Book of Abstracts

19th International Logistics and Supply Chain Congress

"Humanitarian Logistics and Supply Chain Management"

October 21-22, 2021
Virtual Event

LMSCM2021

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Program at a Glance (First day)

LMSCM2021 19th International Logistics and Supply Chain Congress, Gaziantep University
Scientific Program (Virtual Conference)

Day#1	Session	Time (TRT)	General Room				
21 October 2021 / Thursday			**Opening Ceremony** Arif ÖZAYDIN (GAUN-Rector) Türkay DERELİ (HKU-Rector) Mehmet TANYAŞ (LODER-President) Eren ÖZCEYLAN (Congress Chair)				
		10:20-10:30	**Short Break**				
	Session 2	10:35-11:05	**Keynote Speaker:** Burcu Balçık "The Impact of Stock Sharing and Postponement Strategies on Prepositioned Relief Stocks"				
		11:10-11:25	**Keynote Speaker:** Maciej Szymczak "Supply Chain Resilience: Bottlenecks & Core Capacities"				
		11:30-12:00	**Keynote Speaker:** Gülçin Büyüközkan "Lojistik ve TZY'de Yapay Zeka Uygulamaları"				
		12:00-13:00	**Long Break**				
	Session 3		**Room1**	**Room2**	**Room3**	**Room4**	**Room5**
			The Impact of COVID-19 on Logistics and SCM **Session Chair: Savaş Selahattin ATEŞ**	**Vehicle Routing** **Session Chair: Mehmet SOYSAL**	**MCDM in Logistics and SCM** **Session Chair: Ayhan DEMİRCİ**	**Humanitarian Logistics** **Session Chair: Onur KAYA**	**Green Issues in Logistics and SCM** **Session Chair: Aşkıner GÜNGÖR**
		13:00-13:20	Security Control Process Modeling During the COVID-19 Pandemic: Example of Esenboğa Airport Emre KARŞIGİL-Savaş Selahattin ATEŞ	A Simulated Annealing Algorithm for the Traveling Salesman Problem with Drone under Recharging Policy Emine EŞ YÜREK	Humanitarian Aid Warehouse Location Selection by using Multi-Criteria Decision-Making Techniques Ayhan DEMİRCİ-Gökçe MANAVGAT	Capability-Based Location and Resource Planning for Post-Disaster Emergency Medical Services Mehmet Kursat OKSUZ-Sule Itır SATOĞLU-Nezih ALTAY	Estimation of Electronic Waste (E-Waste) for Designing Reverse and Closed Supply Chain Zeynep ÖZSÜT BOĞAR-Aşkıner GÜNGÖR
		13:25-13:45	Assessment of Factors Affecting Supplier Selection during Coronavirus Pandemic for a Cosmetic and Cleaning Products Manufacturer Pınar KOCABEY ÇİFTÇİ	New Meta-heuristic Approach for Solving the VRPTW in Supply Chain Management Nesrine BIDANI- Hela MOALLA FRIKHA-Adnan YASSINE	Evaluation of Indicators Affecting the Performance of Bonded Warehouses by the Analytical Hierarchy Process Aynur ACER	Locating Mobile and Permanent Logistics Depots in Earthquake Prone Regions Zafer YILMAZ-Jan Ridade GERGİN	Simulation Based Reverse Supply Chain Network Design for WEEE Leyla Özgür POLAT-Aşkıner GÜNGÖR
		13:50-14:10	Use of Check-in Self Service Technologies before and during the COVID-19 Pandemic: Example of Esenboga Airport Niyazi Cem GÜRSOY-Savaş Selahattin ATEŞ	A Dynamic Vehicle Allocation Problem with Rolling Horizon Framework Damla BENLİ-Mehmet SOYSAL-Merve İBİŞ	Sustainable Agri-Food Supply Chain Design with a QFD-ANP Hybrid Model Emre YAVUZ-Mehmet TANYAŞ	New Methods for Connectivity of Critical Nodes for Post Disaster Management İlknur TÜKENMEZ-Tuğba SARAÇ- Onur KAYA	Carbon Reduction Scenarios in Highway and Its Relationship with Public Health Durcan Özgün SARIOĞLU-Didem EVCİ KİRAZ
		14:15-14:35	The Impact of the Measures Taken Under COVID-19 on Aircraft Delays Ayberk TUTKUN-Savaş Selahattin ATEŞ	Approach of a B2B Distribution Network Optimization as Vehicle Routing Problem Solving As a VRP Limit Time in Last Customer David Camacho Fonseca	Locating Cell on Wheels in Emergency Using Fuzzy COCOSO and Weighted Minimax Methods Esra ÇAKIR- Mehmet Ali TAŞ-Ziya ULUKAN	Strategy Evaluation for Emergency Logistics Management of Disasters Merve GÜLER-Esin MUKUL-Gülçin BÜYÜKÖZKAN	A Circular Economy Based Approach for Supplier Selection in Agri-Food Supply Chains Gülçin BÜYÜKÖZKAN - Deniz UZTÜRK
		14:35-14:50	**Short Break**				
	Session 4		**Room1**	**Room2**	**Room3**	**Room4**	**Room5**
			Green Issues in Logistics and SCM **Session Chair: Abdullah Oktay DÜNDAR**	**Humanitarian Logistics** **Session Chair: Ümit ÇELEBİ**	**Innovative and Smart Technologies in Logistics** **Session Chair: Gökhan AKANDERE**	**Vehicle Routing** **Session Chair: Çağrı KOÇ**	**The Impact of COVID-19 on Logistics and SCM** **Session Chair: Z. Vildan SERİN**
		14:50-15:10	Factors Affecting Green Logistics Policies and Their Effects on Logistics Performance Index: Comparison of the European Union and Turkey Abdurrahim Furkan MERCİMEK-Abdullah Oktay DÜNDAR	A Literature Review on Supply Chain Studies about Earthquakes Ahmet AKTAŞ-Mehmet KABAK	The Impact of Logistics Innovativeness on Perceived Organizational Performance: Application in the Logistics Industry Karahan KARA	An Application of Mobile Healthcare Service Routing and Scheduling Problem in Ankara İlhami AKKUŞ-Ece Arzu YILDIZ-İsmail KARAOĞLAN-Fulya ALTIPARMAK	COVID-19 Vaccine Logistics: Analysis According to Countries Level of Development Z. Vildan SERİN - Oya ÖZTÜRK
		15:15-15:35	Green Logistics Practices in Aviation Industry: A Research on Antalya Airport Ayşegül TOY-Abdullah Oktay DÜNDAR	The Effect of Trade Costs upon Human Development: Mediating Role of Logistics Performance in Confronting Humanitarian Crisis Ümit ÇELEBİ	Parcel Lockers as the Last Mile Delivery Innovation: A Systematic Literature Review Halil KARLI-Mehmet TANYAŞ	Lean Transportation Management through an Application of Vehicle Routing Planning: A Case Study Nattapong KONGPRASERT-Chichakorn DURIYARAPEE-Watcharain LARPTRAKOOL	Sustaining a Resilience of Competitive Advantage during COVID-19 in Maritime Supply Chains: From Perspective of Resource-Based Theory Kazım YENİ-Sedat BAŞTUĞ
		15:40-16:00	Analysis of Green Supply Chains in Accordance with Environmental Sustainability Criteria Mehmet Ali TAŞ-Serap AKCAN	The Concept of Agility in Humanitarian Logistics Gülşah ŞİŞMAN-Fatma DEMİRCİ OREL	The Effect of Digitalization Level and Smart Logistics Practices on Logistics Performance Gökhan AKANDERE	Home Health Care and Dialysis Routing With Electric Vehicles and Public Charging Stations Çağrı KOÇ - Mehmet ERDEM	Impact of COVID-19 Pandemic on Air Transportation Industry Sercan DEMİR-Ersin AKTAŞ-Turan PAKSOY
		16:05-16:25	The Effects of EU Green Agreement to the Turkish Logistics Sector Emre İPEKÇİ-Mehmet TANYAŞ		Location and Routing Assessment on Parcel Lockers, Methods and Key Aspects: A Literature Review Kutay AKDOĞAN-Eren ÖZCEYLAN	A Dynamic Programming Approach for Multi-Period Vehicle Allocation Problems Damla BENLİ-Mustafa ÇİMEN-Merve İBİŞ	Search for Optimum Urban Parcel Delivery Systems in COVID-19 Pandemic Crisis Mucahit SİSLİOĞLU

Program at a Glance (Second day)

