2021 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM 2021)

Singapore 13 – 16 December 2021

Pages 1-577



IEEE Catalog Number: ISBN:

CFP21IEI-POD 978-1-6654-3772-1

Copyright © 2021 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP21IEI-POD

 ISBN (Print-On-Demand):
 978-1-6654-3772-1

 ISBN (Online):
 978-1-6654-3771-4

Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com



Table of Contents

SMS-01 Systems Modeling and Simulation 1

A Review on Electric Bus Charging Scheduling from Viewpoints of Vehicle Scheduling Aiying RONG, Shijun CHEN, Dapai SHI, Minsong ZHANG, Chengyong WANG	1
Productivity and Human Factors Improvement in Manufacturing Systems. A Systems Modeling and Simulation Approach Ismail TALEB, Alain ETIENNE, Ali SIADAT	6
Agent-based Modeling as a Tool for Predicting the Spatial-temporal Diffusion of the COVID-19 Pandemic Robert OLSZEWSKI, Agnieszka WENDLAND, Piotr PAŁKA	: 11
Optimization of AGV Dispatching Based on Petri Net Towards Smart Manufacturing System Yaqiong LV, Shangjia XIANG	10
Predicting Dengue Fever Transmission Using Machine Learning Methods Ali SIDDIQ, Nagesh SHUKLA, Biswajeet PRADHAN	2
SCM-01 Supply Chain Management 1	
Supply Chain Learning Through the Online Wood Supply Game: A Sri Lankan Case Study Oshadhi K. HERATH, Banusha ARUCHUNARASA, H. Niles PERERA, R.M. Chandima RATNAYAKE	27
The Delivery Strategy in Cross Docking Operations with Overlapped Temperature Region and Time Windows Constraints Teng-Sheng SU, Thunshun LIAO	32
Economic Evaluation of a Radio Frequency Identification System for a Home Appliance Retail Business Paula FERREIRA, Joana RODRIGUES, Maria do Sameiro CARVALHO	31
Optimizing a Supply Chain Network Using Metaheuristic for Pre and Post Pandemic Scenario Anirban KUNDU, Soudip KARMAKAR, Boby JOHN	4
SMS-02 Systems Modeling and Simulation 2	
Potential of Streamlining Warehouse Processes and IT integration to Increase Implementation of Automation Tine MEIDAHL MÜNSBERG, Lars HVAM	40
Deadlock-solving Traffic Control Methods for Automated Guided Vehicle Systems Maoning CHEN, Canrong ZHANG, Yuangen LU	5
Onomatopoeia Search System Focused on Attributes Based on Sensibility and Various Sounds Ryuta YAMADA, Syohei ISHIZU, Takashi ITO	58
Set of Flexible Models to Support Simulation-based Assembly Planning in SMEs Maximilian DUISBERG, Susanne MÜTZE-NIEWÖHNER, Michael KRANZ, Mostafa KHABBAZAN	63

SCM-02 Supply Chain Management 2

A Cold Chain Vehicle Routing Problem Embedded with Manufacturing, Re-manufacturing and Product Quality Under Multiple Constraints Abdul Salam KHAN, Ali ALARJANI	68
Prioritizing Indicators for Measuring Halal Logistics Implementation Aries SUSANTY, Nia BUDI PUSPITASARI, Sumunar JATI, Silviannisa SILVIANNISA	73
Selecting Temporary Flood Shelter Locations by P-Center Model Wichitsawat SUKSAWAT NA AYUDHYA	78
Optimal Decisions with Supply Disruption and Demand Forecast Updating Meimei ZHENG, Shuangshuang DONG, Qingwei WANG	83
Yard Arrangement Problem with the External Truck Arrival Etsuko NISHIMURA	88
SMS-03 Systems Modeling and Simulation 3	
A Simulation-based Analysis of the Blood Supply Chain During Covid-19 Desti Pinasti PUTRI, Hilya ARINI, Nur Mayke Eka NORMASARI	93
Optimal Sizing and Contracting of Vehicle Fleets Under Uncertainty for Upstream Operations in the Oil and Gas Industry Demian PRESSER, Vanina CAFARO, Diego CAFARO	98
Leveraging Digital Twins for Compatibility Checks in Production Systems Engineering Felix OCKER, Birgit VOGEL-HEUSER, Hauke SCHÖN, Robert MIETH	103
SCM-03 Supply Chain Management 3	
A Review of Dual-channel Supply Chain Management Under Asymmetric Information Wenting HAN, Jianfeng CAI, Chen NAN	108
An Efficient Heuristic for the Two-echelon Multi-vendor Multi-buyer Optimization Problem Nabil NAHAS, Ibrahim NAJUM	113
Enabling Factors of Digital Manufacturing Supply Chains: A Systematic Literature Review W.M. Samanthi Kamari WEERABAHU, Premaratne SAMARANAYAKE, Dilupa NAKANDALA, Hilal HURRIYET	118
Innovative and Sustainable Supply Chain Model in Industry 4.0 Based on Moroccan Industrial Field Ahmed EL MAALMI, Kaoutar JENOUI, Laila EL ABBADI	124
SCM-07 Supply Chain Management 7	
A Sustainable Supply Chain Inventory Model with All-units Quantity Discount and Shipping Weight Iwan VANANY, Ivan Darma WANGSA, Nurhadi SISWANTO	129
E-Commerce: Challenges That Lies Ahead of the Future Air Cargo Operation Tipavinee Suwanwong RODBUNDITH, Narat HASACHOO, Pornwasin SIRISAWAT	134

Blockchain-driven Supply Chain Finance – A Structured Review Lorenz TRAUTMANN, Rainer LASCH	138
Smart Retail Adaptation Framework for Traditional Retailers: A Systematical Review of Literature Muriani Emelda ISHARYANI, Bertha Maya SOPHA, Muh. Arif WIBISONO, Benny TJAHJONO	143
SCM-04 Supply Chain Management 4	
Exploring Critical Events of Perishable Product Supply Chain Using Fault Tree Methodology to Deal with Impacts of COVID-19 Manisha BHARDWAJ, Rajat AGRAWAL	148
Coordination of Supply Chain of a Three-level Fresh Products Based on Conditional Value at Risk Chen NAN, Jianfeng CAI, Wenting HAN	153
Sustainability Issues of the Coconut Supply Chain in Indonesia Dian TRIHASTUTI, Ivan GUNAWAN, Jaka MULYANA	158
A Conceptual Paper on Supplier Unilateral Specific Investment Antecedent: Social Capital Perspectives Wulan PERMATASARI, Amin WIBOWO, Rangga ALMAHENDRA, Nurul INDARTI	163
Evaluation of Supply Chain Network Resilience Level in Pre-disruption and Post-disruption Scenario Nur Aini MASRUROH, Muhammad Fernanda LUTHFIANSYAH	167
SCM-08 Supply Chain Management 8	
The Mechanisms of Co-innovation in the Development of Bioplastic Packaging: Evidence from Practice Benny TJAHJONO, Liliani, Dongmei CAO	172
An Integrated Inventory Problem with Transportation in a Single-vendor Multiple-buyer Supply Chain Coordination with Stochastic Demand *Ibrahim A. ALRAJEH, Mustafa Y. ALABANDI, Mohammad A.M. ABDEL-AAL*	177
A Simulative Study of an In-plant Frozen Period for Demand-based Material Supply in Matrix Manufacturing Systems Daniel MUELLER, Christoph GANβ	185
Do Listed Ocean Tanker Companies Have Operational Skill? Empirical Evidence from Fleet and Voyage Data Roar ADLAND, Tord ENGEN	190
Improving the Strategic Distribution Performance of the Supply Chain of a Leading FMCG Company: A Case Study Khaled S. ABDALLAH, Yasmin ADEL, Shady MOSTAFA	195
Integrated Repair Shop Scheduling and Spare Parts Pooling for Robust Product Regeneration Torben LUCHT, Anja WOJCIK, Peter NYHUIS	200
SCM-05 Supply Chain Management 5	
Extending the Last Mile Delivery Routing Problem for Enhancing Sustainability by Drones Using a Sentiment Analysis Approach Omid FATAHI VALILAL Elliam AHMADI. Hendro WICAKSONO	207

