logistics services in order to enhance circularity of materials and resources.

#### Design/methodology/approach

Based on multiple case study design with abductive reasoning, the study investigates thirteen different product categories. The data was analyzed based on theoretical, a priori codes from the literature review. Inductive, emerging codes, were added to the coding scheme during the analysis.

#### Findings

Requirements of logistics services to support slowing of resource flows are categorized with respect to provider driven or co-created services, the location of the service; single or multiple actors; transportation of parts, products and people. Moreover, the study elaborates upon tradeoffs in aftermarket supply chains and logistics requirements to support slowing of resources flows. Most significant are the tradeoffs between knowledge and people; and information and parts and product. Practitioners should minimize transportation of product, people and parts by increasing local knowledge and improve information sharing.

#### **Research limitations/implications**

This study is based on manufacturing companies providing aftermarket services; repair & maintenance, reuse & redistribution, and/or refurbishing & remanufacturing. The study takes a dyadic perspective including the provider and the customer. To enhance circularity, logistics services must extend the traditional material-information flow with flow of people and knowledge, respectively

#### **Practical and Social implications**

The categorization provides practitioners and reesearchers with an overview of requirements and tradeoffs on logistics services to enhance circularity at a particular level in the waste hierarchy. The implications will both provide opportunity to address environmental impact of transportation as well as improve utilization of scarce materials.

#### Original/value

This review contributes to the understanding of the relationship between logistics services and enhancement of circularity by highlighting requirements on logistics services in the aftermarket supply chain as well as recommendations for the future.

Keywords: Logistics services, aftermarket services, circularity, circular economy aftermarket supply chains, slowing of resource flows

# Pro-active and sustainable data management in supply

**Chains, A matter of company size** Wanja Wellbrock Christoph Hein Daniela Ludin Wolfgang Gerstlberger Erika Müller Javier Villalba-Diez

#### ABSTRACT

#### Purpose

This paper examines how data management is implemented within German speaking companies. The idea behind industry 4.0 is complete transparency along the value chain. Main requirement for achieving this is a holistic and sustainable data management process in and between companies of interlinked value chains. The paper focuses on differences based on company size regarding the corresponding implementation level.

#### Design/methodology/approach

The paper addresses the topic of data management by a large-scale empirical study focusing on potentials, advantages and the operative and strategic status quo of data management within and between single companies of a supply chain. In total, 228 German-speaking companies are integrated in the empirical sample. To ensure statistical significance, the t test is used for quasi-interval scaled indicators and the binomial test for dichotomous indicators. Finally, general recommendations for companies are derived based on the empirical data.

#### Findings

Companies are able to gain a benefit from cross-company data management. There is a variety of deployment options in all sectors, depending on the availability of data and the willingness to restructure the flow of information. An information supply chain is developed in the paper as a conceptual basis to achieve these potentials of big data solutions in the supply chain. The empirical data shows that there is a pent-up demand with regard to the organizational structure of data management within the companies and the integration of supplier data in their own decision-making. For some aspects, especially the organizational structure, the company size has a significant impact on the results.

#### **Research limitations/implications (if applicable)**

A limitation of the empirical approach is the fact that different industries are examined to get a general understanding of the topic. Therefore, further research should focus on single industries to obtain deeper insights. Another shortcoming is the limitation on German speaking companies. It should be analyzed whether there are national differences in a global context.

#### Practical implications (if applicable)

The empirical study provides benchmark data and derives recommendations for companies.

#### Original/value

This is one of the latest studies, which assesses the current maturity of data management in and especially between companies of a supply chain. The paper follows a holistic understanding of data management and combines company and cross-company data sources while most other papers concentrate on one side of both.

*Keywords:* Supply chain management, data management, information supply chain, big data, analytics

# CONSUMER TO CONSUMER SUPPLY CHAINS: LESSONS FROM A STYLISH CASE

#### Aurélien Rouquet\*, Christine Roussat\*\* and Valentina Carbone\*\*\*

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### ABSTRACT

#### Purpose

The supply chain management literature has widely explored the forward and reverse supply chains that connect businesses to consumers. It has so far neglected the consumer-to-consumer physical flows that connect consumers with each other when they sell, rent, swap or donate goods. The objective of the paper is to point out the existence of CtoC supply chains and highlight the reasons for investigating them.

#### Design/methodology/approach

We study the emblematic and extreme case of Vestiaire Collective, a platform that connects private individuals who buy and sell second-hand luxury items. This case meets Siggelkow's 'talking pig' criterion in the sense that it allows us to illustrate the complexity that may characterise physical flows between consumers.

#### Findings

The contribution of this paper is to point out the existence of supply chains between consumers, to describe their characteristics and to consider the ways in which they may be relevant to supply chain management.

#### **Research limitations**

The paper is based on a single case study. As such, further empirical research will be necessary to study CtoC supply chains in more detail and deepen our theoretical and managerial understanding of them.

#### What is original/value of paper

The paper identifies, defines and characterises CtoC supply chains. Should the scope of SCM be expanded to include CtoC supply chains?

Keywords: consumer, case study, supply chain, peer-to-peer, sharing economy

# ATTITUDES OF FINNISH ROAD HAULAGE COMPANIES TOWARDS ENVIRONMENTAL GOALS AND MEASURES

#### Markus Pöllänen\* Timo Liljamo\*\* Erika Kallionpää\*\*\* Heikki Liimatainen\*\*\*\*

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# ABSTRACT

#### Purpose

As road transport is an integral part of supply chains, and improving sustainability is becoming increasingly important, this study analyses the environmental practices and awareness of road freight hauliers, and whether the hauliers are witnessing interest from their customers towards their energy efficiency.

#### Design/methodology/approach

In this study, results of an original survey (N=256) done in 2019 among Finnish hauliers are presented and compared with a similar survey done in 2011. Survey results are discussed with findings from previous studies.

#### Findings

Even though hauliers share the view that emissions from road freight transport must be reduced in future, the hauliers' environmental practices have not changed much during the 2010s. The hauliers rarely perceive interest from their shippers towards energy efficiency.

#### **Research limitations**

The number of survey respondents presents a small portion of Finnish road hauliers. Therefore, the respondents might be especially the companies, which are more environmentally aware.

#### **Social and Practical implications**

The results show that the hauliers should be supported and encouraged to pursue more environmentally aware practices. Shippers in the supply chain should be a driver not an obstacle for increasing road hauliers' sustainability. There should be more communication between the hauliers and supply chain actors, and ecological issues should gain more importance when selecting carriers.

#### Original/value

This paper presents original results with a comparison between a recent (2019) and past (2011) survey. The results highlight the lack of improvement in hauliers' environmental practices during the decade when ambitious climate goals have been set.

Keywords: road freight, road haulage, road haulage company, road freight transport company, road haulier, attitude, environment, emissions, survey

# Interaction for successful Implementation of Climate Smart Freight Technology

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## ABSTRACT

#### Purpose

Liquified biogas (LBG) is an innovative fuel technology that is presumed to provide climate smart freight. The process of implementing innovative fuel technology is complex and requires several different interactions. Inter-organizational as well as intra-organizational interactions are necessary for a successful large-scale implementation. This paper aims to explore different forms of interaction (how), during different stages of the implementation process (when), between organizations (who), required to implement LBG technology in freight transports.

#### Design/methodology/approach

The paper is based on a case study at a large Nordic LSP, currently implementing LBG. The unit of analysis was the interactions formed between different organizations, needed for implementation.

#### **Findings**

The paper identifies forms of interaction needed to implement LBG in fleets. Findings shows forms of interaction required at different stages of implementation and between whom. Additionally, it presents prerequisites that facilitates the interactions.

#### **Research limitations/implications**

Contributions to increase the understanding of interactions required for implementing technical solutions for environmentally friendly transports. For an increased external validity, more organizations need to be studied.

#### **Practical implications**

Enables LSPs to identify organizations and actors with whom interaction is necessary for implementing new fuel technology, and what type of interaction that is needed.

#### **Social implications**

Provides support for LSPs to implement climate smart alternatives which facilitates transitioning to sustainable freight transports.

#### **Original/value**

Different forms of interaction for transitioning to fossil free fuel are key in the process of greening LSPs. This paper provides support for the forms of interaction needed during different stages of transition.

Keywords: Green Freight Transport, Fossil Free Freight, Inter-organizational interaction, Intra-organizational interaction, Collaboration, Innovative Fuel technology, Sustainable Logistics, Supply chain management.

