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PROGRAM BOOK 13th ISIEM 2021

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[Production and Service System in The New Normal Era]

Bandung, West Java, Indonesia

July 28, 2021

ISIEM

Organized by:
INDUSTRIAL ENGINEERING DEPT.

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PREFACE

Bismillahirrahmanirrahim,
Assalamu'alaikum Warrahmatullah Wabarrakatuh,

First of all, we apologize for the inconvience in the 13th ISIEM 2021 event, due to current condition and situation of COVID 19. The situation made us has to make some critical modification in the event, including: online presentation of keynote speaker, online presentation for all candidates that cannot attend the seminar. but we hope we all remain excited to continue to contribute to research publications. Nonetheless, we are trying to prepare this seminar as best we can.

This issue is published in line with the Thirteen International Seminar on Industrial Engineering and Management (13th ISIEM) 2021. The articles cover a broad spectrum of topics in Industrial Engineering and Management, which are Quality Engineering Management, Decision Support System and Artificial Intelligent, Ergonomics, Supply Chain Management, Production System, Operation Research, and Industrial Management. These articles provide an overview of critical research issues reflecting on past achievements and future challenges. Those papers were selected from 137 abstracts, and we send these papers to AIP to be published there as an Open Access Proceeding Scopus. This statistic shows the high competition to get published on this proceeding. This issue and seminar become special as more delegates come and join from various country as well as universities. We host 90 delegates both from abroad and local.

The 13th ISIEM is hosted by eight universities, which are Universitas Pasundan, Universitas Esa Unggul, Universitas Trisakti, Universitas Tarumanagara, Universitas Al-Azhar Indonesia, Atma Jaya Catholic University of Indonesia, Universitas Pancasila and Universitas Mercubuana. This is the thirteenth years of the collaboration of those universities, and the first time we had MOU with AIP in America to publishing the papers that is indexed by Scopus. This is also the second years of our international partnership join committee with Chung Yuan Christian University – Taiwan, Yuan Ze University – Taiwan, Kasetsart University – Thailand and Bright Star University – Libya.

In this occasion, let us give special thanks to Prof.Yung-Tsan Jou, PhD (Professor and Chair Department of Industrial and Systems Engineering, Chung Yuan Christian University – Taiwan), Prof. Yun-Chia Liang, PhD (Professor and Chair, Department of Industrial Engineering and Management, Yuan Ze University – Taiwan), Elisa Lumbantoruan (President Director & CEO at ISS Indonesia, Independent Commissioner at PT Indosat Tbk, and Independent Commissioner at Garuda Indonesia) and Naraphorn Paoprasert, Ph.D (Researcher, Department of Industrial Engineering, Faculty of Engineering, Kasetsart University – Thailand), for their contribution as keynote speakers, to Prof. Abdelnaser Omran from Brightstar University, and supported by Indonesian Association of Industrial Engineering Higher Education (BKSTI) and the Institution of Engineer Indonesia – Industrial Engineering Chapter (BKTI-PII). We are also grateful to all reviewers and editors, for their commitment, effort and dedication in undertaking the task of reviewing all of the abstracts and full papers. Without their help and dedication, it would not be possible to produce this proceeding in such a short time frame. I highly appreciate all members of committees (advisory, steering, and organizing committees) for mutual efforts and invaluable contribution for the success of seminar.

Wassalamu'alaikum Warrahmatullah Wabarrakatuh.

Dr. Winnie Septiani, ST, MSi, CIQaR
Chairman

The Conference Program

0830
Zoom Meeting Open,
Welcoming, Informations,
by the Committee

0900
Welcoming Remarks,
Code of Silence, National Anthem
by MC: Dr. Ir. Yogi Yogaswara,MT.

0915
Greeting Speech by Chairman
Dr. Winnie Septiani, ST, MSi, CIQaR

0920
Opening Speech by
Prof. Dr. Ir. H. Eddy Jusuf, SP. MSi., MKom.
Rector of Universitas Pasundan

0925
Partnership Ceremony by
Representation of University Committee
and Partner University

The Keynote Session

Modertator,
Riana Magdalena, SSi., MBA.