Day#2	Session	Time	Room1	Room2	Room3	Room4	Room5
22 October 2021 / Friday	Session 5		**Mathematical Modelling** **Session Chair: Serap ULUSAM SEÇKİNER**	**Smart Applications** **Session Chair: Emel YONTAR**	**Operations Management** **Session Chair: Mustafa ÇİMEN**	**Sustainability** **Session Chair: Olcay POLAT**	**Forecasting and Performance Analysis** **Session Chair: Gülçin CANBULUT**
		09:00-09:20	Determination of Railway Network by Hierarchical Maximal Covering Problem in Turkey Metehan ATAY-Serap ULUSAM SEÇKİNER-Eren ÖZCEYLAN	Blockchain's Potential for Waste Management in Textile Sector Elif DURSUN-Yasemin ÜLKER-Yavuz GÜNALAY	A Scoping Review of the Lot Sizing Problem with Multiple Items, Multiple Periods and Multiple Suppliers Matheus ALLGAIER-Luiz Felipe SCAVARDA-Andréa Regina Nunes de CARVALHO- Fernanda Ruffo TERCERO	Determination of Sustainable Urban Logistics Performance Index (SULPI) Rabia Sude ÖZTÜRK-Olcay POLAT-Aşkıner GÜNGÖR	Demand Forecasting in Retail: A Machine Learning Based Approach for Accurate Short-Term Forecasts Mehmet Mustafa ÖZALP-Özgür AKARSU
		09:25-09:45	A Comparative Study for the Maximum Flow Problem arising at Road Networks in Kota Kinabalu Şeyme SAFADİ-Alptekin DURMUŞOĞLU-Eren ÖZCEYLAN	Blockchain Applications for Traceability and Food Safety in Agri-Food Supply Chains Mehmet TANYAŞ-Şebnem İNDAP	Cost-Effective Optimization Model for Import Operations via Maritime Transportation Emre ÇAKMAK-Onur AYDIN-Pınar GÜROL	Smart Solutions for Sustainable Urban Logistics: A QFD Approach Öykü ILICAK-Gülçin BÜYÜKÖZKAN-Orhan FEYZİOĞLU	An Application to Forecasting of a Hospital's Energy Consumption and Reducing Imbalances Costs Aylin OZAN-Seren ÖZMEHMET TAŞAN
		09:50-10:10	Geographic Information Systems-Based Mathematical Modeling Approach for Biomass Supply Chain Network Design Ahmet Alp ŞENOCAK - Hacer Guner GÖREN	Analysis of Blockchain Applications in Sustainable Logistics Management Emel YONTAR	An Optimization Approach to Position Demand Driven MRP (DDMRP) Buffers in a Make-To-Order Environment in Bill-Of-Materials by Considering Variants Ahmet BALCIOĞLU-Mehmet TANYAŞ	Artificial Intelligence and Sustainable Supply Chain Finance in Omni-Channel Logistics Monika BAL-Kinga PAWLICKA	Analysis of Fuzzy Supply Chain Performance Based on Quantity Flexibility Contract Gülçin CANBULUT
		10:15-10:35	A Mixed Integer Programming Model for Supply Chain Network Design in a Net Present Value Perspective Rahmi BAKİ	Digitalization Barriers of Logistic Operation: A Systematic Review and Framework Development Kevser YILMAZ-Aşkın ÖZDAĞOĞLU	A Restricted Dynamic Programming Approach for Solving Stochastic Lot-Sizing Problems Mustafa ÇİMEN	Exploring the Sustainable Supply Chain Integration: A Case Study of Dogus Group Yasemin ÜLKER-Banu DEMİREL	The Journey of Antep Pistachio Supply Chain Mehmet Rıfat ULU - Eren ÖZCEYLAN
		10:35-10:50	**Short Break**				
	Session 6		**Room1**	**Room2**	**Room3**	**Room4**	**Room5**
			MCDM in Logistics and SCM **Session Chair: Yunus KAYMAZ**	**Innovations in Logistics and SCM** **Session Chair: Göknur Arzu AKYÜZ**	**The Impact of COVID-19 on Logistics and SCM** **Session Chair: Batuhan KOCAOĞLU**	**Operations Management** **Session Chair: Özgür YALÇINKAYA**	**Logistics and SC Optimization** **Session Chair: Beste DESTECİOĞLU**
		10:50-11:10	SWARA – WASPAS Hybrid Approach for the Evaluation of Courier Companies in Turkey Billur ECER	Big Data: The Future of the Logistics Industry in Turkey Faruk TAŞKIRAN	The Impact of COVID-19 on E-Commerce: A Study of Supply Chain Network and Cargo Transportation Muhammet Mustafa AKKAN-Tufan YAYLA	A Genetic Algorithm Integrated Simulation Optimization Approach for Scheduling of a Real Bus Shuttle System Doğan Can GÖKMEN-Özgür YALÇINKAYA	A Time-Variant Capacitated Facility Location and Network Design Problem for Wastewater Treatment Systems Seyda Alperen PEHLİVAN-Duygun Fatih DEMİREL-Sıdıka Melek BAŞAK
		11:15-11:35	Multi-Criteria Decision Making Approaches for Warehouse Layout and Design: A Literature Survey Şakire Nesli DEMİRCİOĞLU-Eren ÖZCEYLAN	A New Era in Marketing: Facial Recognition Payment in Retail Industry Sercan DEMİR-Ersin AKTAŞ-Turan PAKSOY	A Linear Programming Approach Example on Converting Passenger Aircraft into a Freighter (P2f) During COVID-19 Pandemic Ayşe Seçil BAŞER-Batuhan KOCAOĞLU	A Literature Review on Train Scheduling Problem: From 2010 to 2020 Mustafa AKDEMİR-Özgür YALÇINKAYA	Latest Optimization Approaches for Biogas Supply Chain Management: A Literature Survey Serpil EROL-Gürkan Güven GÜNER
		11:40-12:00	The Selection of Dry Port Locations Using PROMETHEE Yunus KAYMAZ-Ural Gökay ÇİÇEKLİ	Smart Ecosystems in Supply Chain Management Goknur Arzu AKYÜZ-Dursun BALKAN	Analyzing the OHS Risks Emerged in Transportation of Medical Materials in the COVID-19 Pandemic Aylin ADEM-Burcu YILMAZ KAYA-Metin DAĞDEVİREN	Improvement of the Production Efficiency with Lean Manufacturing Techniques Eray TÜRKMEN-Elif TUYAN-Orhun GÖKDEMİR-Majed ALKHATIB-Kübra Nur ŞAHİN-İsmet SÖYLEMEZ	Determining Suitable Routes for Vaccine Distribution to Hospitals: Application of Ankara Province Beste DESTECİOĞLU-Kemal Gürol KURTAY-Aygün ALTUNDAŞ-Hakan Ayhan DAĞISTANLI
		12.05-12:25	Analyzing the Potential Locations of a Dry Port in Gaziantep Region Ayca ÖZCEYLAN-Mehmet TANYAŞ	Robotic Process Automation in Supply Chain Management Gökhan KIRBAÇ	Humanitarian Supply Chains and COVID-19: Systems Failures and Recovery Claire TRAVERS	The Role and Importance of Outsourcing in Logistics Enterprises Şuayip ÖZDEMİR-Tuğrul BAYAT-Betül KOCATÜRK	Supply Chain Risk Management: A Literature Review on Definition, Theory, and the Role of Simulation and Existing Optimization Methods Gizem TOPÇU-Oğuzhan ÇAĞIL-Yasutay SUSOY-Banu ÇALIŞ USLU
		12:25-12:40	**Short Break**				
	Session 7		**General Room**				
		12:40-13:10	**Keynote Speaker:** Tolga Bektaş "Last-Mile Logistics in London"				
		13:15-13:45	**Keynote Speaker:** Kannan Govindan "Sustainable and Resilient Reverse Logistics Network Design"				
		13:50-14:00	**Short Break**				
	Session 8		**Room1**	**Room2**	**Room3**	**Room4**	**Room5**
			Supplier Selection **Session Chair: Özgür ÖZPEYNİRCİ**	**The Impact of COVID-19 on Logistics and SCM** **Session Chair: Nurcan DENİZ**	**MCDM in Logistics and SCM** **Session Chair: İskender PEKER**	**Logistics and SC Policies** **Session Chair: Aslı ÖZPOLAT**	**Aviation Logistics** **Session Chair: Turan PAKSOY**
		14:00-14:20	An Analysis of Decision Makers' Preferences through Supplier Selection Problem Sinem TAŞBAŞI - Özgür ÖZPEYNİRCİ	Supply Planning Based on the Analysis of COVID-19 Data Elif AKBULUT-Volkan USLAN	Criteria Prioritization for Allocation of Electric Vehicle Charging Stations by Group Decision Making Based Intuitionistic Fuzzy AHP Approach Mehmet Hanifi AYDIN-Mücahid GÜNAY	The Nexus between the Logistics Sector and Climate Change: An Empirical Study for Newly Industrialized Countries Aslı ÖZPOLAT	Improving Services with Augmented Reality in Airports: Facilitating Airport Navigation and Improving Customer Service Sercan DEMİR-Ersin AKTAŞ-Turan PAKSOY
		14:25-14:45	Evaluation of Supplier Selection Criteria in the Marble Sector through the DEMATEL Method Tuğrul BAYAT - Önder İNCE-Betül KOCATÜRK	How Lean Thinking Help to Solve COVID-19 Related Problems? - A Lean Patient Experience Map Nurcan DENİZ	Multi-Criteria Assessment Framework for Freight Villages Based on Operational Efficiency Criteria Burcu YILMAZ KAYA-Aylin ADEM-Metin DAĞDEVİREN	Europe's New Trade Door Opening to Asia: Nakhchivan Corridor Tufan YAYLA- Sinan ÇİZMECİOĞLU	Suborbital Space Tourism Enes DEMİRALAY-Engin Hasan ÇOPUR-Turan PAKSOY
		14:50-15:10	An Integrated Supplier Selection Model Considering Risk Criteria in the Tire Industry Elif Sena KUTLU-Merve ER	Use of Autonomous Technologies in Airport Check-in Process in Pre- and Post-COVID-19: Ankara Esenboga Airport Example Erkam Emin AYVAZ-Savaş Selahattin ATEŞ	Prioritizing the Barriers of Sustainable Supply Chain Management by Best-Worst Method Mehmet Zahit HANZADE-İskender PEKER-A.Cansu GÖK KISA	Importance of Bicycle Transport within EU Climate Change Policies and Inferences for Turkey Fatıma Zehra ZENGİN-Senay OĞUZTİMUR	Making the Shift to a New Paradigm of Logistics Management: Space Logistics Enes DEMİRALAY-Engin Hasan ÇOPUR-Turan PAKSOY
		15:15-15:35	The Impact of Supply Chain Disclosure on Supplier Sustainability: A Qualitative Analysis in the Textile Industry Melek AKIN ATEŞ	Analysis of Threat in Global Supply Chains Creating Logistics Barriers during a Global Pandemic Zbigniew BENTYN-Sylwia KONECKA	Prioritizing Factors Affecting Green Supply Chain Management and Used Technologies with Picture Fuzzy AHP Ezgi DEMİR	Defence Industry Artificial Intelligence Applications on Warrior's Logistics Sustainment Tolga ÖZ	
		15:40-16:00	Changes in Supply Chains during the COVID-19 Pandemic Ahmet ÇETİNDAŞ	Assessment of Risk Factors in the Pharmaceutical Supply Chain for Pandemic Process Songül AKSOY-Atiye TÜMENBATUR	A Qualitative Analysis of Dangerous Goods Safety Advisor Companies in Terms of Dangerous Goods Logistics Yunus KAYMAZ		
	Session 9	16:00-16:30	Closing Ceremony				

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Paper ID: 01

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A LITERATURE REVIEW ON SUPPLY CHAIN STUDIES ABOUT EARTHQUAKES

Abstract *– Earthquakes are considered as an important type of disasters, which occur at various magnitudes on several locations around the world every day. An earthquake causes different problems for people such as damaging or destroying buildings; rupturing roads, tunnels and pipelines; tsunamis and fires. So, preparation of emergency plans for earthquakes is extremely important. Development of these plans is strongly related to disaster management and humanitarian logistics concepts. In this study, a literature review was conducted which presents a summary of the studies related to supply chain management and earthquakes. A number of studies have been evaluated in views of the problems considered, solution approaches and suggestions presented in these studies. Since earthquakes commonly occur in Turkey, the problems that have to be considered in the development stage of emergency plans for earthquakes and possible solution approaches can be understood from the findings of the study.*

Keywords *– Disaster management, earthquakes, humanitarian logistics, literature review, supply chain management.*

Paper ID: 02

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SWARA – WASPAS HYBRID APPROACH FOR THE EVALUTION OF COURIER COMPANIES IN TURKEY

Abstract – *Because of the restrictions and suggestions made by the government about staying at home during the COVID-19 pandemic, people started to choose online shopping in recent months. People order the goods from the producer's or one of the e-commerce web sites and the order is delivered to the customers by a courier company. Furthermore, most of the online shopping web sites provide the option of courier selection to their customers. Since the delivery of goods is a service, it is necessary to consider different effective aspects for choice of courier service provider. So, the courier selection decision must be made after a multi-criteria decision analysis. The main aim of this study is to rank the most common courier companies in Turkey for the delivery process of goods bought by online shopping. To do so, 6 courier companies were evaluated by using a hybrid methodology, in which the Step-wise Weight Assessment Ratio Analysis (SWARA) method and the Weighted Aggregated Sum Product Assessment (WASPAS) method was integrated. The results of the study would support courier selection decisions in online shopping.*

Keywords – *COVID-19 pandemic, courier selection, online shopping, SWARA, WASPAS.*

Paper ID: 06

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LATEST OPTIMIZATION APPROACHES FOR BIOGAS SUPPLY CHAIN MANAGEMENT: A LITERATURE SURVEY

Abstract *– The efficient use of renewable energy sources is very critical because of the economic reasons. Considering the extreme usage of the fossil fuels around the world, it is also very critical in terms of protecting nature and human health. The use of biogas, which is one of the significant renewable energy sources, is very common in many countries because of its wide usage areas. For example, the recovered biogas can be used for electricity, heating, and transportation fuel. The greenhouse gas (GHG) emission, which causes global climate change, can be reduced significantly by the use of biogas. The optimization of biogas supply chain is necessary to ensure the demand of biogas and biofertilizer by maximum profit and minimum environmental damage. Determining the optimal location of production and purification technologies for the biogas by considering the installation requirements is important to minimize the cost. There are many studies in the literature that try to find alternative solutions by developing different methodological approaches for the optimization of biogas supply chain. In this study, latest studies in the literature are investigated, classified and compared. It is aimed that the implemented literature survey in this study becomes a beneficial guide to develop alternative solution approaches.*