# LOGISTICS SERVICE PROVIDERS IN HUMANITARIAN RELIEF

#### New kids on the block

#### Diego Vega Christine Roussat Gyöngyi Kovács

### ABSTRACT

#### Purpose

Logistics services in humanitarian relief are provided by a myriad of actors. Academic literature has looked at the logistical activities of humanitarian organisations (HOs), as well as the involvement of commercial logistics service providers (LSPs) in the field. However, it has overlooked other types of actors involved in the provision of humanitarian logistics activities. The purpose of this paper is therefore to map out the different types of actors working with logistics in the humanitarian context, to identify their contributions and revise existing taxonomies to include these new types of organisations.

#### Design/methodology/approach

New actors have been identified through a variety of previous research projects. Their roles and responsibilities are analysed on the basis of openly available data such as reports and websites.

#### Findings

Results show the existence of a number of other actors, namely non-profit logistics service providers and for-profit humanitarian organizations, that have not been identified in the humanitarian logistics literature. A continuum of their activities is proposed.

#### **Research limitations/implications (if applicable)**

The proposed taxonomy contributes to the growing body of knowledge in logistics servitization for humanitarian relief, setting the ground for future research on topic-related studies. Research also confirms and illustrates the interweaving of not for profit and commercial approaches in the relief field.

#### Original/value

Not for profit LSPs as well as for profit HOs, have not been in focus in previous research. This is the first taxonomy that maps out their activities and contrasts them to previously researched established organisations.

Keywords: Logistics service provider, taxonomy, humanitarian logistics

External costs of inland waterway transport An analysis of external cost categories & calculation methods

#### Florian Hofbauer Lisa-Maria Putz

## ABSTRACT

#### Purpose

Sustainable transport is a major worldwide topic to tackle climate change. One option for a sustainable transport system is to increase the use of inland waterway transport (IWT), since it has very low emissions and external costs. The goal of this paper is a critical review and state-of-the art analysis of external cost categories (e.g. accidents, emissions) and calculation methods of IWT and to provide research ideas for future studies.

#### Design/methodology/approach

We used a literature review to identify the papers dealing with external costs of IWT resulting in 13 studies. The papers were assigned to seven external cost categories.

#### Findings

The data basis of IWT is significantly lower than for road/rail transport. Climate Change and air pollution are the external costs considered most often. Schroten et al. (2019) and PLANCO (2007) were identified as external cost calculation methods for IWT. Measurement of energy consumption and related emissions of IWT needs to be improved to get more accurate consumption data and thus ensure an accurate comparison with other modes of transport.

#### **Research limitations/implications**

The data basis of IWT must be qualitatively as well as quantitatively brought up to the level of road traffic in order to ensure more realistic comparisons of the transport modes.

#### Original/value

Our study compares literature dealing with external costs for IWT and focuses on a critical examination of the external cost calculation methods to reveal its strengths and weaknesses and to highlight the need for further research.

*Keywords: external costs, freight transport, international waterway transport, external cost calculation methods, emissions, sustainability* 

# INTEROPERABILITY CHALLENGES IN TRACEABILITY OF PHARMACEUTICALS

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### ABSTRACT

#### Purpose

As the risk of falsified pharmaceuticals in Pharmaceutical Supply Chains (PSCs) has increased, actors face challenges in implementation of traceability. The purpose of this paper is to address interoperability challenges to enhance traceability of prescribed pharmaceuticals

#### Design/methodology/approach

The study followed a systematic combining approach (Dubois and Gadde, 2014). A literature review was conducted to create interoperability framework. A case study of a Swedish PSC of prescribed pharmaceuticals was used to explore interoperability challenges to enhance traceability.

#### Findings

This paper fills a gap in the published literature on interoperability to enhance traceability in PSCs and presents an interoperability framework that can be used in further studies on traceability in supply chains

#### **Research limitations/implications**

The research is based on a case study of a Swedish PSC of prescribed pharmaceuticals. Further empirical studies that include PSC of over-the-counter pharmaceuticals, and at an international level are required to ensure statistical generalisability.

#### **Practical implications**

The framework presented will support PSC actors seeking to enhance traceability of prescribed pharmaceuticals. The presented research complies with the European Directorate for the Quality of Medicines and Healthcare (EDQM) ongoing work to enhance safety and quality of pharmaceuticals

#### Original/value

While literature from several academic disciplines presents solutions to traceability in SC, little research has been conducted which address interoperability to enhance traceability of prescribed pharmaceuticals.

Keywords: Traceability, Pharmaceuticals, Interoperability, Distribution.

# Technology selection in supply chain management

### Influencing factors and success practices

#### Stefan Selensky Erik Hofmann

### ABSTRACT

#### Purpose

As emerging technologies and the concept of industry 4.0 are on the rise, available solutions for SCM get more complex and dynamic. Because technology adoption is crucial to stay competitive but resources of companies are limited, the purpose of this paper is to gain insights into successful management of technology selection in SCM.

#### Design/methodology/approach

Using an interview-based case study approach, in-depth polar cases of technology selection in various industries were collected. Resting on the collected data, transcript coding to analyze information within and across the cases was used. Drawing on contingency theory, supply chain-specific influencing factors and according management practices were identified.

#### Findings

The research reveals eight groups of contingency factors which influence the design of successful technology selection in SCM, e.g. complexity and criticality. Moreover, ten themes of response variables were identified, systemizing the options when designing technology selection. Those themes can be differentiated into selection process and selection organization.

#### **Research limitations/implications**

The paper is limited by its qualitative approach and the number of case studies conducted.

#### **Practical implications**

The results provide implications for practitioners by structuring the problem and solution space of technology selection and giving guidelines on choosing technology selection design adaptively.

#### Original/value

This research is among the first to provide in-depth insights in technology selection from a firm's perspective considering SC specific contingencies. Also, it introduces a new perspective on technology selection as a management process.

*Keywords:* Supply chain management, Supply chain technologies, Technology selection, Industry 4.0, Contingency theory

# Sustainable Innovation: The role of Supplier Innovativeness in the Humanitarian Context

#### Sabari R Prasanna

### ABSTRACT

#### Purpose

Innovation in the humanitarian supply chain (HSC) context is essential to meet the varying needs of beneficiaries around the world. Sustainability is increasingly gaining importance in the HSC context. Suppliers for humanitarian organizations play a vital role in delivering sustainable and innovative products to the beneficiaries. This study examines the phenomenon of supplier innovativeness in long-term aid delivered by a non-governmental organization (NGO).

#### Design/methodology/approach

A single case study approach is employed to investigate the antecedents and drivers of supplier innovativeness in the NGO-led HSC.

#### Findings

A novel framework for supplier innovativeness in the HSC context is proposed. The results indicate that the supplier innovativeness delivers economic, environmental, and societal sustainability in the HSC.

#### **Research limitations/implications**

This study is one of the pioneers in examining supplier innovativeness in the HSC. The framework presented could act as a precursor of future research in supplier innovativeness in the HSC. This study follows an exploratory approach using a single case study therefore the generalisability of the findings are constrained.

#### **Practical implications**

Supplier innovativeness plays an important role in the new product development. The framework presented could be of help to procurement managers in the HSC as to informing ways of improving sustainable innovation in the HSC.

#### **Social implications**

This study has implications for improving livelihood of beneficiaries from economic, social, and environmental standpoint

#### **Original/value**

This is a original paper adding a new phenomenon – supplier innovativeness to the HSC literature.

Keywords: Supplier innovativeness, humanitarian supply chain, case study, sustainability.

# FLEXIBILITY IN PORT LOGISTICS BY ADAPTIVE PORT PLANNING, A CASE STUDY OF THE PORTS OF ISAFJORDUR NETWORK IN ICELAND

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# ABSTRACT

#### Purpose

Ports are strategic nodes in the global logistics network. Ports have prominent status in supply chains and international trade by providing service to port users with dynamic characteristics. The port eco-system is faced with fierce market competition and an uncertain business environment. Inefficient port logistics impact port users throughout the supply chain. A flexible port logistics plan is purposed to fulfill the demands of port users.

#### Design/methodology/approach

This paper explores port layers including physical infrastructure, operation and management, and product and service. Port functions and activities are elaborated on. A SWOT analysis is and vulnerabilities of the demand side of the supply chain. Timely and effective actions are defined in the planning process aimed at seizing opportunities and mitigating, shaping, and hedging vulnerabilities in the projected lifetime of the port.