0930
Prof. Yung-Tsan Jou, Ph.D.,
Chung Yuan Christian University
Taiwan

1000
Naraphorn Paoprasert, Ph.D
Kasetsart University
Thailand

1030
Prof. Yun-Chia Liang, Ph.D.
Yuan Ze University
Taiwan

1100
Elisa Lumbantoruan,
Independent Commissioner
at Garuda Indonesia

Question and Answer 1130 – 1200

Lunch Break 1200 – 1300

PARALLEL SESSION 1300 – 1700

*All time in WIB (Western Indonesian Zone - GMT+7)

Join the 13th ISIEM Seminar Guideline

Dress appropriately. This is an international event with huge number of participants coming from many countries.

Please be aware of your surroundings. Adjust your work setup so that you face a window or are exposed to plenty of light, and make sure you use the virtual background given by the committee. It is recommended to put on the earpiece or headset equipped with microphone.

Leave the keyboard alone. It will prevent you from devoting your full attention to the meeting

Check your connection. Make sure your network adapter, Wi-Fi or internet connection is in a working condition to avoid zoom meeting problems during the plenary and parallel sessions

Mute the microphone. The honorable speakers will deliver great speeches. So please mute your microphone when you are not speaking to give other participants the ability to chime in and share their thoughts without any distraction

The participant may turn off the webcam. During your presentation and or make a question, it is compulsory to turn on the webcam

Stay seated and stay present. This conference will take around 8 hours of your day. It may be tempting to do other things during the meeting, but please refrain in doing so. Because you might miss out on key information or an opportunity to give input.

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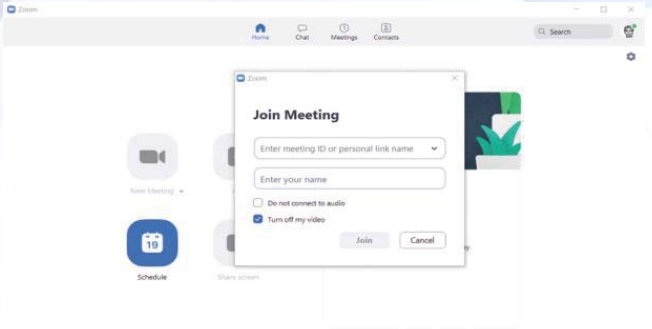

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Remember to mute the microphone and webcam on for necessary speak. When you have a question, click on [Reactions] icon and choose [Raise Hand] icon and wait until the moderator let you to speak.

The morning session is a Keynote Speeches session. During this session there will be no breakout room in Zoom platform.
The noon session is a parallel session. Breakout room will be applied.
The Author may enter the room as shown on the schedule of parallel session in the Program Book by click on [Breakout Rooms], then choose the room that you will make a presentation

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KEYNOTE SPEAKERS

Prof. Yung-Tsan Jou, Ph.D., received his Ph.D. degree in Integrated (ME, ISE) engineering from Ohio University, Athens, OH, in 2003. He is the Chair and Associate Professor of Industrial and Systems Engineering at Chung Yuan Christian University, Taiwan. His research has made contributions in green design, human–system interface design, senior assistive devices, and usability or quality evaluation by using virtual reality tools, smart manufacturing, machine learning, and data analysis.

Naraphorn Paoprasert, Ph.D., is an associated professor at the Department of Industrial Engineering, Kasetsart University, Thailand. She received her Ph.D. from the Department of Industrial Engineering, University of Wisconsin-Madison, USA. Currently, she is a director of the International Graduate Program under the Department of Industrial Engineering. Her past research studies have been focusing on decision analysis and game theory, risk analysis, system simulation, process improvement, and economics analysis. The first research exposures were focusing on decision making to protect the system against natural disasters and terrorism. Later on, the focuses were on decision making in various fields such as agriculture, research fund allocation, education, etc.

Prof. Yun-Chia Liang, Ph.D., received his Ph.D. form Industrial and Systems Engineering, Auburn University – Alabama USA. He actives as Professor and Chair, Department of Industrial Engineering and Management, Yuan Ze University – Taiwan, Vice Director, the Smart Production and Innovation Management Research Center (SPIM), Yuan Ze University, Associate Editor, Journal of Industrial and Production Engineering (JIPE), Planning Committee, IEM Division, Ministry of Science and Technology (MOST), Taiwan, and many more academic activities.