Keywords – *Biogas, supply chain optimization, survey.*

Paper ID: 11

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A QUALITATIVE ANALYSIS OF DANGEROUS GOODS SAFETY ADVISOR COMPANIES IN TERMS OF DANGEROUS GOODS LOGISTICS

Abstract *– As today, the transportation of not only daily products but also the goods referred as " dangerous" should be considered under an intense attention. This is so because, as the logistics industry faced many unfortunate events during the transportation of such kind dangerous goods. Furthermore, the there are some initiatives and political actions considered by governments in order to transport dangerous goods safely. The industry in Turkey in terms of transportation of dangerous goods can be considered quite new and the laws and regulations are also formed consequently. Thus, there are limited academic literature focusing on dangerous transportation context and there is a scarce academic literature interested in advisory companies in dangerous goods logistics. In this context, this paper includes the general environment of the industry focusing dangerous goods transportation in Turkey and also includes the advisor companies and their institutional comments on industry itself and related laws. A qualitative analysis is conducted and experts and their arguments and opinions were indicated.*

Keywords *– Dangerous goods transportation, dangerous goods logistics, dangerous goods safety advisor companies, logistics.*

Paper ID: 12

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THE SELECTION OF DRY PORT LOCATIONS USING PROMETHEE

Abstract *– In today's world when it is hard to ignore the effect of global supply chain and logistic systems on global markets, maritime transport confronts us as a type of transport that is chosen considering the amount of load and shipping fares. Ports, playing an essential role in maritime transportation, are places where goods gain added-value. The current port yards cannot be extended for ports having problems due to the increase in the number of containers with each passing day and thus there occur disruptions both in the flow of goods and in other relevant activities. These disruptions can be eliminated through some actions to be taken in dry ports. Within the scope of the present study, the literature about dry ports is reviewed and it is aimed to determine suitable dry port locations for port areas in the coastal region of Turkey by developing criteria for selection of suitable ports.*

Keywords *– Dry port, facility location selection, logistics.*

Paper ID: 14

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ANALYSING THE POTENTIAL LOCATIONS OF A DRY PORT IN GAZIANTEP REGION

Abstract *– Sea ports for logistics activities is one of the important actors in Turkey and the world. In 2019,811.2 million TEU was processed on a container basis for international maritime trade worldwide. It is important to manage this load in such busy seaports. Therefore, it is a solution to transfer the cargo waiting and other activities at the port to the dry ports in order to reduce this density. Dry ports are the connection points where the cargoes to be transported to the port by road or rail from the interior are collected. As far as is known that there is no dry ports in Gaziantep region. Thanks to the Hassa tunnel planned to be opened, the distance between Gaziantep and Iskenderun Port is expected to decrease remarkably. In this study, the dry port location selection will be made with multi-criteria decision making methodology, and recommendations that also include the required activities and process inside the dry port will be provided.*

Keywords *– Dry ports, Gaziantep, Hassa tunnel, İskenderun port, location analysis.*

Paper ID: 15

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ASSESSMENT OF RISK FACTORS IN THE PHARMACEUTICAL SUPPLY CHAIN FOR PANDEMIC PROCESS

Abstract *– The pharmaceutical industry as being the 3rd greatest sector in the world, manufactures synthetic, herbal, animal and biological chemicals used for therapeutic, protective, and diagnostic purposes in human and veterinary medicine in accordance with pharmaceutical technology. The pharmaceutical industry has also particular importance with his value-added position and is critical with his capacity in production and trade volume in the world. In the globalizing world, the pharmaceutical sector has entered into rapid growth process in recent years, with the effect of both demographic changes and increases in life expectancy and increased access to health services. The pharmaceutical supply chain is multilayered and disruptions in the chain adversely affect the delivery of services correctly and on time. Pharmaceutical logistics, which is one of the critical processes human life is in the question, has to be continuous without interruption due to the continuity of the needs of users. In this context, pharmaceuticals logistics have different characteristics than all other products logistics, and it is important to control temperature, humidity, vibration and light degrees throughout the whole chain and to record and report the results. Monitoring whether the cold chain is broken somewhere during the logistics operations carried out throughout the supply chain of the product is important in terms of directly affecting human health. In this study, the risk of the pharmaceuticals supply chain will be determined on the basis of SCOR process, and the effects of the COVID-19 epidemic, which significantly affects the global trade, on the pharmaceutical supply chain will be evaluated with a supply chain risk management approach.*

Keywords *– Pharmaceutical industry, pandemic effects, SCOR, supply chain risk management.*

Paper ID: 16

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HUMANITARIAN AID WAREHOUSE LOCATION SELECTION BY USING MULTI-CRITERIA DECISION-MAKING TECNIQUES

Abstract *– Facility location selection is important for humanitarian aid organizations, which gain importance especially in times of natural disasters. Because these facilities should be away from the natural disaster area. Facility location is a strategic decision that must be chosen correctly at the first time, cannot change later. Therefore, it must be based on a scientific approach. Multi-criteria decision-making techniques (MCDM), which have significant improvements in recent years, provide this scientific basis. In this context, a possible humanitarian aid warehouse location was selected by using MCDM including scientific approach in the selection of facility location. In the study, firstly, 10 criteria were determined by taking the expert opinion. Then, by using Data Envelopment Analysis, these 10 criteria were weighted, and then alternatives were listed by using two different MCDM, ARAS and CODAS Methods. The rank made by both methods among six different alternative area were compared and the results were discussed.*

Keywords *– ARAS method, CODAS method, data envelopment analysis, humanitarian aid, multi-criteria decision-making techniques, warehouse location.*

Paper ID: 19

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THE IMPACT OF SUPPLY CHAIN DISCLOSURE ON SUPPLIER SUSTAINABILITY: A QUALITATIVE ANALYSIS IN THE TEXTILE INDUSTRY

Abstract *– This study aims to investigate the impact of supply chain disclosure on supplier sustainability. After the unfortunate Rana Plaza event in Bangladesh and due to increasing stakeholder pressure, global textile and apparel retailers started to share more information about how they ensure sustainability in their supply chains. One of these practices is publicly sharing supplier lists, which include supplier information such as location, employee size and gender, product type and audit reports. Extant research has focused on understanding the impact of sharing supplier lists on customer buying behavior and buying firm profitability; however, the effect on supplier sustainability has not been investigated yet. This is surprising considering that the ultimate purpose of supply chain disclosure is improving supply chain sustainability. To investigate this research gap, in this study a qualitative approach is adopted, and interviews with Turkish textile firms listed in such lists are conducted. Exploratory analyses illustrate varying effects on supplier sustainability behavior as well as the barriers and enablers for these effects. Implications for theory and practice are discussed.*

Keywords *– Interview, supply chain disclosure, sustainability, textile.*

Paper ID: 20

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USE OF CHECK-IN SELF SERVICE TECHNOLOGIES BEFORE AND DURING THE COVID-19 PANDEMIC: EXAMPLE OF ESENBOGA AIRPORT

Abstract – *Check-in is the process that passengers wait for the most before their flight. Waiting times of passengers will vary depending on the number of counters at the airport, the number of self-service facilities, and whether passengers benefit from online/mobile check-in technologies. As a result of the measures taken at airports with the COVID-19 pandemic, check-in processing times have been prolonged. In this study, Esenboga airport domestic departure check-in operations are simulated with the ARENA-TRIAL simulation program. The developed scenarios were simulated at peak hours. Initially, it was determined that the number of employees and facilities should be increased to keep the service level at standards during the COVID-19 pandemic thanks to the optimum number of facilities obtained. Secondly, it was determined that the time spent by passengers for check-in processes increased significantly during the COVID-19 pandemic. In addition, it has been observed that the placement of the optimum number of self-bag drop facilities at the airport reduced the average waiting time required for the check-in processes of passengers in the period before and during COVID-19. Finally, during the COVID-19 pandemic, the airport queue density has increased dramatically.*

Keywords – *Check-in processes, COVID-19, queue, modeling, simulation.*

Paper ID: 21

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THE IMPACT OF THE MEASURES TAKEN UNDER COVID-19 ON AIRCRAFT DELAYS

Abstract *– Due to Coronavirus, which has appeared in Wuhan, China at the end of 2019 and broke out to whole of China in a very short time, and gradually to the whole world. In March 2021, Corona was considered a worldwide pandemic disease. Because of the outbreak of the virus, many procedures started to be carried on and several countries closed their borders. As a result of this situation, the air transportation sector was severely affected. While the rate of spread of the virus has increased, many measures have been published by the World Health Organization. Some of them are washing hands regularly, keeping social distance to be at least 1 meter from people who are coughing or sneezing, avoiding unnecessary travel, and avoiding crowding places. At this point, there are some measures taken by the Directorate General of Civil Aviation. One of these is restricting cabin baggage on board. Considering that speed is very important in the air transport sector, the inability of passengers to take their cabin baggage with them increased the number of baggage' in the Cargo compartment. As a result, luggage loading prolonged and started to take much time, which caused delays. In this study, the negative consequences of the increase in the number of luggage in the Cargo compartment in line with the circular issued during the pandemic period will be studied with the ARENA TRIAL simulation program.*

Keywords *– Baggage handling system, COVID-19, passenger baggage, simulation.*

Paper ID: 22

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COVID-19 VACCINE LOGISTICS: ANALYSIS ACCORDING TO COUNTRIES LEVEL OF DEVELOPMENT

Abstract *– Developing a vaccine against the COVID-19 pandemic, which has been ongoing since December 2019, has become a global goal. Large pharmaceutical companies are partnering with biotech companies, national governments and universities to accelerate the progress towards an effective vaccine. After the conclusion of these studies, the need for complex production processes and reliable distribution channels has emerged. How this production will be shared and how to provide the vaccine to the citizens of economically troubled countries is a very important problem. It is a fact that the development levels of the countries play an important role in this distribution. As of May 2021, more than 1 billion 650 million doses of vaccine have been injected to people worldwide against coronavirus. With 497 million 270 thousand doses, China became the country where the most vaccines were made. The USA with 283 million 940 thousand, India with 190 million 840 thousand, England with 59 million 800 thousand, Germany with 44 million 390 thousand, Italy with 30 million 490 thousand, Turkey with 27 million 820 thousand, Russia with 26 million 420 thousand, Indonesia with 24 million 430 followed. The purpose of this study is to analyze the relationship between the logistics of COVID-19 vaccines and the development levels of countries. In this respect, the data of vaccine logistics made to developed, developing and underdeveloped countries on the basis of countries and through international organizations will be presented and the relationship between them will be examined.*

Keywords *– COVID-19, level of development, logistics, vaccine.*

Paper ID: 23

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SECURITY CONTROL PROCESS MODELING DURING THE COVID-19 PANDEMIC: EXAMPLE OF ESENBOGA AIRPORT

Abstract *– The simulation approach reveals a more realistic system behavior analysis contrary to traditional theories. Therefore, this gains importance for passenger flow areas at airports, especially for security checkpoints. Simulation of airport security checkpoints provides a basis for using these service points more efficiently, identifying bottlenecks in the system and finding solutions. Compared to 2019, there was a 62.7% decrease in the number of passengers and a 43% decrease in the number of flights in 2020 due to the COVID-19 outbreak on a global scale. For this reason, the importance of simulation modeling has increased even more due to the capacity usage restrictions that COVID-19 measures will bring to airports. In this study, it was aimed to calculate the delay and queue data at the security control point after the passport control in Esenboga Airport after COVID-19 measures and regulations. In the study, the security control process was modeled before and after the COVID-19 pandemic using the simulation method. The simulation model was created in accordance with the actual operation, based on expert opinions gathered through semi-structured interviews. As a result of the study, the results of the simulation model were evaluated, and suggestions were made to the airport stakeholders.*