#### Findings

This paper is applied to the Ports of Isafjordur Network in Iceland, including the third busiest port of call for cruise ships in the country. The results show that marine products processing and servicing cruise vessels can be decentralized and shifted in the port network. The results promote the supply chain integration by optimizing collaboration in the port network. In the context of uncertainty and complexity, the Port Authority should strategically develop value-adding clusters in the port network.

#### Original/value

By application of adaptive planning, this paper delivers flexible solutions in port logistics to timely and effectively meet the demands of port users. Therefore, it helps to consolidate the competitive position of the port.

Keywords: Flexible port logistics, Adaptive port planning, Competitiveness, Iceland

# THE IMPACT OF THE BELT AND ROAD INITIATIVE ON INTERNATIONAL REVERSE LOGISTICS

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### ABSTRACT

#### Purpose

This paper aims to understand how the specific content of the Belt and Road initiative influence performances of international reverse logistics of international reverse logistics service providers.

#### Design/methodology/approach

This paper develops propositions based on literature review on the content of the Belt and Road Initiative and key performance indicators for international reverse logistics.

#### Findings

The developed propositions show that different elements of the Belt and Road initiative (e.g. cooperation agreements, infrastructure connectivity, unimpeded trade, financial integration and closer people-to-people ties) impact the international reverse logistics performance of international reverse logistics service providers (e.g. environmental, financial, innovation and growth, flexibility) differently.

#### **Original/value**

Cross border policy, agreements and infrastructure development between governments are relevant and important variables influencing international logistics performance including international reverse logistics. Although the initiative of the belt and road has received increasing research attention from academics, there is however lack of studies on its impact on the international reverse logistics. This study proposed a number of propositions regarding impacts of the belt and road initiative on international reverse logistics performance.

*Keywords: The Belt and Road Initiative, international reverse logistics, international reverse supply chain, performance.* 

# AN EMERGING PARTNERSHIP BETWEEN NON-PROFIT ORGANIZATIONS AND COMPANIES IN REVERSE SUPPLY CHAINS:

### **ENABLING VALORIZATION OF POST-USE TEXTILE**

#### Anna Zhuravleva and Anna Aminoff Hanken School of Economics

### ABSTRACT

#### Purpose

Non-profit organizations are the largest collector of post-use textile worldwide and enabler of reverse cycles for reuse, redistribution and recycling. The study aims at understanding the barriers and drivers for establishing partnership between non-profit organizations and companies for textile valorization.

#### Design/methodology/approach

The study applies the theoretical framework for analyzing factors that affect development and growth of circular business. The study employs an embedded case study approach; it follows two leading non-profit organizations in their attempts to collaborate with other organizations and companies. Main data sources include semi-structured interviews and documents.

#### Findings

The theoretical framework is proven to function in a new context of textile valorization. The study demonstrates the barriers and drivers in establishing the partnership for textile valorization using a theoretical framework.

#### **Research limitations**

Further research should consider increasing the number of cases and studying different application areas.

#### **Practical implications**

The partnership potentially offers non-profits an economically and environmentally viable option for managing excessive textile inflows while companies can utilize post-use textile pre-sorted by non-profits as raw material for their products. Studying barriers and drivers allows creating an understanding why these actors currently co-exist in tension and coopetition.

#### **Social implications**

The partnership aims at reducing environmental pollution and achieving resource efficiency. Sourcing textiles from non-profits supports global development work as their earnings are utilized for a charitable cause.

#### Original/value

The study looks at a new and potential form of partnership in reverse supply chains for enabling circularity and developing truly sustainable supply chains.

Keywords: Post-use textile, non-profit, companies, reverse supply chain, textile valorisation, circularity, reuse, recycling.

# LEGAL ASPECTS OF ADDITIVE MANUFACTURING IN THE MILITARY LOGISTICS

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### ABSTRACT

#### Purpose

The use of Additive Manufacturing (AM) in military logistics is limited by the uncertainty about the legal risks of using the method. The purpose of this study was to identify the potential legal risks associated with AM of military materiel and its effects.

#### Design/methodology/approach

The study was conducted as a case study, where AM is considered in military logistics. Legal issues were approached from the normative point of view in the context of potential legal dispute situations with four different cases. The topic was studied by reviewing and analyzing literature sources, official sources and Finnish Defense Forces military materiel purchasing contracts.

#### Findings

The study interpreted and systematized the general principles of IPR and contract law when using AM in the military. An identified result of the study was that the use of AM to print military materiel under normal conditions may entail risks that should be contractually managed. In other cases, e.g. crises or wartime, there are risks, but they are difficult to predict and manage or are acceptable.

#### **Research limitations/implications**

The results of the study concern countries with similar military economics system to Finland in terms of military logistics. The conventions and policies of the superpowers may differ.

#### **Original/value**

The research will provide information to decision-makers for the preparation of contracts for the acquisition and maintenance of military material and implementing AM to military logistics.

Keywords: Military logistics, Additive Manufacturing, Contract law, Immaterial Property Rights, Legal Risks

# INTERMODAL SOLUTIONS: CRITICAL SUCCESS FACTORS IN THE SOUTH AFRICAN FMCG SECTOR

Jan Havenga Zane Simpson Anneke De Bod Isabel Meyer Esbeth Van Dyk

## ABSTRACT

#### Purpose

Macro-level logistics cost and flow modelling have highlighted intermodal solutions as a means of optimising key South African (SA) freight corridors. This paper explores the critical success factors for translating the macro opportunity to a sustainable intermodal solution for the fast-moving consumer goods (FMCG) sector.

#### Design/methodology/approach

The paper integrates flow model results with a review of academic and popular literature of the SA FMCG logistics landscape to outline the implications of intermodal solutions for logistics service providers

#### Findings

The study identifies a significant growth opportunity for FMCG freight on rail, characterised by stable, naturally unitised volumes of low price elasticity; intermodal solutions would decrease the complexity for the rail service provider while increasing predictability for customers.

#### **Practical implications**

Adoption of an intermodal solution requires a more flexible, focused, and responsive engagement from the rail service provider. These requirements are described, and the immediate organisational focus areas for the rail provider are outlined.

#### **Social implications**

Intermodal solutions have the potential to facilitate a significant shift of freight from road to rail, thus reducing environmental impact

#### Original/value

The study succeeds in translating the quantified macro-level argument for intermodal solutions to the organisational implications and next tactical steps for the FMCG industry, to position towards sustainable implementation of intermodal solutions.

Keywords: intermodal solutions, rail freight, road freight, cost modelling, freight flow modelling, South African FMCG sector

# The Delphi Technique Limitations and possibilities

#### Thomas Ekström \*,\* \*

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### ABSTRACT

#### Purpose

The dual purpose of this paper is to analyse the implications on research rigour of using two panels in a Delphi study, and to take a first step towards investigating how researchers in logistics and SCM establish rigour in Delphi studies.

#### Design/methodology/approach

Based on a literature review on research rigour in Delphi studies, this paper analyses how a modified design, with two panels, effected research rigour in a Delphi study that produced unexpected results. The paper also conducts a pilot literature review on Delphi-studies in logistics and SCM research, and investigates how these authors establish research rigour.

#### **Findings**

This paper finds that with two panels, researchers may enhance rigour in a Delphi study, but also that such a design may lead to results that would be less likely with a conventional design, especially if combined with concluding workshops. The pilot literature review indicates that Delphi-studies in logistics and SCM research establish rigour through the provision of an audit trail, rather than by explicitly discussing the quality criteria of correspondence and/or trustworthiness.

#### **Research limitations/implications (if applicable)**

The research indicates limitations with a conventional Delphi design, with one expert panel, and opportunities with a modified design, with two panels. Further research is required to explore these indicative findings.

#### **Original/value**

The paper demonstrates how a modified design of the Delphi technique, in combination with concluding workshops, can produce results and insights that would be more difficult to achieve with only one expert panel.

Keywords: Delphi technique, rigour, modified design.

# DEVELOPING SUSTAINABLE CITY LOGISTICS BY IMPLEMENTING ELECTRIC FREIGHT TRUCKS

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#### Purpose

The purpose of this paper is to study the use of electric vehicles, especially electric freight trucks in the context of sustainable city logistics development. The aim is to analyse the contribution, effects and suitability of electric freight trucks in city logistics.