Elisa Lumbantoruan, received Bachelor degree in Institut Teknologi Bandung on Mathematics. He has skill in Business Strategy, Strategic Planning, Business Planning, Business Development, Business Analysis, Risk Management, Management Telecommunications, Business Intelligence, Negotiation.
He experiences in many enterprises and until now is the President Director & CEO at ISS Indonesia, Independent Commissioner at PT Indosat Tbk, and Independent Commissioner at Garuda Indonesia

GLOSSARY

QM = Quality Management
SCM = Supply Chain Management
IECS = Industrial Engineering, Computer Science
EPD = Ergonomic, Product Design
PS = Production System
DAIS = Decision Analysis and Information System
OR = Operation Research
IS = Industrial System

Table of Contents

1. 13th-ISIEM-Paper 002 – QM 34
   Reducing Defect Products in Instant Noodles Production with Six Sigma
2. 13th-ISIEM-Paper 006 – IECS 34
   Structural Health Monitoring for Intelligence Structure: Damage Feature
3. 13th-ISIEM-Paper 007 – PS 34
   Inventory Level Improvement with a Forecasting Methods in the Taxi Transportation Industry
4. 13th-ISIEM-Paper 008 – SCM 35
   Bibliometric Mapping Of Biomass For Energy Supply Chain Model: Review and Future Research agenda
5. 13th-ISIEM-Paper 009 – EPD 35
   Finding a Research Gap on Service Quality and Safety Improvement in Public Transportation
6. 13th-ISIEM-Paper 010 – DAIS 35
   Decision Support System for Raw Material Supplier Selection by Using Fuzzy AHP-TOPSIS Method in PT Mulia Glass
7. 13th-ISIEM-Paper 011 – SCM 36
   Methods and Approaches Mapping for Supplier Selection: Literature Review
8. 13th-ISIEM-Paper 012 – EPD 36
   Redesign Plastic Waste Processing Machine by Using the Lean Product Development Method
9. 13th-ISIEM-Paper 013 – EPD 37
   Risk Analysis and Safety Improvement of Plastic Waste Processing Machine
10. 13th-ISIEM-Paper 014 – DAIS 37
    YBM University Tourism Building Location Selection With A Combination of Cut Off Point And AHP Topsis Method
11. 13th-ISIEM-Paper 015 – DAIS 37
    Evaluation of E- Learning Implementation Using Student Readiness Instrument
12. 13th-ISIEM-Paper 016 – IS 38
    Exploring Customer Sentiment Regarding Indonesian Online Transportation Services: Evidence from Twitter Social Media
13. 13th-ISIEM-Paper 017 – DAIS 38
    The Blue Print of Intelligent Decision Support System for Supply Chain Kenaf Agroindustry
14. 13th-ISIEM-Paper 018 – IECS 38
    Simulation Modelling of a Train Station Ticketing System: A Case Study of Zhongli Train Station in Taiwan
15. 13th-ISIEM-Paper 019 – IECS 39
    Design and Evaluation of LoRa-based Mesh Network for Water Metering Infrastructure
16. 13th-ISIEM-Paper 020 – IS 39
    A Maturity Model of I4.0 in Developing Country: Challenges and Enablers in Indonesia for Using INDI 4.0 as A Measuring Instrument of I4.0 Readiness
17. 13th-ISIEM-Paper 021 – DAIS 40
    Resilient and Sustainable Supplier Selection: Trends in Criteria and Methods
18. 13th-ISIEM-Paper 022 – OR 40
    Parameter Tuning for Combinatorial Bees Algorithm in Travelling Salesman Problems
19. 13th-ISIEM-Paper 023 – SCM 40
    Research Opportunities on Energy Supply Chain Management
20. 13th-ISIEM-Paper 024 – QM 41
    Analysis of Big Losses to Increase Productivity with SMED Method in Hand Sanitizer Products
21. 13th-ISIEM-Paper 025 – IS 41
    Analysis of Optimistic Bias and Pessimistic Bias in Preparation for The New Normal
22. 13th-ISIEM-Paper 026 – EPD 41
    Analysis of Work System to Productivity with Work Stress as Moderating Variable