Keywords *– Airport management, airport security screening process, COVID-19, simulation.*

Paper ID: 25

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THE EFFECT OF TRADE COSTS UPON HUMAN DEVELOPMENT: MEDIATING ROLE OF LOGISTICS PERFORMANCE IN CONFRONTING HUMANITARIAN CRISIS

Abstract *– States aim a rise in trade and economic growth as part of their development programs. But the advancement in the economic and monetary indicators is not sufficient for sustainable development. Together with standard of living, human development index makes up this short fall by taking into account of non-monetary indicators such as number of years in education and life expectancy. Many factors have effects on human development amongst which trade costs and logistics performance are of critical importance. Because, countries with lower costs of trade and higher logistics performance are more likely to reach faster and more sustainable human development – while better coping with humanitarian crisis if and when taking place. The literature highlights the role of logistics performance as a significant determinant of trade costs. This study however aims to explore the mediator role of logistics performance in the relationships between trade costs and human development. By following Baron and Kenny mediation method via utilizing hierarchical regression, this study analyzed the data set of eighty partner countries of Turkey for the years 2007, 2010, 2012, 2014 and 2016. The result of the mediation analysis and the Sobel test shows that logistics performance fully mediates trade costs and human development index.*

Keywords *– Human development, logistics performance, mediating analysis, trade costs.*

Paper ID: 27

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ANALYSIS OF FUZZY SUPPLY CHAIN PERFORMANCE BASED ON QUANTITY FLEXIBILITY CONTRACT

Abstract – *In this study, a two-echelon supply chain is analyzed where the supplier sells the products to retailer, who in turn sells the product to end customers. In such an arrangement, the supplier and the retailer aim to increase their profits individually which causes double marginalization. Several studies have been proposed by researches to solve the problem of " double marginalization" and its consequences to supply chain performance. Therefore, contractual agreements as coordination mechanisms were developed to improve the supply chain performance. In the literature, many studies have been conducted on these coordination mechanisms under probabilistic demand. However, in the absence of the historical data it is not possible to establish the probability distribution. In such cases, the fuzzy set theory which is another illustration of uncertainty can be used to model the supply chain. The focus of this study is to analyze a two stage supply chain performance by using quantity flexibility contract under fuzzy demand. In the literature; there is not much work on quantity flexibility contract. Therefore, studies conducted in fuzzy environment are rarer. Because of that; in this study, supply chain contracts with fuzzy demand parameter are investigated. After, also the order quantity flexibility rate parameter is considered as fuzzy variable. In the study, initially closed form solution to the quantity flexibility contract model with fuzzy demand is proposed. After that the closed form of this model with fuzzy order quantity flexibility rate parameter. Then the purposed models are analyzed by changing the supply chain parameters.*

Keywords – *Credibility theory, fuzzy set, quantity flexibility contract, supply chain coordination.*

Paper ID: 32

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GEOGRAPHIC INFORMATION SYSTEMS-BASED MATHEMATICAL MODELLING APPROACH FOR BIOMASS SUPPLY CHAIN NETWORK DESIGN

Abstract *– Global energy demand has been increasing due to rapid growth of population and technological developments. Fossil fuels, which are primarily used to meet the demand, can cause global warming and environmental problems via greenhouse gases. Transition from fossil fuels to renewable energy sources, which are less harmful to environment, has been supported by organizations, governments, and scientists. Biomass, one of the renewable energy sources, can be obtained from agricultural and forestry residues, animal waste, municipal solid waste, energy crops, food crops, microalgae, and other once living organisms. Due to high transportation costs and volumes, effective network design of bioenergy systems is of great importance. To address the solution of biomass supply chain design problem, this study proposes an integrated approach. Firstly, suitable locations for biogas facilities have been determined using geographic information systems considering environmental, economic and social criteria. Then, the mixed integer linear programming model of biomass supply chain network has been built. The proposed method has been applied to Denizli and decisions concerning plant locations, capacities, transportation amounts, annual electricity generation and fertilizer production amounts have been made.*

Keywords *– Biomass, logistics, network design, renewable energy, supply chain.*

Paper ID: 38

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EVALUATION OF INDICATORS AFFECTING THE PERFORMANCE OF BONDED WAREHOUSES BY THE ANALYTICAL HIERARCHY PROCESS

Abstract *– Bonded warehouses defined as " the bonded areas where the goods are protected under appropriate conditions, their quantity, quality and characteristics are examined, their values are determined" in the relevant article of the Customs Law No. 4458 and the regulation serve as the intermediate points for international trade transactions. In today's world where competition is increasing rapidly, efficiency measurement is an important indicator in the performance evaluation of businesses operating in different sectors. Every business company wants to use its resources in the most optimal way to achieve different and better goals than the previous year. Performance indicators used in the determination of the efficiency and productivity of businesses are also important for the future of bonded warehouses. This study aims to determine the quantitative criteria used in the evaluation of the efficiency of the bonded warehouses and to evaluate the efficiency of the warehouses according to these criteria. In the study, first, the key performance indicators that determine the performance of the bonded warehouses were detected. These indicators determined by reviewing the relevant literature and expert opinions, are as follows: total bonded area (open and closed area), total number of ramps, total number of full-time employees, the number of equipment, total occupancy rate, the number of total declaration, total handling amount, the number of unloaded trucks, overtime, amount of goods, pricing (storage and handling charge) and liquidation amount. In the continuation of the study, a comparison matrix was created between these criteria and the relative weights of these criteria were detected by using the analytical hierarchy method (AHP) and the most important ones affecting the performance were detected.*

Keywords *– Bonded Warehouse, efficiency, analytical hierarchy process (AHP), performance*

Paper ID: 39

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CARBON REDUCTION SCENARIOS IN HIGHWAY AND ITS RELATIONSHIP WITH PUBLIC HEALTH

Abstract *– WHO (World Health Organization) says" Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year, from malnutrition, malaria, diarrhea and heat stress". This is only expected in the very near future. So, many countries agreed on the fight against climate change with Paris Agreement. Turkey submitted INDC report for emission targets with this agreement. In the report, logistics is one of the main areas that cause CO2 emissions so the targets are listed to reduce emissions in the field of logistics. Many studies show that the highway causes the highest emissions both globally and locally in Turkey. So it is seen in the report that one of Turkey's goals is to reduce the use of highway. This study presents current situation about Turkey's logistics CO2 emissions. And new emission values have been estimated over the scenarios in which the highway usage is reduced. These estimations were obtained from the data which is in literature, TUIK, TCDD, UAB, KGM, WHO, UNFCCC, STATISTA, ICCT. The estimations show the reduction of emission values and put the interest of public health.*

Keywords *– Carbon Reduction, green logistics, highway emissions, urban health.*

Paper ID: 40

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SMART ECOSYSTEMS IN SUPPLY CHAIN MANAGEMENT

Abstract *– Today's supply chain systems are becoming increasingly smart and collaborative. In this context, there are a variety of technologies coming together in internet of things (IoT) philosophy to provide end-to-end visibility, transparency and collaboration of the supply networks. Combined use of disruptive technologies such as sensors, robotics, cloud, 3D printers, block chain, wearable technologies, virtual reality and artificial intelligence facilitate the formation of networked ecosystems with increasingly enabled degrees of smartness in Industry 4.0 era. This study offers a literature review with the aim of revealing the role and importance of these major technologies from supply chain management integration perspective. An overall view is provided for these multiple recent technologies acting as essential components of today's collaborative and networked ecosystems. It is put forward that smart integration of today's supply chain management systems require an entirely technology-intensive approach which simultaneously benefits from this broad array of technologies to result in dynamic, smart and collaborating network structures.*

Keywords *– Collaboration, disruptive technologies, smart ecosystems, supply chain management*

Paper ID: 41

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A LITERATURE REVIEW ON TRAIN SCHEDULING PROBLEM: FROM 2010 TO 2020

Abstract *– Railways have always been reliable, cheap and effective option for transportation of goods and people. Since the beginning of the industrial revolution, railways have been one of the most important driving forces for the economy of a country. For these reasons, improving efficiency of railway operations management is very crucial. That is why, in this study an important part of railway operations management which is called train scheduling problem is reviewed. Extensive literature search have been made and analyzed under two main groups which are called Train Scheduling (Timetabling) Problem and Train Rescheduling (Dispatching) Problem. Timetabling deals with generating a feasible timetable for the trains in a railway network, whereas, Dispatching aims to reschedule the trains after a disturbance in the system. Commonly used solution methods have been surveyed and reported. Additionally, papers are categorized in regards to their solution approaches, infrastructures and objectives. The literature review provides information about the handling and solution methods of the problems in the last decades.*

Keywords *– Railway operations, train rescheduling, train scheduling.*

Paper ID: 42

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LOCATING MOBILE AND PERMANENT LOGISTICS DEPOTS IN EARTHQUAKE PRONE REGIONS

Abstract *– In this study, we focus on locating permanent and mobile logistics facilities to be used for distribution of basic materials such as hot food, water, snacks, soft drinks and blankets to earthquake victims after an earthquake. Istanbul-Avcılar which is located just through an important earthquake fault line and has the potential of dramatic earthquake loses is selected to apply the case study. First, the criteria to evaluate the candidate locations of demand points, mobile facilities and permanent logistics depots are determined. Second, all possible locations of demand points, mobile facilities and permanent logistics depots are found. Next, candidate locations are selected using the pre-determined criteria. Finally, in this study, using GIS Network Analyst Tool (in which Dijkstra Algorithm is used) the most suitable locations for mobile logistics facilities and central permanent logistics facility are determined in order to deliver humanitarian aid and service to the demand points in the shortest time. The locations have been found for new facilities, minimizing the transport time from the designated facilities to the survivors (demand points). It is foreseen that these facilities should be used primarily.*

Keywords *– Disaster logistics, facility location-allocation, GIS, humanitarian logistics, Istanbul earthquake.*

Paper ID: 43

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DEFENCE INDUSTRY ARTIFICIAL INTELIGENCE APPLICATIONS ON WARRIOR'S LOGISTICS SUSTAINMENT

Abstract – *Throughout history, humanity increases its civilization as long as it can adapt nature to itself. The distances covered in technology and science from the past to the present and especially in our recent history, the developments in the automotive industry after the Industrial Revolution in the 18th and 19th centuries, and the accelerations in computers and informatics have brought artificial intelligence (AI). Considered as the 4th Industrial Revolution, AI has become a reality from dreams in today's world. So, is AI really a threat or a facilitator? At this stage, AI is a potential that should not be feared, but should be approached and used carefully. Theories that have been spoken for decades such as Sea Domination Theory, Edge Belt Theory, Air Domination Theory, Space Domination Theory, End of History Thesis, Clash of Civilizations Thesis and Grand Chessboard Theory will be replaced by Putin's discourse at the opening ceremony of new education year he attended" the country that takes the lead in the sphere of computer-based AI will rule the world'2 in September 2017. Many inventions that have changed human history are military-based technologies. It is the same technology that detects / tracks heat with robot technology and eliminates the threat. AI will reveal technological innovations as well as bring many military innovations with it. This study is based on document research, analysis and deduction method. Paper aims to present emerging Turkish defense industry artificial intelligence applications in military logistics and impacts on forefront warriors' logistics in the area of operation. As AI becomes more intelligent throughout its evolution, predictive defense logistics technology could take logistics decision makers/leaders more further into the territory of anticipatory logistics innovation based delivery models, supplying goods enhancing the sustainment of new generation warfare operation area warriors by only focusing on their real mission before they even realize what is needed, which has direct, precise and restrictive effects on the outcome of any kind of military activity capabilities.*