#### Design/methodology/approach

The paper is based on literature review and two-part case study in Tampere, Finland. The electric freight trucks' role, benefits, challenges and effects related to developing sustainable city logistics are studied. In the case study, user experiences and specific distribution routes of the case company are examined. The case study builds on a 4-year use and monitoring of an electric freight truck.

#### Findings

As a result, the effects and suitability of implementing electric freight trucks in sustainable city logistics are introduced. The electric freight trucks could bring significant benefits compared to diesel freight trucks in developing sustainable city logistics. Potential for more cost- and energy-efficient distribution with reduced emissions and noise makes electric freight trucks a real option for urban freight distribution and for reaching sustainability targets in cities.

#### **Original/value**

The new information about the role of electric distribution vehicles in sustainable city logistics development is gained. The paper gives valuable decision support for companies when considering investments in electric freight trucks and for cities when considering incentives and developing their urban environment and infrastructure, especially support for charging electric distribution vehicles.

*Keywords: City logistics, urban logistics, electric vehicle, electric freight truck, sustainability, user experiences, electrification, freight transport, distribution* 

# URBAN FOOD SECURITY AND DISTRIBUTION NETWORKS IN POOR NEIGHBOURHOODS OF BANGKOK

#### Virva Tuomala

### ABSTRACT

#### Purpose

This paper reports an interdisciplinary study exploring food security and distribution networks in poor urban neighbourhoods of Bangkok. Food security for citizens at the base of the pyramid (BoP) is often approached through retail availability, with solutions revolving around agricultural output and large food retailers. By adapting development study theory, this study postulates that in an urban poor context, it is more about ensuring existing distribution networks and local supply chains adequately provide nutritious food to positively affect BoP citizens.

#### Design/methodology/approach

An exploratory and qualitative empirical study using semi-structured interviews was conducted across three poor neighbourhoods in Bangkok. Data consists of 30+ interviews and were coded using NVivo.

#### Findings

A predominance of street food vendors is a major source of available and nutritious food for citizens. Also, a prevalence of micro food retailers alleviates scarcity and food insecurity. These local sources provide the best alternative for Bangkok's urban poor as opposed to larger retail grocery chains that are more expensive and limited in locations.

#### **Research limitations/implications (if applicable)**

Local micro food retail in BoP or urban poor environments is more efficient and effective compared to large food retail chains concerned about throughput at low cost. As this study is qualitative and exploratory further research is required to establish wider generalizability.

#### Practical implications (if applicable)

Food retail management at grassroots level, consisting of micro retailers and informal networks, responds better than formal and large retailers to the dynamics of urban poor neighbourhoods in different geographical contexts, and generates opportunities for small traders to develop and flourish.

#### Social implications (if applicable)

This study highlights the importance of micro retailers at the forefront of food access and security discourse in policy and planning

#### **Original/value**

Interdisciplinary approach in investigating food security in urban contexts, highlighting food retails and distribution networks.

# *Keywords: Food security and access, base of the pyramid, poor urban neighborhoods, micro retailers, Bangkok*

# Decade of purchasing and supply management in Finnish annual reports Topic modelling of top management attention

Tuomas Kiiski Sini Laari Harri Lorentz

### ABSTRACT

#### Purpose

Managers and scholars suggest that purchasing and supply management (PSM) is increasingly considered to be a strategic function. This paper uses text mining of annual reports from 2008-2018 to provide a perspective on how and in what context PSM is discussed in the reports during the last decade

#### Design/methodology/approach

Annual reports from years 2008-2018 for firms listed in OMX Helsinki 25 stock index were analysed using automated text mining techniques and topic modelling.

#### Findings

Six key topics were identified in the data: supplier management, global manufacturing network, sustainable procurement, raw material sourcing, supply chain management, purchasing power. These key topics provide interesting perspective on how PSM is perceived as a function in publicly listed companies.

#### **Research limitations/implications**

The study has a narrow geographic scope and arbitrarily defined timeline. Future research should expand both the geographical coverage and the time period used to observe the reports.

#### **Practical implications**

For practitioners the results point out prominent PSM themes that should be on the top management team's agenda. The results also offer an opportunity to benchmark the strategic agenda in terms of PSM.

#### **Original/value**

To our knowledge, this is one of the first papers to employ text mining to the field of PSM. This paper builds on the attention-based view of the firm and argues that the strategic agenda as communicated in the reports reflects the focus of attention in the top management team as well as development of particular functions of the company.

*Keywords: Purchasing and supply management; text mining; topic modeling; annual reports* 

# A Community Detection of Stakeholders in Risk Management at the Port of Hamburg

Ayman Nagi Meike Schroeder Wolfgang Kersten

# ABSTRACT

#### Purpose

The aim of this work is to detect communities of stakeholders at the port of Hamburg with regard to their communication intensity in activities related to risk management

#### Design/methodology/approach

A compact survey at the port of Hamburg is utilized to address the communication intensity values among stakeholders. Based on 28 full responses, the data is extracted, cleansed, and prepared for the network analysis using the software "Gephi." Thereafter, the Louvain community detection algorithm is used to extract the communities from the network. A plausibility check is carried out using 15 semi-structured interviews and secondary data to verify and refine the results of the network analysis and community detection.

#### Findings

The results have revealed different communities for the following risk categories: a) natural disasters and b) operational and safety risks. The focus of cooperation is on the reactive process and emergency plans. For instance, emergency plans play an important role in the handling of natural disasters such as floods or extreme winds.

#### **Research limitations/implications**

The actual research limitation is extracted from the nature of survey studies: the number of full responses may have restricted the network analysis and community detection. This paper contributes to seaport-related cooperative risk management, which requires the careful analysis of relevant stakeholders as well as their tasks and responsibilities for activities related to risk management

#### **Practical implications**

The identification of relevant stakeholders and the associated cooperation aspects are essential for risk management in seaports. This study is part of a European research project that focuses on the development and validation of a prescriptive process model for cooperative risk management in seaports.

#### **Original/value**

This study presents the first community detection analysis of stakeholders at the port of Hamburg concerning communication activities related to risk management to guide future research in this field.

Keywords: Seaport, Community Detection, Risk Management, Network Analysis

# USING GPS DATA TO MAP FREIGHT VEHICLE MOVEMENTS IN URBAN AREAS

## LOGGING IN-VEHICLE DATA FROM 1600 NORWEGIAN VEHICLES

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# ABSTRACT

#### Purpose

The current paper addresses how GPS data from freight vehicles can give detailed information on freight activities in urban areas, with examples of delivery/pickup activities in seven Norwegian cities. Such information is key when planning for freight activities in urban areas– e.g. when dimensioning the capacity of loading/unloading zones.

#### Design/methodology/approach

For 2019, a dataset of 79 million GPS positions was retrieved from 1600 freight vehicles. We present a method to convert GPS data into information on freight vehicle movements, including an approach to separate delivery/pickup activities from other stop activities in urban areas.

#### Findings

The study shows that detailed information on delivery/pickup activities in urban areas may be attained from GPS data. We find that dwell time averages differ between city areas and vehicle types in Norway.

#### **Practical implications**

Today, most studies of this type are based on data from voluntarily participating firms, resulting in sample biases. However, as all new freight vehicles include a possibility of GPS tracking, there is a vast future potential of such data, and this study shows how this data can provide transport authorities/planners with information at a more detailed level than traffic counts and at a lower cost than traditional observation studies

#### **Original/value**

Several studies have addressed the issue of converting GPS data to trip information and identification of stop activities. However, we find less work on how this data may provide new insights into freight vehicle movements and activities in urban areas, and, in turn, how it may contribute to improved policy making towards the goal of a greener and more efficient freight transport in urban areas.

Keywords: GPS, Transport and distribution management, Urban freight, Road transport, Freight Delivery Time

# NTECEDENTS OF PREFERRED CUSTOMER STATUS

### IN MANUFACTURING AND SERVICE BUSINESSES

#### Aki Jääskeläinen Katrina Lintukangas Jussi Heikkilä

### ABSTRACT

#### Purpose

This study increases understanding on how to become a preferred customer in both manufacturing and service businesses.

#### Design/methodology/approach

Survey receiving 482 supplier responses is utilized and analyzed with partial least squares (PLS) technique.