Application of Value Stream Mapping in Supply Chain: A Case Study on an Amazon Retail Hongrui LIU, Yanfang QIN	213
Redistribution Problem with Excess and Shortage in Relief Supplies Etsuko NISHIMURA, Sima YING	218
Optimal Consumption Subsidy Strategy of a Green Supply Chain Under the Cap-and-trade Mechanism <i>Zhimin LI, Wen YANG, Yanchun PAN, Jianhua MA</i>	223
Automated Truck Scheduling Utilizing an AI Expert System: An Innovative Solution for Digital Freight Forwarders and Carriers Stanislav CHANKOV, Luis Enrique VELÁZQUEZ	228
Supply Chain Management and Resilience During Disruption. Evaluation of the Covid-19 Pandemic on the Supply of Personal Protective Equipment Alan PILKINGTON, Marco CUVERO CALERO, David BARNES	233
SCM-09 Supply Chain Management 9	
Data-driven Planning in the Face of Supply Disruption in Global Agricultural Supply Chains Marie Pelagie ELIMBI MOUDIO, Cristobal PAIS, Zuo-Jun (Max) SHEN	238
State of Supply Chain Finance for Micro, Small and Medium Enterprise in India Hariprasad AMBADAPUDI, Rajesh MATAI	243
Research on the Optimal Strategy of Delivery Packaging Recycling Under Policy Support Ming WU, Xin LI, Yan CHEN	249
Supply Chain Vulnerability and Collaborative Management Empowered by Emerging IT: An Analysis from China's Practice Xiaorui DU, Zhaojun YANG, Jun SUN, Mengdi WU	254
The Role of SKU Management in SKU Rationalisation Projects Aleksandra STASKIEWICZ, Anders HAUG, Lars HVAM	259
Logistical Potentials of Load Balancing via the Build-up and Reduction of Stock Tammo HEUER, Tim Daniel BUSSE, Matthias SCHMIDT, Janine Tatjana MAIER, Peter NYHUIS	264
SCM-06 Supply Chain Management 6	
Inter-island Logistics and the Role of an Agile Supply Chain to Achieve Supply Chain Performance: Initial Findings Firdaus ALAMSJAH, Muhammad ASROL	270
Degree of Centralization: Impact on the Economic Efficiency by Considering Different Waste Types Tino Xaver SCHLOSSER, Günther SCHUH, Andreas GÜTZLAFF, Julian AYS, Markus REY	275
Simulating the Impact of COVID-19 Scenarios on Air Freight Logistics Supply Chain Rosalin SAHOO, Bhaskar BHOWMICK, M. K. TIWARI	280
Critical Success Factors in Adopting Short Food Supply Chain Practices Under COVID-19: A Sri Lankan Case Study W.M. Samanthi, Kamari, WEERABAHU, Dasun Nirmala MALAARACHCHI, Premaratne SAMARANAYAKE	284

Developing Game Models for Service Composition to Improve Customization in the Equilibrium State Based on Cloud Manufacturing System Ehsan VAZIRI GOUDARZI, Mahmoud HOUSHMAND, Vahidreza GHEZAVATI, Shahrouz BAMDAD, Omid FATAHI VALILAI	289
HSM Healthcare Systems and Management	
PDMS-based RF Resonant Sensor for Measuring the Concentration of Micro-Plastics JinHyoung KIM, Cheolung CHA, Yongtaek HONG, KwonHong LEE	293
A Mathematical Formulation for Reducing Overcrowding in Hospitals' Waiting Rooms Giulia CASELLI, Manuel IORI, Maxence DELORME, Daniele DE SANTIS	297
Analyzing the Interactions Among the Barriers for Safe and Effective Medical Waste Management Sasikumar PERUMAL, Amal HAMED ALJEFRI, Reem HARIB ALSAIFI	302
Pre-determined Package Sizes and Large Neighborhood Search Approach for Medical Supplies Vehicle Routing Problem of Primary Care System in Thailand Rawinkhan SRINON, Sarita KRONGYOTH	308
Application of Simulation Technique in Improvement of Intra-hospital Patient Transfer: A Provincial Hospital Center in Northern Thailand Tinnakorn PHONGTHIYA, Chompoonut KASEMSET, Sichaphat POOMSUK, Worapol LERTCHAROENPAISAN	314
DAM-01 Decision Analysis and Methods 1	
An ADS-B Aided Dynamic Traffic Alert for Robust Safety Assessment in Controlled Airspace Kam K.H. NG, Cho Yin YIU, Tsz Kin TAM	319
Application of Analytical Hierarchy Process to Inventory Management Practices in a Food Processing Industry in Lagos State, Nigeria Akinlo MOGBOJURI, Oludolapo OLANREWAJU, Temitope OGUNLEYE	324
Constructing a Composite Indicator for Manufacturing Companies Using Lean Metrics and Analytic Hierarchy Process Willy ZALATAR, Eppie CLARK	328
A Comparative Analysis of the Impact-Wave Analogy Cyber-Resilience Framework Daniel A. SEPULVEDA-ESTAY, James K. OSBORN	333
Using Network Analysis to Evaluate Dynamic Capabilities: A New Concept of Method Desmond WONG, Shan Shan TAN	338
Hydropower Replacement and the Nexus of Food-Energy-Water Systems: Impacts on Climate Performance Dor HIRSH BAR GAI, Ekundayo SHITTU	344
TKM-04 Technology and Knowledge Management 4	
Consideration on Sustainable Development of Companies and Society: Research on an Approach to Creating Shared Value Haru SUZUKI, Masaru ISHIOKA	349

Product Development in the Automotive Industry in the Context of Industry 4.0 - A Bibliometric Analysis <i>Julia BRAUN, Magdalena MISSLER-BEHR</i>	354
The Current State of EV Readiness in Indonesia: Assessing the Industrial Sector's Perspective with J-TRA Methodology Andante Hadi PANDYASWARGO, Meilinda Fitriani Nur MAGHFIROH	361
Influencing Factors on the Adoption of Face Recognition Technology on Campus Based on SEM Danping LIN, Chan YUAN, Zhijian CHEN	367
DAM-02 Decision Analysis and Methods 2	
Developing Framework for the Implementation of MSP for Indian Farmers Using Integrated ISM and MICMAC Approach Amit Kumar GUPTA, Narain GUPTA	372
Lexical Semantic Analysis to Support Ontology Maintenance Modeling of FMEA Vahid EBRAHIMIPOUR	377
A Weighted Subjective Skyline Approach for World University Ranking Systems Junyi CHAI, Wenbin LIU	383
TKM-05 Technology and Knowledge Management 5	
Dynamic Service Innovation Capabilities in the Digital Age: An Integrated Research Framework and Key Research Questions Shun ZHANG, Jun ZHAN, Fuhong WANG	388
Failure Knowledge-sharing Motivation with Self Determination Theory – Evidence from a Japanese Company Sanetake NAGAYOSHI, Jun NAKAMURA	394
Visualizing the Evolution of Reverse Knowledge Transfer Research: A Bibliometric Analysis Based on Citespace Junlin ZHU, Suli ZHENG, Xiao SUN	399
Digital Supply Chain in the Food Industry: Critical Success Factors and Barriers Meenakshi SUBRAMANIYAM, Sarina Abdul HALIM-LIM, Siti Fatimah Binti MOHAMAD, Anjar PRIYONO	404
Big Data Analysis for Predicting Future Skills Arnesh TELUKDARIE, Megashnee MUNSAMY, Mabatho GAULA	411
DAM-03 Decision Analysis and Methods 3	
Factors Affecting Consumer Acquisition of Secondhand Smartphone in Indonesia Nur Aini MASRUROH, Diana Puspita SARI, Anna Maria Sri ASIH	416
Prioritization of Pipe-Bending Manufacturing Methods: An AHP-based Techno-Economic Comparison Between Welding and Cold Bending Ine SKIBENES, R.M. Chandima RATNAYAKE	421
The STIC Analysis: A Decision Support Method for Investments in Automation Mert METE, Marco BONINI, Tuan NGUYEN, Augusto URRU, Wolfgang ECHELMEYER	427