Keywords – *Artificial intelligence (AI), decision making, leadership, military logistics, new generation warfare, sustainment.*

Paper ID: 48

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PARCEL LOCKERS AS THE LAST MILE DELIVERY INNOVATION: A SYSTEMATIC LITERATURE REVIEW

Abstract – *Parcel lockers have started to become a popular solution in the last mile delivery. Therefore, most of the study is tried to better understand the different reasons and obstacles underlying parcel locker usage in the last-mile delivery process also rose. However, the range of these published studies is both interdisciplinary and fragmented. There is a lack of research that systematically investigates and introduces a broad review of parcel lockers. This research aims to present the outcomes of a systematic review of research on parcel lockers. This research findings present drivers of parcel lockers use, challenges, and opportunities in parcel lockers implementation and suggestions for future studies. This research will contribute to parcel lockers literature, and the findings may provide practitioners and researchers to reach an in-depth evaluation of this last-mile delivery innovation.*

Keywords – *City logistics, innovative solutions, last mile delivery, self-service technologies.*

Paper ID: 49

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SEARCH FOR OPTIMUM URBAN PARCEL DELIVERY SYSTEMS IN COVID-19 PANDEMIC CRISIS

Abstract *– Recently, inner city parcel delivery has become a major problematic issue in E-commerce. Because of the Covid-19 pandemic crisis, the percentage of E-commerce sales in retail logistics has increased immensely. This leads an urgent requirement of a search for optimum modeling of urban parcel delivery systems which guarantees cheaper, faster, more flexible and environmentally friendly delivery of items. The objective of this article is to understand the impacts of electric vans and cargo bikes for the last-mile delivery of parcels. The simulation of various scenarios with different shares of electric vans and bikes assesses the impacts of electrification on daily total delivery time, travelling distance of delivery vehicles and costs including external costs. Within in this context, two-echelon distribution systems, deployment of zero-emission electric cargo vans and bikes and their possible applications in highly populated cities are discussed. Based on the simulation results, daily delivery costs including operational, external and customer costs are estimated for each simulation scenario. The cost figures in EU report" Handbook on the External Costs of Transport" dated 2019 are used as input parameters for the external cost model which includes air pollution, climate change, congestion and noise costs. At the end, the scenario which deployed high percentage of zero-emission electric cargo vans and bikes reduced the daily CO2 emission 38,67 % and achieved 43,70 % savings on daily external cost. This article might lead further detailed researches on this subject such as application of the distribution and total cost estimation models for parcel delivery operations in highly populated cities such as İstanbul.*

Keywords *– Heuristic models, parcel delivery systems, urban distribution models, two-echelon distribution systems.*

Paper ID: 52

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CAPABILITY-BASED LOCATION AND RESOURCE PLANNING FOR POST-DISASTER EMERGENCY MEDICAL SERVICES

Abstract *– In case of mass casualty events such as earthquakes, floods and hurricanes, the capacity of existing medical centers is not sufficient for the treatment of casualties. Therefore, field hospitals / temporary medical centers are needed to provide effective and rapid medical service. In this case, the problem consists of deciding the location and number of field hospitals and assigning casualties to the medical centers based on their resources such as medical staff, bed capacity, etc. Since different medical service is needed for different types of injuries, the capability of medical centers should be taken into account as well as their resources. Besides, there are many uncertainties such as the severity of the disaster, the number of affected casualties, damaged roads and buildings, etc. For this reason, we proposed a stochastic model for capability-based location and resource planning of emergency medical centers for post-disaster medical response. A real case study has been conducted for different earthquake scenarios in order to test the proposed model. The results were evaluated according to different criteria, and recommendations were made.*

Keywords *– Capability-based assignment, disaster management, emergency medical services, facility location, humanitarian logistics, resource planning.*

Paper ID: 55

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SUSTAINABLE AGRI-FOOD SUPPLY CHAIN DESIGN WITH A QFD-ANP HYBRID MODEL

Abstract *– The rapid consumption of natural resources due to the increasing world population and the disruptions in the agri-food supply chain during the restrictions of the pandemic period, have once again brought up the necessity of establishing sustainable agri-food supply chain strategies. The agriculture-food supply chain is a vital issue that concerns the entire population of our country, both in terms of consumers and the people who make their living from this sector and its extension sectors. In this study, the Quality Function Deployment (QFD) and Analytical Network Process (ANP) hybrid method was used to determine the design requirements that will contribute the most to sustainability according to the three dimensions of sustainability, economic, environmental and social factors in agri-food supply chain management and strategy planning. Bursa province is considered as a case study. According to the results of the study, the prior technical requirements that will contribute the most to the three dimensions of sustainability; " Developing awareness of sustainable agricultural-food methods and correct agricultural practices for farmers", " Lean systems that bring the producer directly with the consumer" and " End-to-end integrated value chain applications and predictive demand-price balance". This hybrid approach also provides to consider combination of different design requirements to design sustainable agri-food supply chains.*

Keywords *– Agri-food supply chain, analytical network process (ANP), quality function deployment (QFD), sustainability.*

Paper ID: 56

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LOCATION AND ROUTING ASSESSMENT ON PARCEL LOCKERS, METHODS AND KEY ASPECTS: A LITERATURE REVIEW

Abstract *– Last mile distribution still remains to be most expensive part of the logistics operations. Beside the cost, it also has detrimental impact on environment therefore, all the unnecessary actions should be averted. Repeated customer deliveries caused by customer not being at home by the time of delivery adds extra burden on cargo operations. Taking urban areas traffic congestion into account, second or third visitations to customers addresses will delay delivery time even further and cause dissatisfaction. Parcel locker concept which is seen to be recognized by many logistic firms can be the newest solution to last mile delivery problem. Customers can choose a parcel locker location suitable their route after failed delivery attempt or select their pick-up type; home delivery or collecting on the way of home, before completing online purchase. Parcel lockers has been widely studied in academic literature in the scope of acceptance and efficiency. But papers related to location and routing problems are rather limited. Hence a literature review in these aspects to apprehend the current situation and gaps is conducted in this paper. Google Scholar database is chosen since it provides broad search opportunity. Keyword that are used for the purpose are "parcel locker", "collection and delivery point", "delivery locker", "smart locker", "location", "optimization","‘ network". This process yielded a result of 777 papers. After eliminations 57 papers are selected to be reviewed.*

Keywords *– Last-mile delivery, collection and delivery point, location, parcel locker, smart locker.*

Paper ID: 57

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A GENETIC ALGORITHM INTEGRATED SIMULATION OPTIMIZATION APPROACH FOR SCHEDULING OF A REAL BUS SHUTTLE SYSTEM

Abstract *– Logistics and transportation sectors are among the sectors that affected by knowledge and data era. Proper usage of know-how and data is vital for these sectors and ensures very high competitiveness, profitableness, and sustainability. Optimization techniques play important role for increasing service quality and ensuring the issue mentioned above. In this study a genetic algorithm integrated simulation optimization approach has been developed in order to increase performance of service system without additional investment cost for a real bus shuttle system. Firstly, a proper encoding process has been done in order to adapt our scheduling problem to genetic algorithm. Next, developed genetic algorithm has been coded in VBA environment and integrated with ARENA simulation software. Then average travelling time performance indicator, which is an important performance indicator in bus transportation systems, is minimized. This performance indicator directly effects passenger satisfaction and total performance of the studied system.*

Keywords *– Simulation optimization, bus transportation, genetic algorithm, bus scheduling.*

Paper ID: 59

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IMPORTANCE OF BICYCLE TRANSPORT WITHIN EU CLIMATE CHANGE POLICIES AND INFERENCES FOR TURKEY

Abstract *– Due to global climate change, various measures are taken in cities all over the world. Changes, including the way of life and transportation, are becoming more common. One of the transportation preventions at the forefront of these changes is the widespread use of bicycles. The aim of this study is to focus on bicycle transportation within the scope of EU climate change policies and research on the current situation of bicycle transportation in Turkey. Various policy decisions have been taken within the scope of adapting to climate change with many agreements, some of which our country participates. But the ineffectiveness of the policies taken in our country constitutes an opposing ground to the agreements. Indeed, only a few cities in the whole country have a bicycle network. This is a qualitative research based on secondary data regarding with the whole country scale. As a result, it's been observed that bicycles are not used sufficiently due to the lack of infrastructure and political priority in our country. For instance, one of the most important lesson taken from the example of Germany is the perfect integration of bicycle network into the existing transport system. This paper is composed of three main parts. First part consists of definition, causes and consequences of the global climate change. Second part focuses on bicycle transportation, in the context of EU's global agreements and targets for future transport policies. Last and third part examines Turkey by comparing it with Germany.*

Keywords *– Climate change, climate change policies, bicycle transportation system, Turkey.*

Paper ID: 60

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A DYNAMIC PROGRAMMING APPROACH FOR MULTI-PERIOD VEHICLE ALLOCATION PROBLEMS

Abstract *– Due to globalization with technological developments; production, consumption, and trade have spread beyond the borders of the countries. The increasing distance between suppliers and buyers and the necessity of transporting goods over longer distances have increased the importance of transportation activities. Correspondingly, the effective and efficient execution of these activities has become a requirement for businesses in terms of both competitive advantage and continuity in global markets. In this context, Vehicle Allocation Problem, which is one of the decision support problems applied especially in long-haul freight transportation, is encountered more frequently. The problem, where demands are met with full-truckload transportation, consists of decisions about loaded and empty vehicle movements over a finite planning horizon. In line with these decisions, it is aimed to maximize profits or minimize costs through effective transportation operations. In this study, a vehicle allocation problem is modeled as Markov Decision Process and solved by the Dynamic Programming method. Using this model, a problem is developed that considers vehicles that are both waiting at nodes and traveling between nodes throughout a multi-period planning horizon. Then, we find the optimal vehicle movements that provide the maximum profit. To the best of our knowledge, there is no study in the literature that considers the problem with the dynamic programming approach. The added value of the proposed approach is analyzed through several numerical examples.*

Keywords *– Dynamic programming, multi-period, transportation operations, vehicle allocation.*

Paper ID: 61

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COST-EFFECTIVE OPTIMIZATION MODEL FOR IMPORT OPERATIONS VIA MARITIMETRANSPORTATION

Abstract *– As a result of developments such as increasing competition conditions, rapid development in technology, and globalization in recent years, the logistics activities have required enterprises to reconsider their management. Since logistics costs have an important share in total operating costs and directly affect financial performance, it is a necessity to manage and control logistics activities and the costs caused by these activities. Most of the foreign trade transactions in today's world are carried out by maritime transportation. For this reason, the ports and the warehouses around the ports have become an important link in the supply chain, and the effective and efficient use of the ports can reduce the costs in logistics operations. In this study, cost items in logistics processes have been examined. It aims to optimize the storage and transportation costs and the costs incurred due to delays in customs processes encountered in maritime import operations. For this purpose, a time-based linear programming model was established and solved for a company operating in the Kocaeli region by considering the costs in the surrounding location.*

Keywords *– Supply chain management, logistics costs management, linear programming.*