#### Findings

Supplier satisfaction partially mediates the positive link of shared goals in a buyer-supplier relationship and a supplier's expectations of continuity to preferred customer status. This mediation is full in the case of a buyer's investment to the relationship. However, these mediation effects are present only with manufacturing customers. Surprisingly, cultural similarity between a buyer and a supplier does not have a positive link to supplier satisfaction or preferred customer status

#### **Research limitations**

A future study could capture also the perceptions of a buyer firm in order to complement the results of this study. Service companies included in this study represented only ICT sector.

#### **Practical implications**

This study presents how the practices in buyer-supplier relationships can support the achievement of preferred customer status.

#### **Original/value**

This study contributes to the literature by providing empirical evidence on the antecedents of preferred customer status with a large data set represented by both manufacturing and service customers. It demonstrates that the prevailing knowledge is not directly applicable in both contextual settings. It also clarifies the interdependencies between the antecedents of preferred customer status, i.e. the role of supplier satisfaction as a mediator

Keywords: buyer behavior, preferred customer status, supplier satisfaction, service purchasing.

# EXPLORING FACTORS CAUSING AND AMPLIFYING DELIVERY SCHEDULE INSTABILITY: AN OEM PERSPECTIVE FROM THE AUTOMOTIVE INDUSTRY

#### Hafez Shurrab Patrik Jonsson

### ABSTRACT

#### Purpose

The purpose is to explore how OEMs generate instabilities in material delivery schedules within automotive supply chains.

#### Design/methodology/approach

A multiple case study of three automotive OEMs were conducted to collect qualitative and quantitative data as to explore factors causing and amplifying schedule instability measured by inaccuracy and nervousness. The quantitative data includes two-year delivery schedule history, and the qualitative data includes the OEMs' manufacturing planning and control processes and policies

#### Findings

From literature and cross-case analysis, the study generates a framework of causing and amplifying variables. Four factors (take rate, transport lead times, unit loads, and pick-up frequency) were proposed to have common and significant impact on schedule instability. Take-rate and transport lead time amplify schedule inaccuracies, and pick-up frequency amplifies schedule inaccuracy for items with low take-rates.

#### **Research implications**

The quantitative study analyses the amplifying effect of a few selected factors at one of the OEMs. Future studies may address additional factors including causes like production disturbances and may validate the findings at more OEMs.

#### **Practical implications**

Understanding the amplifying effect at an item level guides the instability dampening policy making at OEMs to, for instance, establish clusters of components with sensitivity profiles.

#### Original/value

The study compliments previous frameworks with refined and additional factors, exploring empirically rich data about how OEMs, an understudied perspective, propagate schedule instability, an area dominated by simulation studies.

Keywords: Schedule Instability, Nervousness, Schedule Inaccuracy, MRP, Rescheduling.

# A Value-Based View of Environmental Behavior and Financial Performance

Oskari Rintala Sini Laari Tomi Solakivi Juuso Töyli

### ABSTRACT

#### Purpose

Validity of the widely researched link between business companies' environmental and financial performance has been found be contingent on numerous moderating factors. This study addresses the influence of firms' institutional settings on the relationship. It is argued that financial performance can be leveraged through conformity with values prevalent in companies' institutional surroundings.

#### Design/methodology/approach

Individuals' values and environmental beliefs, as available in European Social Survey 2016, were studied together with performance data of European companies. Multilevel latent profile analysis was used to group countries on the basis of acquired individual level behavioral profiles. Moderation analysis was then used to determine the effect of country group on the relation between companies' environmental and financial performance.

#### Findings

Three distinct country groups are identified on basis of the analysis. The findings further indicate that market values and beliefs moderate the relationship between environmental and financial performance.

#### **Research limitations/implications**

More research should be done to better understand the relation between institutional context and firm performance

#### **Practical implications**

It is proposed that businesses should be aware of and comply with market values to avoid costs and be able to capitalize on environmental performance.

#### **Social implications**

Societal level changes in the inclination to pro-environmental behavior may also affect economic systems through diverse mechanisms.

#### **Original/value**

The paper provides a novel approach to the issue of when it pays to be green.

*Keywords: institutional theory, value, belief, environmental behavior, multilevel latent profile analysis, moderator analysis, environmental performance, financial performance* 

# ATTENTIONAL DRIVERS OF TECHNOLOGY SEARCH BEHAVIOR AT LOGISTICS SERVICE PROVIDERS

#### **Mathias Mathauer**

### ABSTRACT

#### Purpose

This paper sheds light on the antecedents of technology search behavior by logistics service providers (LSPs) under consideration of firm size, substantially contributing to the understanding of the relationship between external aspects of the search environment and search behavior on the firm level.

#### Design/methodology/approach

Based on a comparative case study design including seven technology cases at four large and three small LSPs, organizational search behavior is contrasted with regard to firm size. The attention-based view (ABV) serves as a theoretical underpinning.

#### **Findings**

The findings illustrate that the external antecedents of technology search behavior encompass both opportunities and threats. Customer-, market-, and technology-related triggers stem from these categories. The actual effect of each antecedent depends on firm size and differs in terms of search selection (breadth of the search) and search intensity (depth of the search).

#### **Research limitations/implications**

The paper is limited by its qualitative research approach; only seven different LSPs are included in the study. Thus, the scope of investigated technology searches is broad, but not exhaustive.

#### **Practical implications**

Decision-makers at LSPs profit from understanding the attentional mechanisms underlying their search behavior, as resources can be allocated more effectively and blind spots removed.

#### **Original/value**

This is the first study to identify external antecedents of technology search behavior from an ABV, thereby adding the notion of outside-in problemistic searches and external threats to the debate on attentional drivers of organizational searches.

Keywords: Technology selection, case study research, logistics service providers, search behavior, innovation adoption, attention-based view.

# MEASURING AND SHARING DATA ON KPIS FOR TRANSPORT EFFICIENCY:

### AN INTERVIEW STUDY OF SHIPPERS AND TRANSPORT PROVIDERS

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### ABSTRACT

#### Purpose

To reach the goal of a fossil-free transport, large changes are necessary, and to lay a foundation for this a first step is to measure the current performance. The purpose is, therefore, to identify what Key Performance Indicators (KPIs) transport providers measure, follow up and how they share these with their customers (i.e. shippers) to improve transport efficiency.

#### Design/methodology/approach

Data has been collected through 23 semi-structured interviews, with 10 shippers and 13 transport providers in Sweden.

#### Findings

The results show what KPIs are measured by transport providers and shared with shippers. The collection of emission-related KPIs was high, while surprisingly few follow up on time and vehicle utilisation KPIs. Measurements and follow-up were constrained through (1) a lack of tools for efficient measuring and follow-up, and (2) a lack of demand for certain KPIs and processes for sharing these between shippers and transport providers.

#### **Research implications**

The results show that a more standardised way of measuring and sharing of all types of KPIs is needed, at a minimum nationwide.

#### **Practical implications**

The results can be used by transport providers and shippers to understand how they jointly can improve transport efficiency by measuring and sharing data on KPIs.

#### **Original/value**

The academic contribution lies in describing what KPIs are measured by transport providers and shared with shippers. The study builds on previous literature on KPIs for transport efficiency and collaboration between shippers and transport providers and adds to the field by identifying what KPIs are currently applied in practice and how collaboration can be improved by increased sharing of KPIs.

*Keywords: Transport, Key Performance Indicators, transport efficiency, collaboration, information sharing.* 

Care pathways and hospital material logistics

Exploring the connection, opportunities and challenges

#### Logan Vallandingham Luitzen De Boer Heidi Dreyer

### ABSTRACT

#### Purpose

This paper investigates the potential of care pathways to inform purchasing and logistics planning and decision-making processes concerning the supply of hospital materials

#### Design/methodology/approach

The research area is nascent and, thus, a literature review and case study seem appropriate. The paper uses an OM/SCM lens to explore the care pathway concept, and its potential for providing early insight into demand for medical materials. Initial findings from a case study of a Norwegian hospital are presented

#### Findings

Preliminary findings suggest that, for a significant portion of materials, care pathways could act as direct or indirect input to logistics and purchasing processes, and thereby strengthen decision-making and planning processes.

#### **Research limitations/implications**

The paper is based largely on literature, and an early stage case study. Therefore, the research needs additional verification in a practical context, as some contextual factors may not be fully captured

#### **Practical implications**

The paper is relevant for healthcare practitioners working with purchasing and/or logistics, and sheds light on potential to change ordering processes, inventory management, and materials logistics within hospitals based on applying different levels of care pathway data in planning and decision-making processes at strategic, tactical and operational levels.