Automation? Yes But Where to Begin? Tuan NGUYEN, Marco BONINI, Jasmine Eva LANGENBAHN, Eric Alexander SCHNEEWEIS, Sabrina MOSER, Augusto URRU, Wolfgang ECHELMEYER	435
Supervised Machine Learning in Detecting Patterns in Competitive Actions Laura VALTONEN, Saku J. MÄKINEN, Johanna KIRJAVAINEN	442
Challenges of Modular Product Families and Product Personalization - An Interview Study Juliane KUHL, Selin ÜRETEN, Dieter KRAUSE	447
DAM-04 Decision Analysis and Methods 4	
Extreme Learning Machine for Short and Mid-term Electricity Spot Prices Forecasting Ana Paula BARROSO, Teresa MARQUES, Inês TEIXEIRA	452
An Analysis of Social Sustainability Indicators Using FITradeoff Multicriteria Decision Method Luciana HAZIN ALENCAR, George PASSOS NETO, Emilia R. Kohlman RABBANI, Rodolfo VALDES-VASQUEZ	457
Comparing Statistical and Machine Learning Methods for Sales Forecasting During the Post-promotional Period H. Niles PERERA, Harsha CHAMARA HEWAGE	462
A Multicriteria Group Decision-making Model for Selecting a Perishable Food Packaging System Using an Outranking Method Over M. CAUSIL, Danielle C. MORAIS	467
TKM-01 Technology and Knowledge Management 1	
Can a Computer-based Knowledge Repository Strengthen Organizational Memory? Evidence from a Japanese Company Sanetake NAGAYOSHI, Jun NAKAMURA	472
Reasons for Engineering Changes Affecting Part-specific Tools: An Investigation in the Automotive Industry	477
Markus Johannes KRATZER, Lukas BAUCH, Torsten BURKERT, Blanka SZOST, Thomas BAUERNHANSL	
Improving the Keyword Co-occurrence Analysis: An Integrated Semantic Similarity Approach Atanu BHUYAN, Himanshu SHARMA, Kamal SANGURI	482
Development of a Balanced Score Card for Knowledge Work in Project-oriented Engineering Organization: KPI Prioritization Using AHP Daria LARSSON, R.M. Chandima RATNAYAKE, Arne GILDSETH	488
The Impact of Covid-19 on Blockchain Adoption Time of Shipowners Shuyi PU, Jasmine Siu Lee LAM	494
Identification of Fields of Action for the Realization of a Sustainable Corporate Management Carsten BOβMANN, Michael RIESENER, Maximilian KUHN, Sebastian SCHLOESSER, Günther SCHUH	498
DAM-05 Decision Analysis and Methods 5	

Conceptual Model for Understanding the Impacts of COVID-19 Pandemic on Jakarta Mid-term Development Goals Using System Dynamics Approach Irvanu RAHMAN, Zahra ZAHRA, Teuku Naraski ZAHARI	508
A Combined Evaluation Model for Competitiveness Assessment of Private Science and Technology Parks in China Zhuoran LI, Yuming ZHU, Xiaohai WENG, Qingye HAN, Fen LYU	513
A Systematic Way of Crafting Strategies for Private Science and Technology Parks Lei HE, Yuming ZHU, Xiaohai WENG, Qingye HAN, Fen LYU	518
A Hybrid Multiple Attribute Decision-Making Method Based on Mahalanobis-Taguchi System and Choquet integral Mingzhen ZHANG, Naiding YANG, Xianglin ZHU	523
TKM-02 Technology and Knowledge Management 2	
A Survey of Challenges and Response Strategies of Manufacturing Companies During the Covid-19 Pandemic S.C. Johnson LIM	528
The Evaluation Model of Enterprises' Digital Transformation Competence Based on the Grey Cluster Method Fen LYU, Yuming ZHU	533
How to Better Identify and Mitigate Risks in Call for Tenders: Towards a Dedicated Risk Ontology Elise VAREILLES, Michel ALDANONDO, Thierry COUDERT, Laurent GENESTE, Rania AYACHI	538
Methodology for Organizing Product-service System Provision in Corporate Value Networks Julian KRESS, Michael RIESENER, Maximilian KUHN, Günther SCHUH, Jakob TÖNNIS	542
Transfer of Industrial Product-service System Specific Risk Effects to Value Network Partners – Concept for an Integrated Risk Assessment and Distribution *Julian KRESS, Maximilian KUHN, Günther SCHUH, Michael RIESENER, Lukas SCHILD*	547
DAM-06 Decision Analysis and Methods 6	
Application of the Multistage One-shot Decision-Making Approach to an IT Project in the Central Bank of Oman Mohammed ALSHANFARI, Peijun GUO	552
A Reinforcement Learning Approach for Optimization of E-bus Off-normal Schedule with Time Windows Jiguang WANG, Jinhui WEN, Yi ZHANG, Zhide LI, Wai Kin (Victor) CHAN, Xinglu LIU	558
Evaluation of the Innovation Level for Technological Enterprises: Multi-attribute Decision-making Based on Vague Sets Xianglin ZHU, Naiding YANG, Mingzhen ZHANG	563
Borrowing Money Matching Model Research in the P2P Platform Kenan LI, Yan CHEN, Xin LI	568

TKM-03 Technology and Knowledge Management 3

Innovation Model of Basic Research Teams Oriented to Disruptive Technology Yi LIU, Xin ZHENG	573
Integration of Ontologies and Constraint Satisfaction Problems for Product Configuration Maryam MOHAMMAD AMINI, Thierry COUDERT, Elise VAREILLES, Michel ALDANONDO	578
Utilization of Industry 4.0 During COVID-19 Pandemic in the Targeted (S-Curve) Industries of Thailand Aunchalee TAWEETHAVORNSAWAS, Yotsuda BURANASING, Manutchanok JONGPRASITHPORN, Nantakrit YODPIJIT	583
Applications of Industry 4.0 During COVID-19 Situation for Thailand's Logistics System in Customer Satisfaction Context Yotsuda BURANASING, Manutchanok JONGPRASITHPORN, Nantakrit YODPIJIT	588
To Support or Not to Support the Innovation? A Preliminary Study on the Effect of Family Ownership in Board on Innovation in Taiwan Family Firms Jung-Ching LIN	593
What is Actually Measured? Investigating the Correspondence Among Goals and Performance Indicators in a Swedish Municipality Annika HASSELBLAD	598
OR-04 Operations Research 4	
Time Window Based Genetic Algorithm for Multi-AGVs Conflict-free Path Planning in Automated	603

Time Window Based Genetic Algorithm for Multi-AGVs Conflict-free Path Planning in Automated
Container Terminals

603

Tong LU, Siqi QIU, Zhao-Hui SUN, Xinguo MING

Literature Review of Risk Communication on Public Perceptions in Responding to Covid-19 with a System 608 Dynamic Approach

Anggraini SAPUTRI, Hilya ARINI

Analysis of Renewable Energy Adoption Efficiencies Under Uncertainty Across Electricity Markets in the 613 U.S.