23. 13th-ISIEM-Paper 028 – DAIS 42
Design of Sales Information System Based on Website at Amonyu Shop
24. 13th-ISIEM-Paper 029 – DAIS 42
Decision-Making for Conducting Seismic-Surveying Activities on Oil and Gas Exploration Using Decision Tree and Utility Functions
25. 13th-ISIEM-Paper 030 – OR 42
Dynamic Programming for Shortest Path Problem in a Multi-modal Transportation Network Comprising Intermediate Sinks
26. 13th-ISIEM-Paper 031 – SCM 43
Hybrid Simulation of Supply Chain : A Review
27. 13th-ISIEM-Paper 032 – DAIS 43
A Conceptual Framework for An Adaptive Sustainability Assessment for Industry and Further Research Potential
28. 13th-ISIEM-Paper 033 – QM 44
Improve The Quality of Korean Garlic Cheese Bread Using The Six Sigma Method
29. 13th-ISIEM-Paper 034 – SCM 44
Analyzing the Gap in Supply Chain Business Process of National Engineering Procurement Construction (EPC) Company Using Rapid Assessment Procedure
30. 13th-ISIEM-Paper 035 – SCM 44
Impact of Supply Chain Practices on Customers' Retention
31. 13th-ISIEM-Paper 036 – OR 45
Application of Fourier Grey Model (FGM) For Demand Forecasting and Markov Chain Method for Inventory Planning
32. 13th-ISIEM-Paper 037 – EPD 45
Usability Evaluation And Improvement Design Of Hospital Mobile Website
33. 13th-ISIEM-Paper 038 – IS 45
Waste Reduction Strategy Design Based on Risk Assessment and Cost Benefit Approach
34. 13th-ISIEM-Paper 040 – DAIS 46
E-Commerce Application of Oil Palm Fresh Fruit Bunches Supply Chain
35. 13th-ISIEM-Paper 041 – PS 46
Design Model Forecasting and Delivery Requirement Planning for Fast Food Product
36. 13th-ISIEM-Paper 042 – EPD 46
Comparative Analysis of Mental Workloads For Disruption Technicians And New Installation Technicians Using The NASA-TLX Method (Case Study: PT Telkom Akses Kandatel Sleman)
37. 13th-ISIEM-Paper 043 – DAIS 47
Warehouse Management Analysis with Value Stream Mapping and 5S to Improve Efficiency Process Productivity
38. 13th-ISIEM-Paper 044 – IS 47
Increasing Consumer Satisfaction and Loyalty with Product Innovation, E-Commerce and Reward Factors
39. 13th-ISIEM-Paper 045 – PS 48
The Smart Factory Model for Bogie Assembly Workshop in the Rolling Stock Industry
40. 13th-ISIEM-Paper 046 – DAIS 48
Implementation of Artificial Intelligence in Improving The Quality of Service System in Telecommunications Industry
41. 13th-ISIEM-Paper 048 – QM 48
Production Quality Improvement Through Six Sigma: A Crude Palm Oil Industry Case Application
42. 13th-ISIEM-Paper 049 – IS 49
Strategy Designed toward Performance Improvement of Asset Management System
43. 13th-ISIEM-Paper 050 – PS 49
Development of Operation Scheduling Systems at Workstations with the Autonomous Distributed Manufacturing Systems (ADiMS) Concept