#### Original/value

Opportunities are highlighted to improve materials planning through using patient-related information and care pathways as an additional planning input and thereby extending existing literature and practice, which is seen as lacking.

Keywords: Care pathways, hospital materials, inventory management, healthcare logistics

# STRATEGIES FOR INDUSTRIAL PACKAGING SELECTION: A SYSTEMATIC LITERATURE REVIEW

#### Nathalie Silva Henrik Pålsson

# ABSTRACT

#### Purpose

Strategies for industrial packaging selection play an important part to maximise the potential of logistics systems and supply chains' performance. The purpose of this paper is to gather and analyse the relevant studies for industrial packaging selection, and present an overview of the knowledge on the topic. The paper frames the research in a way that both researchers and industrial practitioners can benefit from

#### Design/methodology/approach

A systematic literature review was carried-out and resulted in the analysis of 79 peer reviewed journal publications. The articles were analysed and clustered over different perspectives to provide a more comprehensive overview.

#### Findings

This study identifies four categories that define industrial packaging strategies: "improve supply chain efficiency encompassing industrial packaging", "enhance industrial packaging development process", "minimise environmental impact of industrial packaging" and "implications of industrial packaging regulatory compliance". Other analyses were performed: applied methodologies, publication outlets, relationship with sustainability and citation network analysis

#### **Research implications**

These analyses help to characterise the topic and structure the ways to improve supply chain performance: from a packaging assessment level to a supply chain management level such as logistics and operations management.

#### **Original/value**

By addressing the gaps in the literature and defining the research streams, this article supports both academic and industrial communities. It presents and analyses the relevant studies allowing for a clearer understanding of the state of the art, helping to structuring research and increasing awareness to the importance of strategic driven decisions.

*Keywords: Systematic Literature Review, Industrial Packaging, Strategies, Supply Chain, Selection.* 

# BUYING NEW DIGITAL SERVICE SOLUTIONS - A CUSTOMER PERSPECTIVE TO CO-CREATION

#### Pasi Rintamaa Jussi Heikkilä Aki Jääskeläinen

# ABSTRACT

#### Purpose

This research explores buyer-supplier relationships and co-creation of new service solutions in the context of novel digital technologies, i.e. Robotic Process Automation (RPA) and Artificial Intelligence (AI).

#### Design/methodology/approach

The paper builds on earlier research of solution provision from the suppliers' perspective. In-depth case studies were explored from the customer's perspective, in both two new technology environments. The research method was qualitative, exploring how the solution provision takes place in buyer-supplier collaboration. Social capital theory provided the theoretical frame for analysing the process of solution provision.

#### Findings

Initial findings suggest the importance of the cognitive element of social capital, the need for reciprocity in working and the iterative nature between the stages of diagnosis, design and implementation of the solutions.

#### **Research limitations/implications**

The paper is based on in-depth cases with limited generalizability of the results. It is part of a broader research scheme in which both the supplier and buyer perspectives are studied. The study will continue to enable broader elaboration of the theoretical contributions.

#### **Practical implications**

The findings bring forth a Center of Excellence (CoE) industry practice to enable co-creation of new digital service solutions.

#### Social implications

Knowledge intensiveness and technological complexity are growing, this study increases understanding of the role of social capital in this context.

#### **Original/value**

This study generates in-depth, qualitative understanding of the role of social capital in the co-creation of new types of digital services in buyer-supplier relationships.

Keywords: Purchasing, Supply management, Social capital, Buyer-supplier relationships, Digital business services.

# DEVELOPING A SERIOUS GAME FOR INTELLIGENT TRANSPORTATION SYSTEMS

SUB-TITLE OF PAPER, line 2 if needed

Ilja Bäumler Okan Dogtas Sercan Eyigün Moritz Elfers Fynn Gresens

## ABSTRACT

#### Purpose

Considering the increasing freight traffic and the associated negative effects, (e.g.: congestion, unpunctuality, waste of energy, harmful environmental influences etc.), systems for improving the status quo are being researched and implemented. The understanding and the acceptance of possible future applications in road freight transport must be brought to the users by appropriate means. This paper presents a prototype game on the topic of "Intelligent Transportation Systems for Road Freight Transport" and shows the interdependencies of the individual game elements.

#### Design/methodology/approach

A methodological triangulation was conducted. Firstly, we carried out theoretical research on the topics of game-based learning and ITS for road freight transport. Secondly, we created a questionnaire and gathered survey results from a games convention. Thirdly, we developed a serious game on a three-phased approach.

#### Findings

Questionnaire results show that more than half of the participants (n=31, average age=44 years) could not relate to intelligent transport systems but are familiar with logistics (games).

#### **Social implications**

By using the serious game presented here, the understanding of and need for intelligent transportation systems in society can be achieved. The decision to use intelligent transport systems in the logistics industry can be simplified for decision makers by playful interaction and beneficial consequences between the game elements.

#### **Original/value**

This paper describes the development stages of a serious game from problem definition to prototyping in the field of intelligent transportation systems. This serious (transport) game is the first game which incorporates intelligent transportation systems.

Keywords: Intelligent Transportation Systems, Road Freight Transport, Serious Game

# Choice and Customization of Urban Logistics concepts

### Towards a conceptual framework for structured developments of Urban Logistics Systems

#### **Raphael Preindl**

# ABSTRACT

#### Purpose

As urban logistics solutions need to be tailored to the individual situation on-site, the purpose of this paper is to develop a conceptual framework for the choice and customization of urban logistics concepts leading to a structured development of an urban logistics system (ULS). With a structured development of ULS, their successful implementation can be supported.

#### Design/methodology/approach

Using a design science research approach based on an extensive literature review, the paper develops a conceptual framework for structuring the development of urban logistics systems. Drawing on contingency theory, various situational factors were identified.

#### Findings

The research reveals that ULS must be customized individually and significantly depending on situational factors such as exo- and endogenous, as well as urban area-related contingencies.

#### **Research limitations/implications**

The paper is limited by its qualitative approach, which makes it necessary to evaluate the findings in further research empirically.

#### **Practical implications**

The results provide implications for local authorities and private actors (e.g., logistics service providers or shippers and receivers) by stating situational factors to be considered for the structured development of an individual ULS.

#### **Original/value**

While most of the academic literature in urban logistics draws on the development of concepts, few research was done looking at which situational factors influencing these concepts to achieve an individual ULS.

Keywords: Urban Logistics, City Logistics, Transport, Logistics, Distribution, Contingency Theory

# RETAIL SUPPLY CHAIN EFFECTS OF DIGITAL PRODUCT FITTING ON PRODUCT RETURNS

#### Emmelie Gustafsson \* Patrik Jonsson \* \* Jan Holmström \* \* \*

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### ABSTRACT

#### Purpose

One factor that affects product returns is fit uncertainty – when customers have difficulties evaluating the fit of a product pre-purchase. This paper determines the proportion of returns arising from fit uncertainty when end-customers order fashion shoes online and assesses the supply chain effects of fit-related returns and how digital product fitting technology can mitigate fit-related returns.

#### Design/methodology/approach

The estimated effects build on returns data from a Scandinavian fashion footwear retailer, containing 2,229 return transactions over 261 days. We analyze the current supply chain performance of the retailer's e-commerce operations. We then test the digital product fitting technology on the retailer's products and assess retail supply chain effects that such technology would have on product returns, and, in turn, how this cascade to product handling costs, tied-up capital, inventory holding costs, transportation costs, and order-picking costs.

#### Findings

Digital product fitting can mitigate fit uncertainty experienced by end-customers which leads to reduced product returns and reduced logistics costs. The most frequent cause of return for fashion shoes in the study is fit-related, accounting for 55 percent, where shoes are too small or too large. The cost of a pair of shoes being returned in the studied case amounted to  $\notin$ 4.95, which is 16.5 percent of the shoes' prime cost.

#### **Research limitations/implications**

The paper studies product returns from a supply chain effects standpoint.

#### **Practical implications**

The findings can support retail supply chain managers that deal with high fit uncertainty products, such as shoes and apparel, by demonstrating how pre-purchase fit information mitigates fit uncertainty, and thus logistics costs.

#### **Original/value**

This paper is a first attempt at evaluating digital product fitting's effect on product returns.

*Keywords:* Digital product fitting, Retail supply chains, Product returns, Return reasons, Retailing, Fit uncertainty, 3D scanning, Product recommendation system.