Olawale OGUNRINDE, Ekundayo SHITTU

MS-01 Manufacturing Systems 1

Sustainable Multi-objective Process Plan Generation in RMS: Dynamic NSGA-II vs New Dynamic NSGA- 618 II

Lyes BENYOUCEF, Khettabi IMEN, Mohamed-Amine BOUTICHE

Addressing the Semantic Gap in the Consumer-to-manufacturer Strategy Using Dual Convolutional Neural 624 Network

Yue WANG, Xiang LI

Decision Support by Interpretable Machine Learning in Acoustic Emission Based Cutting Tool Wear
Prediction

629

Arno SCHMETZ, Christopher VAHL, Zhen ZHEN, Daniel REIBERT, Sebastian MAYER, Daniel ZONTAR, Christian BRECHER, Jochen GARCKE

An Appropriateness Analysis for Additive Manufacturing Based on a Global Performance Index Dinh Son NGUYEN	634
Exploring Barriers for Software Development in Agile and Integrated Development of Production Systems Dag RAUDBERGET, Julia TROLLE, Carin RÖSIÖ	639
Representing Control Software Functionality as Part of a Modular, Mechatronic Construction Kit Eva-Maria NEUMANN, Birgit VOGEL-HEUSER, Ibrahim BAYAR	644
OR-05 Operations Research 5	
Collaborative Vehicle Dispatching for Resilient and Fair Emergency Response Yuying LONG, Ying SUN, Gangyan XU, Pengfeng SHU	649
MS-02 Manufacturing Systems 2	
Increased Efficiency in a Garment Sector by the Integration of Lean Manufacturing Tools Jose C. ALVAREZ, Hilton FLORES, Lesly PAUCAR, Eloy MARCELO LASTRA, Percy CASTRO	654
Digital Lean Manufacturing: A Literature Review Daryl POWELL, David ROMERO	659
Process Chain Concept for the Automated Design of Polymer Additively Manufactured Forming Tools Philipp BICKENDORF, Günther SCHUH, Georg BERGWEILER, Arne PASSGANG, Falko FIEDLER	663
Proposal of Work Standardization to Improve a Metal-mechanical Process Jose C. ALVAREZ, Lucy CASALLO, Fernando MARADIEGUE, Elizabeth LUCERO	668
An Iterative Scheme for Hierarchical Production Planning in Semiconductor Wafer Fabrication Rajarshi BARDHAN, Chi XU, Puay Siew TAN, Zhiguang CAO	673
OR-06 Operations Research 6	
Dynamic Vehicle Routing for Battery Swapping in an Electric Bike-sharing System Yaoming ZHOU, Yi YANG, Tanmoy KUNDU, Suxiu XU	678
Truck Departure Optimization from Distribution Center to Parcel Locker with Stochastic Demand Arrival Wenjia ZENG, Mingyao QI, Xia YANG	683
A Heuristic Algorithm for Time-dependent Bus Scheduling Problem Yi ZHANG, Jiguang WANG, Xinglu LIU, Wai Kin (Victor) CHAN, Feng LI, Zhide LI	688
A Single Non-obnoxious Facility Location Selection for Utility Stores Corporation Using Center of Gravity and P-median Methods Li ZHANG, Muhammad HANIF, Nasir MUJTABA, Jiacheng LI, Abdul HAKIM SHAH, Saif ULLAH	693
MS-03 Manufacturing Systems 3	
Case Study of Digital Twin-based Human-robot Collaborative Work-cell for Satellite Assembly Yichen WANG, Jindan FENG, Junfeng WANG, Jinshan LIU, Xiaojun LIU	698

Control of Shared Production Buffers: A Reinforcement Learning Approach Christoph SCHWINDT, Nora KRIPPENDORFF	703
Adapted IOBPCS Model to Analyze the Impacts of Capacity Scalability on Inventory in a Reconfigurable Manufacturing Environment Lyes BENYOUCEF, Abdelhak DAHMANI	708
Comparison of Two Concepts for Planned Reuse of Variant-rich IEC 61131-3-based Control Software Juliane FISCHER, Birgit VOGEL-HEUSER, Anja BERSCHEIT, Simon PARIGGER	713
Towards a Method to Design Production Systems for Fixtureless Production with Component-integrated Fixture Features in Automotive Body Shops Falko FIEDLER, Peter BURGGRÄF, Georg BERGWEILER	721
MS-04 Manufacturing Systems 4	
Implementation of Lean Production for Achieving Low-cost Product: A Case Study of ABC Company <i>Jonny JONNY</i>	729
Event Log-based Weaknesses Detection in Business Processes Marco SCHOPEN, Günther SCHUH, Andreas GÜTZLAFF, Seth SCHMITZ, Florian BRÖHL	734
Development of a Model to Evaluate the Potential of 5G Technology for Latency-critical Applications in Production Raphael KIESEL, Falk BOEHM, Jan PENNEKAMP, Robert SCHMITT	739
Development of New Univariate Process Capability Index for Multistage Wheel Manufacturing System Subham KUNDU, Subhas Chandra MONDAL	745
Management Framework for the Highly Iterative and Integrated Product and Production Process Development (HIP³D) Shari WLECKE, Günther SCHUH, Andreas GÜTZLAFF, Seth SCHMITZ, Annkristin HERMANN	750
OR-01 Operations Research 1	
Manufacturers Insights on the Implementation of Eco-industrial Park Ai Chin THOO, Jin Ming NGANG, Hon Tat HUAM, Mohamed Syazwan Ab TALIB	755
Proposal of Work Study and Anthropometric Workstation Redesign to Increase the Productivity on Asparagus Industries Jose C. ALVAREZ, Carolina GARCIA, Ana MARROQUIN, Iliana MACASSI	760
Robust Network Design and Last-mile Delivery in Cold Chain Logistics System Ying YANG, Mingyao QI, Yongsen ZANG	765
Applying Multiple Stakeholder-based Target-oriented Robust-optimization Approach in the Microbusiness Sector <i>Miriam BONGO, Eunice Cristyl DEL PILAR</i>	773
A New Discrete Bi-objective Formulation of Unequal Area Facility Layout Problem Rajesh MATAI, R.R.K. SHARMA, Vinay SINGH, Surya SINGH, Trinika KAUSHIK	778
Mixed-energy Fleet Pollution-routing Problem with Time Windows Xuan REN, Shuo FENG, Xing WU, Jun QI	783

MS-05 Manufacturing Systems 5

A Re-evaluation of the Initial Mathematical Model for Triangular Pocket Machining Strategy Apriani SOEPARDI, Mochammad CHAERON	788
Enabling Robust Service Composition in Cloud Manufacturing with Sustainability Considerations Majid SODACHI, Mohammed Tousif HYDER, Carol LOBO, Tharun Sai MADUPURU, Samarth SUDARSHAN, Omid FATAHI VALILAI	792
A Distinctive Real-time Information for Industries and New Business Opportunity Analysis Offered by SAP and AnyLogic Simulation Majid SODACHI, Nawadeep ADHIKARI, Tarique AMEER, Ganesh Kumar DHAKSHINAMOORTHI, Santhosh GANESAN, Omid FATAHI VALILAI	796
Consumer Product Repetitive Production Planning with Color Sequence Wheel to Reduce Total Changeover Time Rawinkhan SRINON, Thanyalak BOONKANOK	801
Utilization of the Asset Administration Shell for the Generation of Dynamic Simulation Models Denis GÖLLNER, Thomas PAWLIK, Thomas SCHULTE	808
Process Plan Generation in Reconfigurable Manufacturing System Composed of Multi-spindle and Modular Reconfigurable Machines Mohammed DAHANE, Muhammad AMEER	813
OR-02 Operations Research 2	
The Least-distance DEA Based Efficiency Improvement Under Multiple Perspectives Xu WANG, Takashi HASUIKE	818
A Two-stage Robust Model for Urban Food Waste Collection Network Under Uncertainty Ke XU, Meimei ZHENG, Xiao LIU	824
Challenge and Obstacles to Promote Sustainable Remanufacturing: A Cross Case Analysis Mohamad Fariz MOHAMED NASIR, Abdul Rahman ABDUL RAHIM, Anies Faziehan ZAKARIA, Azfarizal MUKHTAR	829
A New Mixed Integer Linear Programming Formulation for Dynamic Facility Layout Problem Rajesh MATAI, Surya SINGH	834
MS-06 Manufacturing Systems 6	
A Study of the Inspection Support Tool Development Using the Neural Network Harumi HARAGUCHI, Riku AKAISHI	839
Sample Extraction of a Quality Inspection Tool for Dental Parts Manufacturing Industry Harumi HARAGUCHI, Riku AKAISHI	843
Digital Twin-enhanced Approach for Supply Chain Disruption Management in Manufacturing Shop Floors Alejandro SEIF, Kendrik Yan Hong LIM, Nimisha AGARWAL, Nam Tuan LE	848