Session 2 (15.00 – 17.00)				
Track : Industrial System (IS)				
Session ID:		S2.5		
Session Chair:		Dr. Dino Rimantho, ST., MT		
Session Parallel:		Nur Yulianti Hidayah, ST., MT		
Paper ID	Time	Name	Title	University
19	15.00 - 15.10	Rifki Muhendra, Naufal Ismail Kreshnaviyanto, Aisyah Amin, Paduloh, Solihin and Achmad Muhazir	Design and Evaluation of LoRa-based Mesh Network for Water Metering Infrastructure	Universitas Bayangkara Jakarta, ITB
18	15.10 - 15.20	Rizky Muftygendhis, Wei-Jung Shiang, Yung-Tsan Jou, Ya-Hsien Lin, Rohmat and Jun Sato	Simulation modelling of a train station ticketing system: a case study of Zhongli station in Taiwan	Chung Yuan Christian University - Taiwan
32	15.20 - 15.30	Muhammad Asrol, Haris Purna Widyatama and AAN Perwira Redi	A Conceptual Framework for An Adaptive Sustainability Assessment for Industry and Further Research Potential	Bina Nusantara University
38	15.30 - 15.40	Winda Nur Cahyo, Bayu Agung Swasono, Riza Said Isyak Raben, Riyan Tri Sutartono, Haryo Prawahandaru and Taufiq Immawan	Waste Reduction Strategy Design Based on Risk Assessment and Cost Benefit Approach	Universitas Islam Indonesia
	15.40 - 16.00	Q & A		
25	16.00 - 16.10	Atyanti Dyah Prabaswari and Bagus Wahyu Utomo	Analysis of Optimistic Bias and Pessimistic Bias in Preparation for The New Normal	Universitas Islam Indonesia, Sekolah Tinggi Teknologi Adisutjipto
66	16.10 - 16.20	Amalia Yuli Astuti, Riri Dwi Adzaningtyas and Nurul Akbar	Clustering the Micro, Small and Medium Enterprises (MSMEs) in Yogyakarta City based on Technology Readiness Index 2.0 using K-Means Method	Universitas Ahmad Dahlan
49	16.20 - 16.30	Winda Nur Cahyo, Nael Naufal Fiantama and Haris Hadiyanto	Strategy Designed toward Performance Improvement of Asset Management System	Universitas Islam Indonesia
29	16.30 - 16.40	Heni Hindayanti and Winnie Septiani	Decision-Making for Conducting Seismic-Surveying Activities on Oil and Gas Exploration Using Decision Tree and Utility Functions	Universitas Trisakti
	16.40 - 17.00	Q & A		

developed to open or close counters automatically based on the customer waiting numbers were evaluated by simulation methods. The output of customer waiting time was analyzed with statistical tests to verify significant differences between the original and alternative models. According to the statistical results, an alternative model with three counters remaining open and open or close counter numbers based on pre-set customer waiting numbers has larger counter utilization rate and less required counters, and the average of customer waiting time is acceptable in the rush hour.
Keywords: simulation modelling, service improvement, simulation system, queuing simulation.

13th-ISIEM-Paper 019 – IECS

Design and Evaluation of LoRa-based Mesh Network for Water Metering Infrastructure

Rifki Muhendra [1,a)], Naufal Ismail Kreshnaviyanto [2)], Aisyah Amin [3)], Paduloh Paduloh [1,b)], Solihin Solihin [1)], and Achmad Muhazir[1)]

[1]Industrial Engineering, Bhayangkara Jakarta Raya University, Bekasi, Indonesia [2] Physics, Faculty of Mathematics and Natural Sciences, Institut Teknologi Bandung, Bandung, Indonesia, [3] Physics, Universitas Halim Sanusi, Bandung, Indonesia

Abstract. The demand for water meter monitoring has become urgent nowadays. For this reason, this research aims to develop a LoRa network for water meter infrastructure applications. We have designed a low-power measurement node using an 8-bit microprocessor and LoRa transceiver by connecting software for monitoring water consumption and remote data transmission. In this study, several schemes were made to measure Lora data transmission performance for point to point and mesh networks. The results showed that the LoRa value and the TX power and spread factor (SF) value, which was higher, could increase the data transmission range for point-to-point network schemes. SF 8 provides the most optimal data transmission performance in a mesh network scheme, both in direct transmission and multiple hops. The packet delivery rate is measured at 100%, with an average ping time of 582 ms for each hop. This design increases the time interval and reduces transmission failures in times of data congestion. Implementing a LoRa-based mesh network in residential areas automatically builds data transmission lines and connects with surrounding nodes to build a mesh network. Percentage of PDR measured for each node in the network above 97%.
Keywords: LoRa, Mesh, Packet delivery ratio, Spreading factor.

13th-ISIEM-Paper 020 – IS

A Maturity Model of I4.0 in Developing Country: Challenges and Enablers in Indonesia for Using INDI 4.0 as A Measuring Instrument of I4.0 Readiness

Hasbullah Hasbullah[1a], Salleh Ahmad Bareduan[2b], Sawarni Hasibuan[3c]