# SALES AND OPERATIONS EXECUTION: AN EXPLORATIVE STUDY ON POTENTIAL EFFECTS

#### Joakim Andersson Patrik Jonsson Hafez Shurrab

### ABSTRACT

#### Purpose

Sales and operations planning have a long history in practice and has been researched extensively. It has been proposed that this tactical concept needs to be aligned with a more operational, short-term concept, hence the purpose of this paper is to investigate how sales and operations execution (S&OE) can enhance the performance of a supply chain by analyzing contingency factors regarding design and use.

#### Methodology

A multiple-case study approach investigates the potential outcome of implementing a S&OE process in various contexts. Empirical data from several firms in various industries are analyzed according to common and unique factors affecting the potential result.

#### Findings

This study identifies critical design for an S&OE process to have a positive outcome in different contexts. Furthermore, relevant data is identified, as well as actors essential for successful usage. Finally, we present, by using knowledge management theory, the importance of integrating S&OE in the planning hierarchy and how the S&OE practice leads to results.

#### **Research implications**

This study details the understanding of how sales and operations execution affects the supply chain performance, given different contextual aspects.

#### **Practical implications**

This study shows the potential impact of implementing S&OE for different types of businesses, as well as giving guiding principles for its design.

#### **Original/value**

S&OE as a concept is today merely described as white papers and consultancy reports. To our best knowledge, this is the first academic study that explores the sales and execution phenomenon in a real-world context.

Keywords: Sales and operations execution, Sales and operations planning, Supply chain execution, Case study, Contingency theory, Knowledge management theory.

# LEAD TIME IN HUMANITARIAN LOGISTICS PREPAREDNESS DECISIONS BASED ON CLIMATE FORECASTS

Qifeng Yan Minchul Sohn Gyöngyi Kovács

### ABSTRACT

#### Purpose

Climate information is increasingly used to prepare for and increase the resilience to the natural hazards. However, adoption of climate forecast and its standard operating procedures for humanitarian logistics preparedness is limited. This paper aims to provide a deeper insight into the information flow, actions and decisions of humanitarian logistics preparedness based on climate forecasts.

#### Design/methodology/approach

Given that the available academic literature is scarce, the paper is based on organization reports and policy documents. A conventional content analysis is conducted to review and analyze the documents.

#### Findings

The process of humanitarian preparedness based on climate forecasts is mapped. A particular focus is placed on lead times for logistics preparedness decisions, and especially to distinguish two different interpretations of the term "lead time". Lead times are crucial in mobilizing disaster relief, concerning the mobilization of funding, the procurement and prepositioning of items, setting up distribution systems, and deploying staffs and materials to potential disaster areas before infrastructure being destructed.

#### **Research limitations/implications**

The paper identifies the research gaps and provides a research agenda for further studies. Findings of the paper can be further crossed / validated with empirical data.

#### Original/value

The study helps humanitarian organizations better understand how to employ climate information more actively in humanitarian logistics preparedness by considering implications of lead time and subsequent effects on the potential risk mitigation.

*Keywords:* Humanitarian logistics, Logistics preparedness, Natural hazards, Climate forecasts, Disaster management.

# THE MEANING OF POLICY DOCUMENTS IN BUS TRANSPORT SERVICES

#### Panagiota Tsaxiri Helene Lidestam

## ABSTRACT

#### Purpose

The purpose of the paper is to examine how policy documents regarding buses have been used in public transport in Sweden over a period of two years, and to examine which kinds of additions, exceptions and clarifications public transport authorities (PTAs) have made and why.

#### Design/methodology/approach

The main method was a content analysis of procurement documents over a period of two years. In addition, three interviews with experts from the area have been conducted to further examine the reasons behind the additions, exceptions and clarifications.

#### Findings

The findings from the analysis of the procurement documents showed, that PTAs use policy documents to construct traffic to a very large extent. However, the policy documents are still perceived as too general and this means that PTAs felt a need to modify the recommendations and the main reason according to interviewees is because the marketing departments want to promote the PTAs in an exclusive way.

#### **Research limitations/implications**

A direction for future research is to investigate historical use of similar policy documents in order to identify trends, together with interviews with experts to catch their perspective and identify the reasons of these changes.

#### **Practical implications**

The results can be used by the industry organizations on the policy documents development and in the decision making by PTAs for providing a better tendering process in the future.

#### **Original/value**

The study highlights the extended use of policy documents and the kinds of additions, exceptions and clarifications that PTAs have done. The results are of value for the industry as a whole and foremost for the transport organisations regarding the procurement documents' design.

Keywords: Bus transport, Policy documents, Public transport, Standards, Swedish conditions

# **RELATIONAL EVOLUTION:** COMMITMENT AS A SUPER-ORDINATE ENABLER OF VALUE CREATION

Stanley Fawcett Amydee Fawcett Scott Webb Sebastian Brockhaus Michael Knemeyer

### ABSTRACT

#### Purpose

Despite 30 years of focus on supply chain collaboration, companies continue to struggle to achieve relational advantage. This research explores the role of managerial commitment on collaborative transformation.

#### Design/methodology/approach

To better understand why some companies learn how to collaborate for competitive advantage and others don't, we employed a longitudinal inductive study, interviewing companies with reputations for intense supply chain collaboration at four different times over 20 years.

#### Findings

We identified managerial commitment as a super-ordinate enabler, encountering three levels of commitment: Instrumental, Normative, and Transformative. We document key antecedents and outcomes of each type of commitment.

#### **Research implications**

Theory regarding the antecedents to commitment to relational capability are underdeveloped. We elaborate these antecedents and the dynamics that undermine commitment to collaboration.

#### **Practical implications**

We provide insight into the process through which companies cultivate commitment to collaboration, which we identify as a super-ordinate antecedent of value co-creation.

#### **Original/value**

Collaboration is critical to value co-creation, risk mitigation, and lasting sustainability efforts. We elaborate a theory of collaborative dynamics that explains why most companies never go beyond superficial levels of collaboration. At the same time, we provide a roadmap for deep, transformative collaboration.

Keywords: Collaboration, Managerial Commitment, Inductive Methods.

# Supply Chain Complexity: Uneasy Fact of Life or Competitive Weapon

Markus Gershberger Stanley Fawcett Melanie Hinterplattner Amydee Fawcett

# ABSTRACT

#### Purpose

Complexity has been called the twenty-first century supply chain challenge. Most supply chain managers view complexity as a necessary evil, something to be tolerated as a fact of life. Anecdotal evidence, however, suggests companies can leverage complexity for competitive advantage. This research explores the link between supply chain complexity and competitiveness.

#### Design/methodology/approach

To better understand why and how companies pursue distinct supply chain complexity strategies, we employed an inductive study of ten leading European manufacturers.

#### Findings

Managers almost universally view supply chain complexity as "an uneasy fact of life." More telling, they perceive complexity as a major constraint on effective operations. They argue complexity raises costs and causes major headaches. Yet, proactively managing complexity is not a strategic priority at many organizations. At other companies, great effort and investment is targeted at reducing complexity. At a few select companies, complexity is leveraged for competitive advantage. We explain why and how companies develop these distinct supply chain complexity strategies.

#### **Research limitations/implications**

Despite extensive research on the sources and types of complexity, the nature of supply chain complexity continues to be poorly understood. The result: Companies either ignore complexity or seek to rationalize it out of their supply chains. We elaborate on how a more nuanced approach can yield a competitive edge.

#### **Practical implications**

A more holistic understanding of supply chain complexity promises to reduce the costs of managing complexity even as it provides insight into how a company can leverage complexity to better meet customer needs.

#### **Original/value**

We demystify complexity, providing the visibility to distinguish between good and bad complexity.

Keywords: Complexity, Good versus Bad, Inductive Methods.

# (MIS)ALIGNMENT IN RETURNS MANAGEMENT INTEGRATION OF PROCESS, POLICY AND BUSINESS INTENT

Stefan Karlsson Daniel Hellström Pejvak Oghazi Klas Hjort

## ABSTRACT

#### Purpose

The purpose of this research is to shed light on the formulation of returns management strategies and identify key returns management components to be considered when developing effective returns management strategies.

#### Design/methodology/approach

A multiple confirmatory case study of six retailers operating in online commerce was carried out. Interviews with 15 managers formed the primary empirical data source for the study.

#### Findings

The results confirm the presence of alignment in establishing effective strategies for managing product returns and suggest that return policy and process should not be viewed as isolated components, but instead as integrated and in harmony with overall business intent. The findings provide detail insights into seven existing misalignments that restrain the level of alignment. These serve as strategic elements for managers to consider on how to formulate returns management strategies and goals.