Simulation-based Design of a Pull Material Supply System for Low Volume Unpaced Assembly Lines: A Case Study in the Aerospace Industry Sebastian EBERLEIN, Susanne SCHUKRAFT, Michael FREITAG	853
OR-03 Operations Research 3	
Minimizing Paper Waste and Setup Costs in Offset Printing Philipp BAUMANN, Manuel KAMMERMANN, Silvan ELSAESSER	858
An Auction-based Mechanism for the Formation and Scheduling of Heterogeneous Human-machine Teams Felix MERZ, Christoph SCHWINDT, Stephan WESTPHAL, Juergen ZIMMERMANN	863
The Robust Optimization Approach for the Community Group Purchase Joint Order Fulfillment and Delivery Problem Xia YANG, Wenjia ZENG, Canrong ZHANG	869
OR Optimization in the Authorities, Business and Citizens Triangle - Application of Cooperative Game Theory and Spatial Information Modeling Robert OLSZEWSKI, Piotr PAŁKA, Agnieszka WENDLAND	875
Determinants of When-to-evacuate Decisions: An Empirical Investigation Bertha Maya SOPHA, Karindra Aulia RAHMAN	880
PM-01 Project Management 1	
Key Roles of the Full Life Cycle of the "Internet +" Environmental Public Welfare Projects Liaoliao LI, Guoying TANG, Yali ZHANG, Jun SUN	885
How Does the Text Sentiment Tendency Affect the Fundraising Effect of Digital Environmental Protection Public Welfare Projects? ——Moderating Effect of Projects' Information Delin CHEN, Yali ZHANG, Haixin ZHANG	890
Implementation of Last Planner System to Engineering-to-order (ETO) Organization with a Focus on Office Knowledge Work. Development of a Framework <i>Daria LARSSON, R.M. Chandima RATNAYAKE</i>	895
Circular Economy Strategies in Civil Engineering: A Brief Literature Review Sassha RICO, Luciana HAZIN ALENCAR	901
SIM-01 Service Innovation and Management 1	
Framework Development for Sustainable Manufacturing Cloud Service Composition System (SMCS) Based on Axiomatic Design Ehsan VAZIRI GOUDARZI, Mahmoud HOUSHMAND, Vahidreza GHEZAVATI, Shahrouz BAMDAD, Omid FATAHI VALILAI	906
Are Older Adults Different in Their Perspectives on Age-friendly City? Evidence From Sunway City Pei-Lee TEH, Shaun Wen Huey LEE, Ewilly Jie Ying LIEW, Elizabeth LEE, Qasim AYUB	910
Modelling Water Network Behaviors: Agent-based Modelling Arnesh TELUKDARIE, Chuks MEDOH	915

Procurement System Influences the Size of In-house Team and Effectiveness in Infrastructure Dev	elopment 920
Edoghogho OGBEIFUN, Jan Harm PRETORIUS	

925

PM-02 Project Management 2

Feature Based Statistical Model of Employee Productivity with Real Time Checked Data Jalaja SHANMUGALINGAM, Yongsheng MA, David LARIO	925
Comparison of Stabilities for Open Source Project Yoshinobu TAMURA, Hironobu SONE, Shigeru YAMADA	933
Organisational Learning and Uncertainty Reduction in Innovation Projects: The Moderating Effects of Innovation Project Types *Rola FANOUSSE*, Dilupa NAKANDALA*, Yi-Chen LAN	937
Analysis on the Cooperative Innovation Behavior and Stability of Inter-organizational R&D Project Based on Evolutionary Game Xiaoxia HUANG, Peng GUO, Xiaonan WANG, Ding WANG	942
PPC-02 Production Planning and Control 2	
Application of Value Analysis and Engineering to the Design and Production of Concrete Barrier Mark Anthony SANTIAGO, Maria Victorina RADA, Ma. Janice GUMASING	947
Analysis and Measurement of Overall Equipment Effectiveness (OEE) Values of the CNC Cutting Machine at PT. XYZ Decky Antony KIFTA, Nilda Tri PUTRI	953
Push Sell Through Surplus Inventory Sandeep JAIN, Nisha KUMARI, Suraj DROLIA, Shyam BHASKAR	959
Mathematical Modeling of Master Production Schedule with Campaign Planning Constraints Devanand R, Tushar SHEKHAR, N HEMACHANDRA, Ashutosh MAHAJAN	964
Imperfect Preventive Maintenance Scheduling with Partial Outsourcing Option Considering Production Constraint Danping LIN, Minxin JI, Haoran LI	969
PM-03 Project Management 3	
Analysis of the Perspectives of the Stakeholders in Sustainability Management in Civil Construction: A Literature Review Luanda LIMA, Luciana HAZIN ALENCAR, Marcelo ALENCAR	974
A Comparative Performance Analysis of Two MILP Formulations for the Re-source-Renting-Problem Max REINKE, Juergen ZIMMERMANN	979
Improving Information System Development and Maintainability Factors Through Standardized Processes: An Empirical Study <i>Younes BENSLIMANE, Zijiang YANG, Eric LIU</i>	984
Creating Business Domain Concepts in Regional Projects: In the Case of Japan Makoto TANIFUJI, Keisuke UENISHI	989

Risk Assessment Camilo MICAN, Gabriela FERNANDES, Madalena ARAÚJO	994
Project-oriented Selection of Agile Methods for the Design of Physical Products Julian BASCHIN, David SCHNEIDER, Tobias HUTH, Thomas VIETOR	999
BDA-01 Big Data and Analytics 1	
Industry 4.0 and its Technologies: A Systematic Literature Review Sharfuddin Ahmed KHAN, Eman ALAREF	1004
A Machine Learning Predictive Model for Shipment Delay and Demand Forecasting for Warehouses and Sales Data Kin Lok KEUNG, Carman Ka Man LEE, Yuk Hin YIU	1010
Hand Gesture Recognition with Augmented Reality and Leap Motion Controller Kin Lok KEUNG, Carman Ka Man LEE, Jiage HUO, Hiu Yin NG	1015
Active Machine Learning in Regression Problems Juris LAPSINS, Sarma CAKULA	1020
A Feature Ensemble Model for Material Rate Prediction in Chemical Mechanical Planarization Rui WANG	1024
Early Warning Model of Wind Turbine Front Bearing Based on Conv1D and LSTM Shihui ZHANG, Yajie LIU, Tao ZHANG	1029
SIM-02 Service Innovation and Management 2	
Research on Customer Market Segmentation of Electric Vehicle Rental Sites Based on Latent Class Modeling Peng GUO, Hao HU, Rui MIAO, Bo ZHANG	1035
Modeling	1035 1040
Modeling Peng GUO, Hao HU, Rui MIAO, Bo ZHANG Wellness Tourism Destination Assessment Model: A Development Indicator in an Emerging Economy—	
Modeling Peng GUO, Hao HU, Rui MIAO, Bo ZHANG Wellness Tourism Destination Assessment Model: A Development Indicator in an Emerging Economy— Thailand	1040
Modeling Peng GUO, Hao HU, Rui MIAO, Bo ZHANG Wellness Tourism Destination Assessment Model: A Development Indicator in an Emerging Economy— Thailand Thadathibesra PHUTHONG, Pongpun ANUNTAVORANICH, Achara CHANDRACHAI, Krerk PIROMSOPA Research on the Impact of Network Embeddedness on Enterprise Innovation Performance Based on the Mediating Role of Business Model Innovation and the Moderating Role of Competition Intensity	1040
Modeling Peng GUO, Hao HU, Rui MIAO, Bo ZHANG Wellness Tourism Destination Assessment Model: A Development Indicator in an Emerging Economy— Thailand Thadathibesra PHUTHONG, Pongpun ANUNTAVORANICH, Achara CHANDRACHAI, Krerk PIROMSOPA Research on the Impact of Network Embeddedness on Enterprise Innovation Performance Based on the Mediating Role of Business Model Innovation and the Moderating Role of Competition Intensity Guoqing LI, Qingfeng TIAN, Rui XU Smart Product Service Requirements Identification and Evaluation: A Hybrid Method	1040 1047
Modeling Peng GUO, Hao HU, Rui MIAO, Bo ZHANG Wellness Tourism Destination Assessment Model: A Development Indicator in an Emerging Economy— Thailand Thadathibesra PHUTHONG, Pongpun ANUNTAVORANICH, Achara CHANDRACHAI, Krerk PIROMSOPA Research on the Impact of Network Embeddedness on Enterprise Innovation Performance Based on the Mediating Role of Business Model Innovation and the Moderating Role of Competition Intensity Guoqing LI, Qingfeng TIAN, Rui XU Smart Product Service Requirements Identification and Evaluation: A Hybrid Method Ziding MENG, Zhihua CHEN, Zhao-Hui SUN, Xinguo MING Optimal Pricing for Online Delivery Platforms with Group Buying and Direct Delivery	1040 1047 1052