Paper ID: 63

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THE JOURNEY OF ANTEP PISTACHIO SUPPLY CHAIN

Abstract *– The pistachio is a member of the cashew family. It is a small tree originally from Central Asia and Middle East. Pistacia vera, which known as Antep Pistachio, is the one of the species within the genus Pistacia that are often referred to as a pistachio. In Turkey Antep pistachio, pistachio vera, is cultivate in Şanlıurfa, Gaziantep, and Adıyaman. Antep pistachio harvested in 7th and 9th months of each year. After harvest it is left to dry in sunlight. The dried pistachios will collected for sale. Antep pistachio used in many reaches such as; baklava, chocolate, Turkish delights etc. In the adventure of Antep Pistachio to the consumer is take place in three different facilities. These three facilities can be dependent or independent from each other. In these facilities antep pistachio is dried, sorted, calibrated, purificated, cracked, selected, roasted and packaged. After all these processes pistachio is ready to delivery. In this study, the journey of Antep pistachio is investigated. The potential problems arising during the supply chain are discussed.*

Keywords *– Antep pistachio, logistics, manufacturing steps, supply chain.*

Paper ID: 64

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LOCATING CELL ON WHEELS IN EMERGENCY USING FUZZY COCOSO AND WEIGHTED MINIMAX METHODS

Abstract *– Disaster management encompasses the organization and management of resources and responsibilities to deal with all humanitarian aspects of emergencies, including preparedness, response and recovery, to mitigate the effect of disasters. In an emergency scenario, providing fast communication has a significant impact. In this manner, cell on wheels (or portable cell tower) comes with the solution. The Cell on Wheels (CoW) is a portable base station that provides temporary cellular network coverage for grand events and emergency circumstances when existing base stations are destroyed, or during natural disasters. It is economically and operationally difficult to build fixed base stations in areas where people are concentrated for a short time. It takes advantage of a strong signal for cell phone connections at any site. Its instant installation features and rapid relocation solve the problems in coverage area. In this study, a hybrid fuzzy CoCoSo (Combined Compromise Solution) multi-criteria decision making and weighted minimax methodology is proposed to locate a CoW. The methodology first determines the weights of the existing locations with CoCoSo method according to the experts' fuzzy evaluations based on criteria. Later, the coordinates of the CoW are investigated by the weighted minimax method. A case study is conducted to deploy a CoW to serve six emergency places in one region. By applying the proposed method, coordinates for CoW are determined in line with the weights and distances of the emergency places. The aim of the study is to guide future studies of determining the coordinates of portable emergency devices.*

Keywords – *Cell on wheels, CoCoSo, disaster management, fuzzy set, localization, weighted minimax.*

Paper ID: 66

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A LINEAR PROGRAMMING APPROACH EXAMPLE ON CONVERTING PASSENGER AIRCRAFT INTO A FREIGHTER (P2F) DURING COVID-19 PANDEMIC

Abstract *– It is said that the world is a small village and the most important factor that eliminates these borders is logistics. Logistics reveals the fact that distances are insignificant and that it is possible to reach a point, whether it is human or cargo transportation. There is one such logistic model that makes use of the blessings of technology more and more, and it constantly improves itself and represents the concept of globalization. This model is of course the air transport. In the COVID-19 pandemic crisis, which we have passed through and left its mark on this century, many airways which specialize in carrying passengers could not fly due to the closed airspace and remained idle. While almost all sectors left this crisis with a serious injury, air cargo transportation has emerged stronger. In a sector that grows at such a pace, every field that cannot be left idle is valuable and it is essential to establish the correct and effective coordination between load and balance. Managing the capacity of aircraft in various types and subtypes, and being able to manage the revenues while managing this capacity are very important for airline companies engaged in cargo transportation. In this paper, in which the problem of converting a passenger plane to a cargo plane in the most effective way using the linear programming model (LP) is discussed, an example of optimization that will serve as an example to the correct use of the relevant volume while maximizing profit is discussed.*

Keywords – *Air cargo, linear programming, loading problem, pandemic.*

Paper ID: 67

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A DYNAMIC VEHICLE ALLOCATION PROBLEM WITH ROLLING HORIZON FRAMEWORK

Abstract *– In a globalized world where production and trade continue uninterruptedly, suppliers and buyers located far away from each other are tightly connected and goods can be transported over long distances. Therefore, the allocation of vehicles is one of the prominent decisions involved in road freight transport planning and control. Vehicle allocation problems address movements of empty and fully-loaded vehicles from the pick-up points to the delivery points throughout a finite planning horizon. Demands can be released over time in a dynamic environment. Some of the demands are released just before the deadline, while others may be known from the beginning of the planning horizon, or some of them may be cancelled during the planning horizon. Using the dynamic rolling horizon framework, the static vehicle allocation model is re-run at each decision point and the delivery plan for vehicles is obtained by taking newly released or cancelled demands into account. The study contributes to the related field by making analyses on the effects of respecting online demands on the logistics key performance indicators. Accordingly, a Mixed-Integer Linear Programming Model developed for the allocation problem is implemented in a dynamic environment by using the rolling horizon framework. Numerical analyses reveal the added value of the research for both academic and practical purposes.*

Keywords *– Freight transportation, dynamic vehicle allocation problem, mixed-integer linear programming model, profit maximization, rolling horizon, online demand.*

Paper ID: 72

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AN APPLICATION OF MOBILE HEALTHCARE SERVICE ROUTING AND SCHEDULING PROBLEM IN ANKARA

Abstract *– Rural-to-urban migration has increased significantly over the last 60 years based on the developments in industry. Improvements have been observed in many areas in the cities as a result of the increase in the population, with reformed, reachable Health Services being the leading one among these areas. Meanwhile, as the population of rural areas has decreased, problems with access to many services, including healthcare services, have begun to emerge. Because establishing health institutions in rural areas can be very expensive, some regulations have recently been enacted to provide health services to rural areas. Family medicine service (FMS) has been defined in Turkey's Family Medicine Law as the provision of personal preventive health services as well as primary diagnosis, treatment, and rehabilitative health services to each person in a comprehensive and continuous manner, regardless of age, gender, or disease. Furthermore, in rural areas, FMS is provided in the form of a Mobile Health Service (MHS). The Ministry of Health of Turkey provides MHSs in rural areas through 7.5 thousand doctors and 3.4 thousand family health centers. Every month, the MHS enables 9 million people to access adequate healthcare services. Rural mobile healthcare delivery in Turkey is modeled in this study as a Multi-depot Time Constrained Periodic Vehicle Routing Problem (md-TCPVRP). The problem is to determine daily routes of the doctors, who are located in different FMS, for each month, under some constraints such as maximum workhours, route duration, minimum service time per visit, and continuity of care while minimizing the total route distance. First, we present the mixed-integer linear programming (MILP) formulation of the problem. The MILP formulation solves small-size instances due to the NP-hardness of the problem. Thus, we propose a Greedy Heuristic (GH) to solve large-scale instances of the problem in a short amount of time. The performances of the MILP formulation and GH are evaluated on the data for 18 districts of Ankara province. Experimental results show that while MILP formulation obtains solutions for only 10 districts within 2 hours, GH reaches solutions for all 18 districts within 6 seconds and provides 14% improvement on total route distance according to the real-life application of the Health Directorate.*

Keywords *– Healthcare logistics, linear programming, heuristic algorithm, multi-depot, periodic VRP, scheduling*

Paper ID: 74

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NEW METHODS FOR CONNECTIVITY OF CRITICAL NODES FOR POST DISASTER MANAGEMENT

Abstract *– Some roads in the disaster area may be closed due to debris or collapse/deterioration after disasters. It is important to reconnect the nodes where the connection is broken due to closed edges. It is necessary to restore transportation as soon as possible for the evacuation of people, transport to hospitals or distribution of aid. Unlike literature, different types of vehicles are used in our problem to repair broken links and they can be used simultaneously. In the multi-objective model, minimizing the transportation time to important nodes and minimizing the maximum time required for total connectivity of the network are considered as objective functions. Since even the small sized instances of this NP-hard problem require a long solution time, a heuristic method is needed. An intuitive method has been developed for this problem, and numerical results are presented.*

Keywords – *Connectivity, disaster management, heuristic.*

Paper ID: 77

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AN OPTIMIZATION APPROACH TO POSITION DEMAND DRIVEN MRP (DDMRP) BUFFERS IN A MAKE-TO-ORDER ENVIRONMENT IN BILL-OF-MATERIALS BY CONSIDERING VARIANTS

Abstract *– It is a well-established fact that supply and demand variability must be managed carefully to maintain a responsive and efficient supply chain. Efficient management of the material flows from manufacturing to distribution network plays a significant role for any supply chain in making profit while satisfying needs of end customers. The Demand Driven MRP (DDMRP) is a recent, relatively new approach promising better options in management of material flows against current methodologies. DDMRP uses an innovative multi-echelon pull methodology to plan and execute flow of material by using strategically placed decoupling stock points (buffers) in Bills of Material (BOM) structure. The purpose of decoupling buffers in BOM is to mitigate supply and demand variability in both directions. The positioning of buffers must provide a lead time within customer tolerance while minimizing inventory related costs. The number of studies in the literature on DDMRP buffer positioning is scarce and mostly utilize rule-based practices supported by expert opinions. Only a few present mathematical models specific to BOM with common parts without considering multiple variants using the same BOM structure. Therefore, we address this gap in the literature and present an optimization model to determine optimal position of DDMRP buffers in a make-to-order (MTO) production environment with multiple variants and numerous common parts in BOM structure. Then, we propose a genetic algorithm (GA) based solution approach to solve the model. We run several experiments on different BOM structures and assess the sensitivity of end part lead times and buffer levels to the sequencing order of variants and common parts in the production process. We aim to provide useful insights for DDMRP buffer positioning logic and point possible research gaps for future study.*

Keywords *– Buffer positioning, demand driven MRP, inventory management, genetic algorithm, production planning and control.*

Paper ID: 79

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A CIRCULAR ECONOMY BASED APPROACH FOR SUPPLIER SELECTION IN AGRI-FOOD SUPPLY CHAINS

Abstract *– The circular economy (CE) targets maintaining products, equipment, and infrastructure in use for longer. The more extended use improves the productivity of the resources, and it provides more sustainable ecosystems. The CE approach focuses on redefining growth and emphasizing social well-being. Agriculture is one of the fields where social well-being has a crucial impact on the system. The agri-food systems are the main enablers for rural development. The developing technologies, such as Industry 4.0 technologies, allowed redesigning the agri-food chains by concerning the value added to the rural areas. Having an integrated approach for the whole agri-food supply chain is one of the positive manners to reach a sustainable and value added system. As a strategic decision, choosing the most appropriate supplier is also a critical issue for the farming companies. Therefore, this paper aims to create a decision-making framework for supplier selection for agri-food supply chains. The selection problem is approached as a multi-criteria decision-making (MCDM) process. To mimic stakeholder inclusion in the decision-making process, a group decision-making (GDM) approach is suggested with MCDM. The Evaluation Based on Distance from Average Solution (EDAS) technique is recommended to choose the right supplier for a farm thanks to its efficiency and distance-based algorithm. Two leveled assessment criteria are generated from the academic literature to assess the possible alternatives. Moreover, the EDAS technique is extended with the 2-tuple linguistic model to augment its accuracy with linguistic variables. The 2-tuple model also expands the linguistic interpretability of the results and creates decision-making environments closer to the human cognitive processes. This also creates a flexible environment for the decision-makers. Finally, a case study is presented with detailed results and analysis to test the applicability of the suggested methodology.*

Keywords *– 2-tuple linguistic model, agri-food supply chain, circular economy, EDAS, supplier selection.*