#### **Research limitations/implications**

The research provides propositions and a theoretical framework for future studies to further test and build on.

#### **Practical implications**

The results may assist retail and supply chain professionals in their quest to develop effective strategies for managing product returns.

#### **Original/value**

Research on returns management strategy is scarce. This study offers a conceptual framework and provides new empirical insights into returns management strategy formulation, and in particular potential misalignments.

*Keywords: Reverse logistics, Retail, Case study, Consumer returns, Gatekeeping, Avoidance, Supply chain orientation.* 

# THE POWER OF NUDGING

### HOW REVERSE LOGISTIC ACTIVITIES CAN CONTRIBUTE TO IMPROVED RECYCLING RATES

#### Bente Flygansvær Asta Gjetø Samuelsen Rebecka Våge Støyle

#### ABSTRACT

#### Purpose

The purpose of this paper is to investigate how reverse logistic activities can contribute to improve recycling behavior. Reverse logistic activities plays an important role in keeping resources in the circular system. However, when experience show that recycling rates is frequently too low, collection capacity is underutilized. In addition, material resources are lost when the end-consumer behavior is not satisfactory taking the role as suppliers in systems. Further research is necessary to investigate and understand this effect, known as the intention-action gap, and contribute to increasing sustainability in closing material loops.

#### Design/methodology/approach

A conceptual framework of recycling behavior is developed, and tested empirically using a two-group dependent post-test quasi-experimental design. The empirical setting is household waste collection, in a high-rise housing cooperative in an urban residential district. Three interventions, or nudges, are tested. 1) Informational nudge to improve motivation through activation of social norms. 2) System nudge through reduced distance. 3) System nudge through access to equipment.

#### Findings

Results show improved recycling behavior for the experimental group. 17% more food waste recycled, 29% less glass and metal disposed of in residual waste, and less contamination within recycled fractions. Control group behavior stayed constant. Intentions to recycle are similar between the two groups.

#### **Research limitations/implications**

The paper demonstrate how adapting reverse logistic activities can contribute to increasing sustainability in collection systems.

#### **Practical implications**

The managerial implications include demonstration of how small practical measures, like our nudges, can contribute to improved performance.

#### **Social implications**

Waste collection is an important environmental measure. Finding ways to improve these systems increase sustainability and triple bottom line performance.

#### **Original/value**

Reverse logistic activities are used in a new field of consumer behavior, which is an important interface in the research agenda of circular economy.

*Keywords: reverse logistic activities, recycling behavior, nudging, household waste, sustainability, experiment.* 

# A decision model for re-engaging End-of-Life products into the forward supply chain

#### Sayed Mohammad Ayati \* Jonas Nygaard \*\*a, b Jesper Hemdrup Kristensen\*\*\* Brian Vejrum Wæhrens\*\*\*\*

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# ABSTRACT

#### Purpose

This paper proposes a decision-making model for understanding how to utilize recovery options for retaining the value of end-of-life (EoL) mechanical products at the component level.

#### Design/methodology/approach

The holistic decision model is validated in a case study from the discrete manufacturing industry. The developed decision model highlights the characteristics, requirements, and advantages of recovery options in terms of environmental and economic performance criteria, as well as the contextual conditions, are affecting the decisions.

#### Findings

The model can guide the original equipment manufacturer (OEM) in retaining value while considering environmental impact. Significantly, the inclusion of a reusability index and the remaining useful life of EoL products are drivers for maximizing the retainable values of EoL and minimizing the take-back cost.

#### **Research limitations/implications**

The method quantifies the reusability index to implicate circularity. The absence of an appropriate method to collect data limited the research to consider several factors in the cost function modeling.

#### **Practical implications**

The proposed approach motivates the OEM to consider circularity and take-back initiatives. The case study demonstrates the complexity and challenges of EoL take-back. The model concentrates on retaining values while reducing the environmental impact.

#### Original/value

The authors collect the best practices within decision models for product take-back. They are the first to combine these practices, with the acknowledgment that conditions and values are unique and found at the component level.

Keywords: circular economy, sustainability, reverse supply chain, end-of-life, discrete manufacturing, recovery value, take-back initiative.

# SUPPLY CHAIN MANAGEMENT FOR SUSTAINABLE PACKAGING AND DISTRIBUTION

### Using Oxyhydrogen reactors in Mexico

Marisol Rico Cortez Elvira Kaneberg Ruiz Rosa Gonzalez Huerta Juan Manuel Sandoval Pineda

### ABSTRACT

#### Purpose

This study explores how processes in Supply Chain Management (SCM) can serve the use of alternative energy that helps reduce CO2 emissions. The study focuses on hydrogen as a complementary fuel alternative for maritime transportation in Mexico. Specifically, the focus is on the packaging and distribution of Oxyhydrogen Reactors that can be used permitting sustainable operations by reducing the environmental impacts and enhancing economic performances.

Using hydrogen as a fuel is thus an inspiring challenge for emerging economies, such as Mexico. Thus, Model ECS-002, an oxyhydrogen gas reactor, was designed to create a fuelsaving system called Oxhidrog®. When installed in marine vessels, this reactor could help not only reduce fuel consumption but also decrease the emission of polluting gases. Electrolysis is used to disassociate the water molecule and obtain hydrogen energy (Sastre, 2010). Oxyhydrogen reactors need to be packaged and distributed using a clean process. The production considered in this study corresponds to the prototype reactor model previously developed. Accordingly, this study focuses on the packaging and distribution of hydrogen devices. Moving beyond the typical study of individual environmental technologies, we explore logistics firms in SCM that have operations related to packaging and distribution. Most importantly, we consider logistics firms that are concerned with the different dimensions of sustainability, i.e., the society, environment, and economy.

#### **Original/value**

Oxyhydrogen Reactors were established useful to allow the use of hydrogen as alternative fuel within maritime transportation in Mexico. Allowing a scale use of hydrogen, learning from SCM should be considered when relating to its packaging and distribution, including further stages of environmental and economic performance, as well as, technology for other uses than maritime transportation. The research will also allow us to review the role of SCM in adaptation for climate changes, and their economic performances in corrupted, and underdeveloped regulations.

Keywords: Supply Chain Management, Sustainability, Logistics, Packaging Distribution Maritime Transportation, Hydrogen

# Fostering the integration of Inland Waterway Transport in intermodal logistics chains

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### ABSTRACT

#### Purpose

A recent study by the European Commission on EU and Waterway Transport shows that the growth potential of Inland Waterway Transport (IWT) is substantial, especially in container transportation if policy measures are supportive: improvement of infrastructure and ICT systems, multimodality training, better coordination in the container chain and internalization of external costs. Respective approaches are expected to benefit in many different ways.

#### Design/methodology/approach

Well known issues in IWT are inefficient navigation and traffic management combined with the poor integration in multimodal logistics processes, which add to the burden of the increased administrative costs for complying with legislation. Digitalisation of the IWT sector, improvement of interoperability across supply chains, and the implementation of automation technologies are key factors to be addressed. The paper presents the recently started H2020 project IW-NET, which aims to support IWT by addressing five key priorities; sustainable infrastructure adjustments, environmental friendliness and competitiveness of vessel fleet as well as digitalization and integration of IWT in multimodal transport chains.

#### Findings

The paper will present the methodology and goals of the project, which base on past projects like SELIS (H2020). Findings from those projects which form the basis of IW-NET will be presented as well.

#### **Practical implications**

IW-NET will support the integration of IWT to multimodal logistics chains, so as to become a quality mode of transport, targeting innovations, infrastructures, market drive, environment, and workforce.

#### **Social implications**

The exploitation of IWT is regarded as an important pre-requisite to help meet the EC's target of reduction by two-thirds in greenhouse gas emission from transportation by 2050. This is reflected by the fact that energy consumption per tonne-kilometre for transported goods by inland waterway transportation only amounts to one fifth of that of road transport and only half the consumption of rail transport

#### **Original/value**

The paper presents an advanced approach of integrating IWT in multimodal logistics chains, thereby fostering digitalization and other innovative concepts. By combining existing approaches and initiatives with new advances, positive effects on the competitiveness and environmental friendliness of respective intermodal transport chains will be realized. *Keywords: Inland Waterway Transport, Inland Navigation, multimodal transport chains.*