A Data Mining Approach for Analyzing Dynamic User Needs on UGC Platform Yuning QIAN, Danni CHANG, Zhen ZHANG, Xinyu ZHU, Fanxing ZOU	1067
Proposal of an Onomatopoeia Feature Table Using Cosmetic Reviews Misaki MURATA, Syohei ISHIZU, Takashi ITO	1072
Creating Transparency on Product Variety Through Data-driven Similarity Analysis Marius KRUG, Andreas GÜTZLAFF, Matthias SCHMIDHUBER, Günther SCHUH	1077
Comparing Technical Trends Between Industrial Leaders via Video Data Shino IWAMI	1082
SIM-03 Service Innovation and Management 3	
Value Co-creation Building to Sustain Indonesian MSMEs in the New Normal Era Christina WIRAWAN, Jahja Hamdani WIDJAJA	1087
Developing an Implementation Framework for Automated Customer Support Service in Collaborative Customer Relationship Management Systems Madeline TEE, Richard LI	1092
Hoshin Kanri and Portfolio Kanban Management: A Conceptual Framework for Strategic Management in the Public Sector Felix P. SANTHIAPILLAI, R.M. Chandima RATNAYAKE	1097
Business Models and Product-Service System Design – Introducing the Business Model Graph Christoph RENNPFERDT, Dieter KRAUSE, Florian M. DAMBIETZ	1102
Business Model for Post-industrial Tourism from a System Dynamics Perspective Monica LEBA, Andreea IONICA, Ionela SAMUIL	1107
BDA-03 Big Data and Analytics 3	
Exploratory Data Analysis of the N-CMAPSS Dataset for Prognostics Arvind KEPRATE, Supratik CHATTERJEE	1114
Modelling Big Data Analytics Adoption: An Indonesian Case Jonny JONNY, Kriswanto KRISWANTO	1122
Modeling IoT and Big Data Impacts to Business Performance Jonny JONNY, Kriswanto , Matsumura TOSHIO	1127
Contractual Obligations and Vessel Speed: Empirical Evidence from the Capesize Drybulk Market Roar ADLAND, Vit PROCHAZKA	1132
Condition Based Maintenance in Nuclear Power Plants: Limitations & Practicality Rajinder KHURMI, Karthik SANKARANARAYANAN, Glenn HARVEL	1137
CIM 04 Coming Language and Management 4	

SIM-04 Service Innovation and Management 4

Understanding the Linkage Between Social Innovation and Sustainable Development Goals: Some Insights 1142 of Field Research

Jorge CUNHA, Carla FERREIRA, Madalena ARAÚJO, Manuel NUNES, Paula FERREIRA

Thinking Together Industry 4.0 and Social Innovation: How Digital Technologies Impact on Social Change? Jorge CUNHA, Wellington ALVES, Madalena ARAÚJO, Enrique ARES	1147
An Empirical Study to Scrutinize the Interplay Between Safety and Sustainable Production Performance in the Context of Chemical Industry Benny TJAHJONO, Danu Hadi SYAIFULLAH, David MCILHATTON, Teuku Yuri M. ZAGLOEL	1152
Risk-averse Oil-spill Response Planning Hassan SARHADI, Zhen LIU	1157
Redesign of Glasses Customization Service Process Based on Analysis of Influencing Factors in Customer Purchase Decision-making Process Jingjing WANG, Wen LUO, Chen WANG, Zhelin LI	1164
BDA-04 Big Data and Analytics 4	
A Cost Minimization Model for a Multi-Component Product Closed Loop Supply Chain Considering Big Data Dimensions Carla Natalia Isabel DEL ROSARIO, Dennis CRUZ, Pamela Nichole CHUATECO, Ysabel Dominique REYES	1169
Sensor Data Prediction in Process Industry by Capturing Mixed Length of Time Dependencies Wen SONG, Shigeru FUJIMURA	1174
QCM-01 Quality Control and Management 1	
Effectiveness of the Tactics for Small and Medium-sized Toy Factories in China in Dealing with European and US Toy Safety Requirements Shu Lun MAK, Chi Ho LI, C. W. KWONG	1179
A Study on Recycling the Plastic Wastes with Bamboo on Making Wall Tiles Shu Lun MAK, Fanny TANG, Chi Ho LI, Ming Yan WU, Tsz Wing CHAN	1184
Costs of Quality Management in Global and South African Manufacturing Companies: Similarities and Differences Bheki MAKHANYA, Jan Harm PRETORIUS, Hannelie NEL	1189
PPC-01 Production Planning and Control 1	
Strategic Sourcing – Selection of Suppliers Using DELPHI-AHP Approach Amit Kumar GUPTA, Narain GUPTA	1194
Resource Allocation in Decentralized, Self-organized, Multi-agent Industrial Systems Using Deep Deterministic Policy Gradient Yevheniya VYTRUCHENKO, Corbinian NENTWICH, Markus SAUER, Jochen NICKLES	1198
Dual-objective Job Shop Scheduling Problem with Skilled Workers Chantha SEM, Ronnachai SIROVETNUKUL	1203

QCM-02 Quality Control and Management 2

A Model to Assess the Impacts of ISO Management Systems Standards <i>Mónica CABECINHAS, Martí CASADESÚS, Paulo SAMPAIO</i>	1208
Multiscale Quality: Micro, Meso and Macro Concepts Catarina CUBO, Paulo SAMPAIO, Pedro SARAIVA	1216
Quality Prediction Method by Modeling the Sustained Effects of Irregular Process Disturbances Qi XIU, Michiko TANAKA, Masayuki SAKATA	1220
Overall Performance Comparison of Homogeneously Weighted Moving Average and Double Homogeneously Weighted Moving Average Schemes Zhi Lin CHONG, Junjie WANG, Jean-Claude MALELA-MAJIKA, Kok Ming CHAN, Sandile C. SHONGWE	1225
EBEC-02 E-Business and E-Commerce 2	
The Value of Commitment: Should Weaker Retailer Follow the Price of Dominate Rival? Hou-ping TIAN, Qiu-yu TAN, Meng-jiao YAO, Chang-xian LIU	1230
The Effect of Consumer Traits on Their Intention to Use Luxury Virtual-Reality (VR) Products: The Mediating Role of Status Signaling *Reza MOVARREI, Mona MASOUMZADEH*	1235
An Explorative Study on the Impact of Antecedent Mood States on Consumers' Evaluation of Hotels Online Sanchit PAWAR, Asle FAGERSTRØM, Gesaneephorn SUAPHUK, Niklas ERIKSSON	1240
Measuring Smart Cities: Identification of Smart Society Indicators in Indonesia Dwitika PANGESTUTI	1245
QCM-03 Quality Control and Management 3	
Evaluation of World Class Operations Perspectives in Postal Organizations Thabiso MOKOENA	1250
Methodology for a Model-based Traceability of Requirements from Complaints in Business Networks Using e-DeCoDe Marian MISTLER, Nadine SCHLUETER, Manuel LOEWER, Vincenz RAFALCZYK	1255
Knowledge Management Embedded in Agile Methodology for Quality 4.0 Monica LEBA, Andreea IONICA, Raluca DOVLEAC	1260
A Hierarchical Graphical Model of Critical Success Factors for Implementing the UAE's Government Excellence Ola Khalid ALZAWATI, Hamdi BASHIR, Imad ALSYOUF	1265
HF-01 Human Factors 1	
Factors Affecting the Well-being of People Working in Known Smart Cities: UTAUT2 Approach Yogi Tri PRASETYO, Mark Anthony SANTIAGO	1270