Paper ID: 82

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ANALYSIS OF GREEN SUPPLY CHAINS IN ACCORDANCE WITH ENVIRONMENTAL SUSTAINABILITY CRITERIA

Abstract *– In order to achieve national and international sustainable development goals, companies are expected to contribute in their activities in terms of economic, social and environmental aspects. In this context, the supply chains established by the companies should also be sustainable. Supply chains organized for environmental sustainability are called green supply chains. The environment is prioritized while carrying out activities in green supply chains. Thus, it can be provided measuring and managing the damage to the environment, reducing the carbon footprint, and becoming eco-efficiency. Green suppliers also need to deliver performances that help companies meet these environmental goals. There are many criteria that should be considered in the selection of suppliers in green supply chains and reflect environmental sustainability. This study includes the assessment of criteria for the evaluation and selection of suppliers in green supply chains. Green supplier selection practices in the last ten years have been examined. The environmental sustainability criteria considered in these studies are listed. According to the results concluded, the most used environmental sustainability criterion is the environmental management system. This study is intended to help evaluate environmental sustainability assessment measures in green supply chains.*

Keywords – *Ecological supply chain, environment, green supply chain.*

Paper ID: 83

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SIMULATED ANNEALING ALGORITHM FOR THE TRAVELING SALESMAN PROBLEM WITH DRONE UNDER RECHARGING POLICY

Abstract *–The traveling salesman problem with drone (TSP-D) is a delivery problem arising in last-mile delivery. In this problem, a truck and a drone concurrently deliver parcels to customers. The drone can carry one parcel at a time and must return to the truck after each flight to load the next customer's parcel. When onboard, the truck operator swaps the drone battery to ensure the subsequent flight. The drone can also travel on the truck in tandem. This problem is gaining attention among both practitioners and researchers. However, it is investigated assuming battery swapping policy thus far. Swapping the drone battery after each flight entails keeping as many batteries as the number of flights. This study investigates the TSP-D under recharging policy, assuming that the drone battery is recharged while the drone travels on the truck. A simulated annealing algorithm is proposed to solve the problem. A computational study is conducted to quantify the impact of the recharging policy on the TSP-D.*

Keywords – *Drone delivery, recharging, simulated annealing, traveling salesman problem with drone.*

Paper ID: 84

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DETERMINING SUITABLE ROUTES FOR VACCINE DISTRIBUTION TO HOSPITALS: APPLICATION OF ANKARA PROVINCE

Abstract *– With the COVID-19 epidemic, which started in Wuhan, China in 2019 and spread all over the world, changes in traditional practices began to occur and new problems emerged in parallel with these developments. These problems, which emerged with the COVID-19 pandemic, have become a subject that attracts the attention of researchers. In order for the world to cope with this epidemic more quickly, it is important to ensure community immunity by vaccinating the population both in our country and in the world. With the increase in the supply of vaccines, new problems arise such as determining the capacities of hospitals where vaccines will be administered, choosing hospitals where vaccines can be administered, and determining routes to distribute vaccines to hospitals. Vehicle routing problem first emerged in the 1950s, and today it is an important problem area that can be adapted for different assumptions and new problems. In this study, a model has been proposed to transport vaccines from a vaccine distribution center to hospitals where vaccines will be administered, as soon as possible. A model proposal has been made by using the vehicle routing problem models in the literature. In order to test the effectiveness of the developed model, an application example was made for the province of Ankara and the problem was solved in the GAMS 24.3.1 program.*

Keywords – *COVID-19, distribution problem, mathematical model, vehicle routing problem.*

Paper ID: 85

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ROBOTIC PROCESS AUTOMATION IN SUPPLY CHAIN MANAGEMENT

Abstract *– Supply chain processes are getting more and more complex day by day. Because the flow of the information, product and money is realized by many players in the system. On the other hand, managers have invested millions of dollars making their supply chain operations and infrastructure. While retailers, producers, suppliers and logistics service providers have accepted some types of supply chain management systems, performing process automation and data integration remain a challenge. Furthermore, digital transformation is playing a key role in the supply chain and replacing the way that managers deliver products, manage processes and integrate orders. Here, Robotic Process Automation (RPA) is being used at supply chain processes to automate and expedite operations that were once performed manually. With digital transformation, Robotic Process Automation reshapes the supply chain structure and minimizes inefficiency across the organization. Besides these ordinary managerial operations, managers can implement Robotic Process Automation to integrate and manage data-driven processes. With this study, it is aimed to contribute to the deficiency in the literature on the subject of Robotic Process Automation. First of all, it was examined which processes in the supply chain management could be improved with the Robotic Process Automation system. After that some use cases applying Robotic Process Automation in the supply chain management were examined. In this way, determinations were made to increase efficiency and effectiveness in supply chain processes.*

Keywords – *Supply chain management, robotic process automation (RPA), logistics, efficiency in supply chain.*

Paper ID: 87

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THE EFFECTS OF EU GREEN AGREEMENT TO THE TURKISH LOGISTICS SECTOR

Abstract *– The use of fossil fuels takes the lead in meeting the energy need of humanity. The increasing use of fossil fuels causes negative effects to the world, especially global warming. The European Union is committed to gradually reducing greenhouse gas emissions with the Green Europe Agreement accepted in 2019. One of the seven main policies of the EU in reducing greenhouse gas emissions is the implementation mobility by environmentalist methods. In the future, measures to be taken across the Union may lead to various sanctions within the EU's trading partners. The EU is one of Turkey's largest trading partners. The aim of this study is to evaluate the policies required for an environmentalist transformation from the point of the Turkish logistics sector. In the study, expert opinions will be consulted to analyze the possible effects of the Green Deal on the Turkish Logistics sector. Content analysis will be performed with the data obtained from the interviews. As a result of the analysis, it will be tried to determine the practices that the Turkish Logistics sector should follow for an environmentalist transformation.*

Keywords – *EU green deal, carbon emissions, Turkish logistics sector.*

Paper ID: 88

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HOW LEAN THINKING HELP TO SOLVE COVID-19 RELATED PROBLEMS? - A LEAN PATIENT EXPERIENCE MAP

Abstract *– Lean thinking is a philosophy used for eliminating wastes not only in manufacturing sector but also in service sector. Until now, there is a numerous literature on lean implementations. On the other hand, there is a scarce literature on lean thinking implementations related with COVID-19. These studies are conducted in a variety of sectors (e.g. healthcare, tele-medicine, pharmacy, public administration, maritime, research lab, SME, education, manufacturing) with different lean tools (e.g. 5S, lean six sigma, value stream mapping, lean UX) to reach several objectives (e.g. supply chain resilience, organizational resilience, quality, safety). The first aim of this study is to display these studies. In addition, the vaccination process of a patient is visualized with value stream mapping. This map is also enlarged with customer experience based responses (emotional, sensory, behavioral, cognitive, and relational). Last but not least, it is aimed to specialize seven wastes in healthcare for COVID-19 context.*

Keywords – *COVID-19, experience design, healthcare sector, lean thinking, waste.*

Paper ID: 90

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DIGITALIZATION BARRIERS OF LOGISTIC OPERATION: A SYSTEMATIC REVIEW AND FRAMEWORK DEVELOPMENT

Abstract *– Advancements in new technologies, information, and communication systems such as the internet of things, artificial intelligence, cyber-physical systems, have caused an explosion in the digitalization of the systems. Moreover, the successful implementation of digital technologies has brought various benefits to logistic firms like enhancing production performance, optimize information flow, and improve the agility and ability of operations through the flexibility of the systems. Thus, logistic companies must deploy digital technologies in operations to stay ahead of the competition. However, many logistic companies are still in the early stage of implemented digital technologies in their process, and there is not enough information about how companies are adopting digital technologies successfully. Therefore, this study explores what barriers logistic firms face in adopting digitalization in their operation process. A systematic literature review approach is conducted using the SALSA (Search, Appraisal, Synthesis, Analysis) technique. The search encompasses two well-known databases (Web of Science Core Collection and Scopus) to narrow down the study and determine articles related to the research purpose. The systematic review methodology of this study offers a new perspective in identifying the digitalization barriers, bridges the gap in the literature, and helps the practitioners and managers develop an in-depth understanding and eradicate digitalization barriers for logistic companies.*
Keywords – *Barriers, digitalization, logistic, operation, systematic review.*

Paper ID: 91

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SUPPLY PLANNING BASED ON THE ANALYSIS OF COVID-19 DATA

Abstract *– The companies in healthcare often provide vaccines, drugs and equipment to hospitals and general practices across the country. Based on status of COVID-19 cases, it is necessary to identify locations that demand highest for supplies. Supply planning is a crucial task particularly in crisis times aiding the efforts to prevent the pandemic from spreading. In this study, the COVID-19 data is processed and then analyzed in order to provide an efficient supply plan. The visual reports obtained during the analysis will help to make better decisions and derive future projections.*

Keywords – *COVID-19, supply plan, data analytics, data science.*

Paper ID: 92

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DETERMINATION OF SUSTAINABLE URBAN LOGISTICS PERFORMANCE INDEX (SULPI)

Abstract *– The determination of urban logistics performance criteria is an important basis for economic, social and environmental coordinated development. The correct evaluation of the urban logistics operation and the creation of the relevant macroeconomic regulation and management policies are valuable in terms of ensuring the economic, social and environmental sustainable development of the city. The aim of the study is to develop a sustainable urban logistics performance index (SULPI). The study uses the experience gained by the authors during the development of the sustainable urban logistics plan for the city of İzmir. Novelty of the study mainly relies on its approach to determine criteria so that they can be easily evaluated for cities for which the SULPI is calculated. SULPI criteria are determined and their weights were calculated using the AHP's pairwise comparison method with the help of four experts. The SULPI was calculated for the city of İzmir to demonstrate value and applicability of the proposed method. SULPI helps authorities to compare the logistics performances of the cities with respect to the determined criteria, to make/revise plans to improve the city's logistics applications with respect to sustainability.*

Keywords – *Urban logistics, sustainability, performance index.*

Paper ID: 93

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ESTIMATION OF ELECTRONIC WASTE (E-WASTE) FOR DESIGNING REVERSE AND CLOSED SUPPLY CHAINS

Abstract *– Electrical and electronic equipment is one of the most rapidly increased sectors due to growth and development of technology. E-waste streams are dramatically increasing parallelly as a natural result of this growth. E-waste is a global problem from all perspectives. E-waste generation quantity has a critical role of serving as a key input data in designing e-waste related reverse/closed supply chains. In this study, e-waste generation is estimated for the case of Turkey using Logistic Model and Consumption & Use methods. Portable computer, mobile phone and smart TVs are considered as the selected product group. Modelling and estimation are obtained based on availability of devices in households with statistical data. Logistic model is used for modelling and making projection for availability of device and Consumption & Use method is conducted to model results for e-waste quantity estimation. Scenario analyses are performed based on carrying capacity and product life.*

Keywords – *Electronic waste (e-waste), estimation, logistic model, reverse logistic chain.*

Paper ID: 94

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THE CONCEPT OF AGILITY IN HUMANITARIAN LOGISTICS

Abstract *– Humanitarian organizations aid to provide that there is rapid, efficient humanitarian assistance available when sudden natural disasters strike or wars happen. Humanitarian organizations have to deal with uncertain, volatile and very dynamic environments. Besides the operational risks, demand and supply uncertainties, humanitarian organizations have to achieve very complicated conditions. Therefore, they need to develop methods, tools and strategies for especially their supply chains in order to react quickly to the sudden changes. Agility is the main competence for the quick response to fluctuations in the supply chain. Also, agility is a fundamental characteristic of any organization operating in an uncertain environment since it helps the organization's ability to react more rapidly and effectively to changes. Agility is a multidimensional concept which consists of both strategic and operational components. Having an agile supply chain strategy is an essential solution for the humanitarian organizations' many operations, such as logistics. Humanitarian logistics deals with the mobility operations of a disaster management system. At the same time, humanitarian logistics is a very essential element of the whole humanitarian services. This study investigates the concept of agility in a humanitarian logistics context and provides an overview of the current literature.*