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Abstract. Industry 4.0 (I4.0) Readiness Index Indonesia (INDI 4.0) is an approach to measure readiness to adopt I4.0 in Indonesia as a basis to develop a roadmap and strategy towards I4.0. In Southeast Asia, Indonesia seemly left behind in the policy launch timeline of I4.0 initiatives as a national plan to improve competitiveness. Indonesia's rank is lower than Singapore, Thailand, Vietnam, and Malaysia. From the INDI 4.0 initial assessment in 2018, Indonesia got a low score at an average of 1.992 (scale 0 to 4). This paper aims to identify challenges and enablers by comprehensive review to enhance INDI I4.0 effectiveness, so contributing more accurate measuring I4.0 readiness and strategy for both government and industry of Indonesia. This research used a multi-methodological approach, exploring articles, a qualitative approach, and participating in group workshops. This study found no differences in the general approach and principle in INDI 4.0 and other primary indexes used in other countries. It is similar in defining a roadmap, the steps in developing the I4.0 index and dimensions, and determining technology as the basis of measurement. From this finding, this study identified challenges and enablers in implementing INDI 4.0.
Keywords: Industry 4.0, INDI 4.0, readiness index, challenges, enablers

risk assessment and cost benefit analysis is discussed. Each waste has a root cause that has the impact and potential of events that vary and affect the goal so that it can be called as a risk. This study aims to get a strategy to reduce waste in order to get an effective and efficient production activity. The research begins by identifying waste in value stream mapping, followed by risk assessment and identification of the root cause of waste. There are 10 potential wastes are found with the wet material is root cause of the highest risk: the production stoppage. The proposed strategy from this research is a proposed design for the warehouse and develop a new standard operation procedure for burning raw materials and make a form for recording the submission of change of load and flow of the submission process. The outcome of this proposed strategy potentially can reduce the cost of loss approximately Rp 39.067.221,38.
Keywords: Lean manufacturing, risk analysis, benefit cost analysis, asset management, waste, sugar factory

13th-ISIEM-Paper 040 – DAIS

E-Commerce Application of Oil Palm Fresh Fruit Bunches Supply Chain

Harison[1.1.a)], Marimin[2.2.b)], Sukardi[3.2.c)], Faqih Udin[4.2.d)] and Yani Nurhadryani[5.3.e)]
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Abstract. The use of smartphone technology for social activities has a good effect on e-commerce activities, and many Indonesians have taken advantage of this technology. With this opportunity, the authors designed an e-commerce application for buying and selling oil palm fresh fruit bunches used by independent smallholders, traders, factories, and transportation. This application is intended to use a unified modeling language and the programming language Javascript MySQLit database. This application can provide information on the availability of oil palm harvests advertised by farmers in this application. The application is also able to facilitate transactions, whether done by Cash Only Delivery or via transfer. This application is also enabled with the provider of selected or recommended palm fresh fruit bunches. There are recommendations for the availability of oil palm fresh fruit bunches by entering the value of needs for traders and mills. Then the system will display a map of the location points of the suppliers of oil palm fresh fruit bunches. Visual information on providers is also shown. The results of system testing have been able to carry out the design plan.
Keywords: E-commerce 1, Application 2, Fresh Fruit bunches 3, Palm oil 4.

13th-ISIEM-Paper 041 – PS

Design Model Forecasting and Delivery Requirement Planning for Fast Food Product

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Abstract. PT. IKI is a company engaged in the culinary field with its main product being fried chicken, has a problem in its logistics activities, the first problem is the overstock in the stock of its chicken products which causes large storage costs, and the second problem is scheduling the distribution of its products that are not orderly so as to cause the delivery process to be less effective. See the problems that have occured, this research was carried out to get the best forecasting model, then applied the Distribution Requirements Planning (DRP) method to distribute chicken products as optimally as possible. The research was conducted by doing forecasting by combining Multiple Neural Networks (MNN), Seasonal Naive Bayes (SNB), and ARIMA to obtain a forecasting model that is close to actual conditions in the field. The forecast results are used to determine Safety Stock, ROP, and lot sizing with FOQ for the distribution schedule with the DRP method. The results showed determination of forecasting by combining MNN, SNB, and ARIMA can balance the level of product inventory at the optimal amount and DRP method positively impacted a 25% reduction in distribution costs. Keywords: Logistic, MNN, SNB, ARIMA, DRP

13th-ISIEM-Paper 042 – EPD

Comparative Analysis of Mental Workloads For Disruption Technicians And New Installation Technicians Using The NASA-TLX Method (Case Study: PT Telkom Akses Kandatel Sleman)

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