Cognitive Biases as Clues to Skill Acquisition in Manufacturing Industry Jun NAKAMURA, Nozomi KOMIYA, Sanetake NAGAYOSHI	1275
Structural Framework of Ambidextrous Leadership Behavior Affecting Firm's Innovation Vinay SINGH, Nikita SINGH, Shraddha BHADAURIA	1279
Kansei-based Mining and Robust Design for Internet Service Provider Markus HARTONO, Amelia SANTOSO, Dina Natalia PRAYOGO, Aisyah SALSABILA	1284
The Effects of Employee Volunteering on Organizational Loyalty: The Moderating Effects of Perceived Organization Support Zhenbin DING, Hongling YANG, Jianquan WANG, Jie XU	1289
CM Crisis Management	
Leadership for Team Adaptation and Performance During COVID-19 Crisis and Beyond: An Examination of Leader-member Exchange and Leader Humility *Kanupriya SINGH*	1294
Vehicle Interdiction Strategy in Complex Road Networks - A Simulation Based Approach Goutam SEN, Sukanya SAMANTA, Soumya K. GHOSH	1299
Concept for Enhancing the Contribution of Product Development to Organizational Resilience of Manufacturing Companies Jonas TITTEL, Michael RIESENER, Maximilian KUHN, Günther SCHUH	1303
HF-02 Human Factors 2	
Situational Awareness and Flight Approach Phase Event Recognition Based on Psychophysiological Measurements <i>Qinbiao LI, Cho Yin YIU, Simon C. M. YU, Kam K.H. NG</i>	1308
Robo Toons: Testing the Use of Animation Principles in Non-anthropomorphic Robots to Improve Human-robot Interaction Bernhard SCHMITT, Andrew PRAHL, Ann Li HO	1313
The Influence of Illegitimate Tasks on the Intention to Continue Volunteering: A Moderated Mediation Model Zhenbin DING, Hongling YANG, Jianquan WANG, Jie XU	1318
Exploring the Affective Way Leading to Impulse Buying in Social Media Live Streaming Li-Ting HUANG	1323
IS-01 Intelligent Systems 1	
Twenty Years of Configuration Knowledge Modeling Research. Main Works, What To Do Next? Michel ALDANONDO, Elise VAREILLES, Maryam MOHAMMAD AMINI, Thierry COUDERT	1328
Developing Integrated Configurators: A Longitudinal Case Study Linda ZHANG, Sara SHAFIEE	1333
Untrimmed Operator Standard Cleaning Action Parsing Based on Deep Learning Method Wei-Ling PAN Shuo-Yan CHOU	1338

System Readiness Level Model of Highway Intelligent Transportation System by Integrating a Value Engineering Process Ling WANG	1343
Low-entry Barrier Multi-agent System for Small- and Middle-sized Enterprises in the Sector of Automated Production Systems Fabian HABEN, Birgit VOGEL-HEUSER, Hicham NAJJARI, Matthias SEITZ, Emanuel TRUNZER, Luis Alberto CRUZ SALAZAR	1351
HF-03 Human Factors 3	
Why do Fans Participate in Environmental Public Welfare? A Study on the Participation Driving Forces Based on Value Co-creation Jie ZHANG, Yali ZHANG, Liaoliao LI	1358
Carbon Black Based Resistive Strain Gauge Sensor for Penile Measurement KwonHong LEE, JinHyoung KIM, Cheolung CHA, Hyungmin LEE	1363
Evaluation of Sense of Self-agency and Self-ownership During Mouse Operation Using Gaze and EEG Koki SHIMIZU, Syohei ISHIZU, Takashi ITO	1367
Requirements for an Assistance System to Support Human Resource Development in Manual Assembly Maria MAIER, Susanne VERNIM	1372
Quantifying the Economic and Ergonomic Potential of Simulated HRC Systems in the Focus of Demographic Change and Skilled Labor Shortage Tobias RUSCH, Michael SPITZHIRN, Sumona SEN, Titanilla KOMENDA	1377
IS-02 Intelligent Systems 2	
Model Transformation for Automatic Design of GPON/FTTH Network Kin POON, Anis OUALI, Ling CEN, Ming LIU	1382
Blockchain Application in Halal Supply Chain: Literature Review and Future Research Iwan VANANY, Dwi IRYANING HANDAYANI	1387
COVID-19 Detection Through Smartphone-recorded Coughs Using Artificial Intelligence: An Analysis of Applicability for Pre-screening COVID-19 Patients in Vietnam Dinh Son NGUYEN, Khoa TRAN DANG	1392
A Hybrid Approach with Joint Use of Tag and Rating for Vehicle and Cargo Matching Jiuwu ZHONG, Zhaojun YANG, Jun SUN	1397
Understanding Human-machine Collaborative Systems in Industrial Decision-making Kajal BHANDARI, Yan XIN, Ville OJANEN	1402

HF-04 Human Factors 4

Production Management in Norwegian Manufacturing Industry: The Implications of "The Norwegian Work 1407 Life Model"

 ${\it Emrah\ ARICA,\ Carl\ Christian\ R@STAD,\ Bjørnar\ HENRIKSEN,\ Einar\ HAREIDE,\ Thale\ KVERNBERG\ ANDERSEN}$

Assessment of Environmental Noise Annoyance: A Case Study of Industrial Noise in Thailand Pasit TINNAM, Nantakrit YODPIJIT, Suparoek JUNSUPASEN, Manutchanok JONGPRASITHPORN	1412
Remote Usability Testing Evaluation on the Most Visited E-commerce Website in Indonesia During Covid- 19 Pandemic Rida ZURAIDA, Fauzan FIRJATULLAH, Julian Tri HARYOKO	1417
TIKETAP: Designing a Smartphone App for Traffic Violation Tickets Through Design Thinking Process Eula Margareth JABILLES, Rosemary SEVA, Mark Anthony BALDOZ	1422
EBEC-01 E-Business and E-Commerce 1	
Transboundary Cooperation of Environmental Public Welfare Organizations: An Impact Mechanism Model Xingfang ZHAO, Yali ZHANG, Jun SUN	1427
A Multi-stage Framework for Complex Task Decomposition in Knowledge-intensive Crowdsourcing Shixin XIE, Xu WANG, Biyu YANG, Mei LONG, Jiyu ZHANG, Lei WANG	1432
Econometric Models to Estimate the Impact of Social Media Platforms On E-commerce: Pre- and Post-COVID Christina TAY	1437
Designing a Deceptive Comment Detection Platform with a Rule-based Artificial Intelligent Architecture Hongrui LIU, Arman TOPLU	1442
The Value of Information: Game Model of Supply Chain Based on C2M Hou-ping TIAN, Meng-jiao YAO , Qiu-yu TAN, Chang-xian LIU	1446
IPE Information Processing and Engineering	
A Logical Database Design Methodology for MongoDB NoSQL Databases Wai Yin MOK	1451
Stylized Dialogue Generation Shih-Wen KE, Wei-Liang CHEN	1456
A Conceptual Framework of Service Applications Based on Identity Resolution for Home Appliance Industry Ruirui WANG, Ziding MENG, Yuguang BAO, Xinguo MING	1461
Research on Dynamic Pricing of Shared Electric Vehicles Based on System Utility Maximization Rui MIAO, Lewen BAO, Bo ZHANG, Hao HU, Jiying ZHOU	1466
EET Engineering Education and Training	
Evaluating Undergraduate Students' Feedback Towards Service Quality of Private University: A Structural Equation Modeling Approach Yogi Tri PRASETYO, Lauren REGONDOLA-BOLATA	1471
Engineering Students' Experiences of Digital Remote Learning During COVID-19 Pandemic in OUAS Ville ISOHERRANEN, Jouni KÄÄRIÄINEN	1476