Keywords – *Agility, humanitarian logistics, logistics, supply chain.*

Paper ID: 95

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ANALYSIS OF BLOCKCHAIN APPLICATIONS IN SUSTAINABLE LOGISTICS MANAGEMENT

Abstract *– Digital solutions have made extensive economic and social progress in both developed and developing countries in recent years. Blockchain technology, which is one of these solutions, first came to the fore with its applications in the field of finance and has recently proven that it can be applied in many different fields in addition to the field of finance. One of them is the compatibility of blockchain technology with the supply chain structure and then with the logistics industry. Blockchain has enormous potential for many activities, from taking the order from the supplier to the consumer, to delivering the right product, in the right quantity, in the right conditions, in the right location and at the right time. In this study, blockchain applications in the logistics sector are discussed under the title of sustainability. In terms of the logistics sector, which is one of the sectors where blockchain application is thought to be needed more in the future, the applications are examined in detail. Blockchain technology has significant potential to increase efficiency in the logistics industry and help resolve conflicts in the process. Procurement is in a position to help alleviate many of the frustrations in logistics, including shipping management, tracking and tracing, customs cooperation and trade finance. As a result, its potential contribution to the logistics sector is undeniably important. In this study, by evaluating the perspective in the literature, it has contributed to the development of blockchain applications in the logistics sector.*

Keywords – *Blockchain, logistics management, sustainability logistics, sustainability.*

Paper ID: 96

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STRATEGY EVALUATION FOR EMERGENCY LOGISTICS MANAGEMENT OF DISASTERS

Abstract *– Every year, a large number of disasters and emergencies strike our world by impacting millions of people. Disasters are supernatural events causing material and moral losses, adversely affect our vital activities. Emergency logistics cover many different activities at different times to respond quickly to various disasters. Although such activities differ according to disasters that occur, the common goal is to save human lives. Therefore, emergency logistics is vital, and it faces a variety of problems. In order to meet the needs of vulnerable people in a timely and on-site manner, the planning, implementation, and control of activities for the efficient flow of both products, materials, and necessary information from the origin point to the last moment of need constitute emergency logistics. In this study, the evaluation of strategies for emergency logistics management that contains many factors is considered a multi-criteria decision-making (MCDM) problem. Considering the complex nature of this problem, it needs to be taken into account by experts for deciding on a suitable strategic plan of emergency logistics. However, it is challenging to determine the most appropriate strategy when information is an uncertain nature. In this context, the study aims to propose a strategy evaluation framework of emergency logistics management for disasters with fuzzy MCDM methods. The evaluation factors and strategy alternatives are determined based on a literature review and consulting the experts. An application about emergency logistics management is provided to demonstrate the effectiveness of the proposed methodology. Finally, the results are provided, and future perspectives are given.*

Keywords – *Emergency logistics, fuzzy logic, MCDM methods, strategy evaluation.*

Paper ID: 97

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SMART SOLUTIONS FOR SUSTAINABLE URBAN LOGISTICS: A QFD APPROACH

Abstract *– Today, the increasing share of the population living in urban areas increases the urban mobility problems. The expanding population brings many mobility problems in cities such as traffic congestion, increasing energy consumption, pollution, etc. These emerging problems threaten livable and sustainable urban life. Therefore, the effects of urban logistics have significant impacts on cities. Urban logistics is the optimization of logistics services carried out by different companies by considering the city's traffic conditions, environmental impacts, and energy consumption. The primary aim is to make logistics services more efficient. Sustainable urban logistics should be provided for a livable city, and solutions should be produced by using today's smart solutions. This study proposes a Quality Function Deployment (QFD) model in which smart solutions are offered to ensure sustainable urban logistics. Sustainable urban logistics requirements are determined as CRs in QFD. In order to obtain more effective results, the Fuzzy Analytical Hierarchy Process (AHP) technique is used to determine the weights of the CRs. With this technique, the biases arising from the subjective nature of judgments can be minimized. Personal evaluations can be represented successfully by providing better assessments in an environment of uncertainty. After that, smart solutions determined as DRs were prioritized. As a result of the study, the top priority smart solution for sustainable urban logistics has been revealed.*

Keywords – *QFD, smart solutions, sustainability, urban logistics.*

Paper ID: 99

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PRIORITIZING THE BARRIERS OF SUSTAINABLE SUPPLY CHAIN MANAGEMENT BY BEST-WORST METHOD

Abstract *– In the global market, supply chain management plays an important role in any enterprise's major success while firms are facing heavy pressure to adopt green practices in their supply chain operations for better socio-environmental sustainability. Since the last decade, the concept of sustainability has gained popularity due to increasing socio-environmental problems, including climate change, air pollution, and different pollution-related health diseases. Integrating the concept of sustainability in supply chain operations allows the firm to build a' competitive advantage' in the market. Given the rising significance of societal and ecological aspects along with economical features, managing sustainable supply chainss has become a complicated and dynamic undertaking. Multiple and contradictory sustainability goals of stakeholders involving customers-, white- and blue-collar employees, suppliers, legislators, governments, manufacturers, retailers and third-party service providers increase the complexity of decisions that decision makers should tackle. Sector representatives care about the sustainability of the supply chains in which they operate. For this, it is important to identify and weight the factors that prevent supply chains from becoming sustainable. The aim of this study is to prioritize the barriers to sustainable supply chain management. For this purpose, the best worst method was used. Accordingly, in the first stage, barriers to sustainable supply chain management were identified through a comprehensive literature search, and then prioritization was realized by making an evaluation with an expert group consisting of practitioners and researchers. According to the results obtained, "Human factor in terms of Individual and Socio-cultural" was determined as the most important obstacle.*

Keywords – *Best-worst method, prioritization, sustainability, supply chain management.*

Paper ID: 100

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PRIORITIZING FACTORS AFFECTING GREEN SUPPLY CHAIN MANAGEMENT AND USED TECHNOLOGIES WITH PICTURE FUZZY AHP

Abstract *– The increase in environmental awareness, technologies that cause the least harm to the environment tend to be preferred by businesses. In this context, it has been aimed to use lean technologies in production systems, to reduce environmental waste and to manage environmental risks. The increase in environmental importance brings forward the concept of " green supply chain management". The main purpose of the green supply chain management is to reduce the carbon footprint, carbon dioxide and toxic gas emissions of businesses. In this study, unlike other studies, the factors affecting green supply chain management on the basis of technologies used have been prioritized with Picture Fuzzy AHP, which has been recently used in the literature. It has been aimed that this study will benefit the green supply chain management on the basis of the technologies used.*

Keywords – *Green supply chain management, MCDM, technologies, picture fuzzy AHP*

Paper ID: 102

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SIMULATION BASED REVERSE SUPPLY CHAIN NETWORK DESIGN FOR WEEE

Abstract *– Waste Electrical and Electronic Equipment (WEEE) has become an important research area in recent years due to economic and environmental factors within the framework of social responsibility. At the same time, collection and recycling of WEEE is also encouraged by regulations. However, the actors responsible for collection, recycling, transport and disposal of WEEE activities are given responsibilities according to Regulation on the Control of WEEE. For this reason, closed and reverse supply chain networks need to be re-designed and managed optimally for cost reduction. When the literature is examined, it is seen that the most important uncertainties and difficulties in the reverse or closed cycle supply chains are the quality, quantity and refurbished product demands of the returned products in reverse flow. This study aims to develop a simulation model and investigate a reverse supply chain and understand the effects of variability of the data on the performance parameters. Disassembly and refurbishment processes are thoroughly investigated in the reverse supply chain network simulation model since they contain high level of variability and fuzziness depending on the quality and design conditions of used products.*

Keywords *– Network design, refurbished products, reverse logistic, reverse supply chain network, WEEE.*

Paper ID: 105

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HOME HEALTH CARE AND DIALYSIS ROUTING WITH ELECTRIC VEHICLES AND PUBLIC CHARGING STATIONS

Abstract *– This study considers a joint multi-depot home health care and dialysis problem of routing and scheduling decisions of health specialists. The fleet consists of electric vehicles which uses both the public and private charging stations. The problem is formulated as a mixed integer linear programming model. The study develops a hybrid adaptive large neighborhood search (ALNS) algorithm. The metaheuristic integrates construction heuristic to generate initial solution and local search procedure based on variable neighborhood descent. The hybrid ALNS introduces several new problem specific procedures to effectively handle the complex structure of the problem. Experiments are conducted on realistic benchmark instances to investigate various problem specifications such as constructed teams, usage rate of fast and super-fast charging technologies, and public and private charging options. The performance of the hybrid ALNS and its mechanisms are analyzed in detail.*

Keywords – *Electric vehicles, home health care and dialysis, metaheuristic, vehicle routing.*

Paper ID: 106

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AN ANALYSIS OF DECISION MAKERS' PREFERENCES THROUGH SUPPLIER SELECTION PROBLEM

Abstract *– We consider the supplier selection problem with a focus on the methods proposed. We also review the criteria used in different methods. Reviewed methods are all based on the compensatory approaches, where a good score of a supplier in one criterion may compensate for the poor score in another criterion. We are not aware of any non-compensatory approach proposed for the supplier selection problem. In this study, the main research question is to analyze the possibility of expressing the preferences of a decision maker using a compensatory method for the supplier selection problem. We prepare a survey based on pairwise comparisons of specially designed suppliers evaluated on three criteria. The survey presents the pairwise comparison questions one by one to the participant and the responses of the participant affect the next question asked. For each participant of the survey, we check the consistency of the responses using two different mixed integer programming models; the former model assumes the supplier selection method is a compensatory method based on a weighted sum utility function, and the latter assumes the use of MR-Sort, a non-compensatory method. The survey results indicate that a weighted sum utility function can explain 22% of the participants' preferences, whereas MR-Sort is capable of explaining the preferences of all participants.*

Keywords – *Supplier selection, decision making, compensatory approach, non-compensatory approach, survey, mathematical modeling.*

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HUMANITARIAN SUPPLY CHAINS AND COVID-19: SYSTEMS FAILURES AND RECOVERY

Abstract *– During the COVID-19 pandemic, the vulnerability of complex, inter connected and global is ed supply chains was exposed; and humanitarian practitioners around the world experienced long lead times, price hikes, inconsistent quality assurance which impacted their ability to provide adequate and safe humanitarian assistance. How has this changed our sector? What policies helped during severe disruptions? What new technology was used to cope? In this qualitative study, with funding from the Royal Academy of Engineering and the Lloyd's Register, a series of semi-structured interviews have been conducted with humanitarians about their experiences. The findings of these interviews have been analyzed to isolate common coping mechanisms during Feb-Oct 2020. These findings offer a valuable insight into how to improve the policies, processes and preparedness within humanitarian logistics, for both pandemic response and resilient supply chain management. Early policy recommendations are anticipated to be, but not limited to: Localizing and diversifying supply chains, digitizing supply chain management processes, empowering national staff for negotiations with key stakeholders, and the standardization of crisis modifiers and accelerated procurement processes into donor-funded programs.*

Keywords *– Humanitarian logistics, emergency logistics, disaster relief operations, managing supply chain disruptions, emergency procurement, emergencies and crisis logistics.*