Technology-mediated Learning in Industry: Solution Space, Implementation, Evaluation Elisa ROTH, Mirco MOENCKS	1480
Socio-technical Qualification Modules for the Empowerment of Logistics Employees in the Technological Transition Markus KOHL, Johannes FOTTNER, Jens LOPITZSCH, Steffi ZIERHUT, Susanne WILPERS	1485
RME-01 Reliability and Maintenance Engineering 1	
Achieving Business Strategic Objectives: The Place of Maintenance Department Edoghogho OGBEIFUN, Patrick PASIPATORWA, Jan Harm PRETORIUS	1491
Maintenance Strategy Optimization of a Thermal Power Plant Arnesh TELUKDARIE, Tshegofatso MODIBA	1497
Belief Reliability Analysis of Traffic Network: An Uncertain Percolation CML Model Xiao CHEN, LinHan GUO, Yi YANG, Si Yu HUANG, WenShu XIE, Wei LIU	1503
The Use of TPM Principles to Measure System Performance Magano MOLEFE, Anup PRADHAN	1508
SSRM Safety, Security and Risk Management	
Prioritizing Project Interdependent Risks: A Network-based Approach Li GUAN, Alireza ABBASI, Michael RYAN	1513
Task-oriented VR Safety Training in Construction Falls Ying-Mei CHENG, Hsin-Yu LIAO	1518
A Systematic Literature Review on Industrial Fire and Explosion Accidents in the Petrochemical Industry Bheki MAKHANYA, Hannelie NEL, Sibusiso Desmond DUMA	1526
On the Necessity of Assessing Noise Pollution Intensity to Investigate Environmental and Societal Impact Ruwan WEERASINGHE, R.M. Chandima RATNAYAKE, Dunstan JAYARATHNE	1531
Risk-averse Hazmat Network Design Considering Endogenous Risk and Uncertainty Pengcheng DONG, Guodong YU	1536
A Cognitive-based Approach to Construction Safety Management Zhe HU, Weng Tat CHAN, Hao HU, Feng XU, Wen WANG	1541
RME-02 Reliability and Maintenance Engineering 2	
A Method of Vulnerability Assessment Based on Deep Learning and OSS Fault Big Data Yoshinobu TAMURA, Hironobu SONE, Adarsh ANAND, Shigeru YAMADA	1546
Performance Evaluation of IoT-enabled Predictive Maintenance Tatsuya INABA	1551
A Classified Situations Oriented Adaptive Scheduling Method of Robot-aided Aeroengine Faults Detection Jiawei REN, Xinyi SONG, Fei TAO, Ying CHENG	1556

EECA Engineering Economy and Cost Analysis

Improving Competitiveness Through the Application of Cost Estimation Models in the South African Automotive Industry Prianca NAICKER, Oludolapo OLANREWAJU	1561
Techno-economic Evaluation of a Second-life Battery Energy Storage System Enabling Peak Shaving and PV Integration in a Ceramic Manufacturing Plant Luca SILVESTRI, Gino BELLA, Michele DE SANTIS	1566
Cost Analysis of Collaboration Interfaces in an Interdisciplinary Engineering Workflow: A Model Based Approach Using BPMN+I Tim Konstantin HERRMANN, Minjie ZOU, Birgit VOGEL-HEUSER	1571
Evaluation of Human-robot Order Picking Systems Considering the Evolution of Object Detection Mathias RIEDER, Marco BONINI, Augusto URRU, Richard VERBEET, Norbert BARTNECK, Wolfgang ECHELMEYER	1576
Autonomous Deep-sea Shipping – The Economist's View Roar ADLAND, Siri P. STRANDENES	1584
RME-03 Reliability and Maintenance Engineering 3	
Safety Evaluation of the Time-variant Structure Under Epistemic Uncertainty Chunyan LING, Jingzhe LEI	1588
Condition Based Maintenance Policy for Crankcase Lubricating Oil in Diesel Locomotives Monika TANWAR, Nagarajan RAGHAWAN, Sidra KHANAM	1593
Poster 01	
A Comprehensive Investigation of Knowledge Management Publications Rodrigo OLIVEIRA DE CASTRO, Cesar SANIN, Andrew LEVULA, Edward SZCZERBICKI	1599
Exploring the Hotspots and Trends of the Literature on R&D Networks: Bibliometric and Content Analysis <i>Yan WANG, Naiding YANG, Yu WANG, Min GUO</i>	1606
Planning of Teaching Contents of Industry-oriented Capstone Course in Technological Colleges and Universities Feng-Ming SUI, Jen-Chia CHANG, Hsi-Chi HSIAO	1612
Crowdsourced Manufacturing for Delivery of Manufacturing as a Service Roger JIAO, Xuejian GONG, Amit JARIWALA, Beshoy MORKOS	1617
Application for Roof Type Analysis and Component Counting from Roof Plan Image Thanawinn ARPHACHARAS, Nagul COOHAROJANANONE, Pravee KRUACHOTTIKUL, Peelak WANTANASIRI, Dhanawat MAHASIRIWATTANAKIJ	1622
A Study of Applying Unsupervised Learning Methods for Document Clustering and Automatic Categorization of Software Chin-Yu HUANG, Kai-Wen CHEN	1626

Exact Algorithms for Robust Quay Crane Scheduling Problems Yitian LI, Canrong ZHANG	1631
Sustainability Evaluation of Tobacco Excise Tax Policy to Finance Universal Health Coverage in Indonesia Teuku Naraski ZAHARI, Komarudin , Akhmad HIDAYATNO	1636
Creative Activity Outcomes and Optimal Task Scheduling Sanetake NAGAYOSHI, Jun NAKAMURA	1641
Poster 02	
Review on the Application of Eye-tracking Technology in Usability Evaluation of E-government Apps Jingyi ZHANG, Danni CHANG, Zhen ZHANG	1646
Eye Tracking-based Usability Evaluation of E-government App Icon Design Zhen ZHANG, Danni CHANG, Jingyi ZHANG, Renbo DING	1651
Research on Omni-channel Supply Chain Pricing Decision with the Allowance of Cross-channel Return Shujun YANG, Huajun TANG	1656
A Heuristic-IRM Method on Hard Disk Failure Prediction in Out-of-distribution Environments Jichao WANG, Ran ZHANG, Lanqing HONG, Guanqiang QI	1661
Poster 03	
Advance Selling Strategy for Risk-averse Strategic Customers Xiaowen SUN, Limin SUN	1665
From Smart Card to Mobility as A Service (MaaS): A Case Study from Kaohsiung City, Taiwan Keng-Chieh YANG, Wen-Ping CHAO	1671
How Effective Vertical Organizational Communication Impacts the Success of Hoshin Kanri Strategy Implementation in Medium-sized Manufacturers Samuel Brüning LARSEN, Torben KNUDBY, Rasmus SORTH-OLSEN	1676
Product Group Technology Under Multiple Process Paths Based on Genetic Algorithm Xuerong LUO, Bo LI, Tao HONG, MInmin LIU	1681
Cyber-physical System-based Workshop Tongtong ZHOU, Zhihua CHEN, Xinguo MING, Yuan CHANG	1686
Research on the Lean Logistics System Framework of Tobacco Commercial Enterprises in the Context of Digital Empowerment Jiangtao XIA, Yong ZHAO, Caihong LIU	1691
A Fast Approximate Method for the Large-scale One-source P-median Problem Runze ZHAO, YiYong XIAO, Rui LUO, Yue ZHANG, Xiaoyuan LIU	1696
Poster 04	
Health Assessment Method of Integrated Navigation System Based on Operation Data Jingyue YANG, Wei LIU, Zhichao PANG	1701

Evaluation of Home Care vs. Conventional Care Using Parametric Cost Estimation and the Fuzzy Analytical Hierarchy Process: A Case Study in Central Sweden Annika HASSELBLAD, Leif OLSSON, Jonas SANDSTROM	1706
Scheduling Method of Mixed-flow Assembly Line Based on Complete Kit of Materials Yang CAO, Bo LI, Tao HONG, MInmin LIU	1711
Design and Development of a Digital Twin Dashboards System Under Cyber-physical Digital Twin Environment Weidong LIN, Malcolm Yoke Hean LOW	1716
Analysis of Housing Prices of Urban with Port and City Integration Taking Kaohsiung Example Kuei-Chen CHIU	1721

Author Index