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PROGRAM BOOK
13th ISIEM 2021

INTERNATIONAL SEMINAR ON INDUSTRIAL ENGINEERING AND MANAGEMENT

[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.
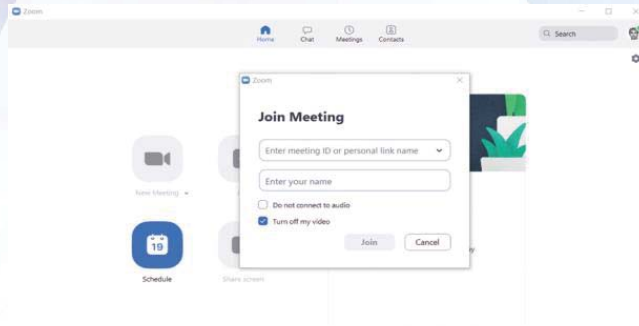
JOIN 13th ISIEM ZOOM MEETING

You can download Zoom at https://www.zoom.us/
Once the Zoom apps is being installed, you have to make a registration to have a Zoom account

To join Zoom meeting, you can click on the Zoom link we gave, or in Zoom apps click on [Join], type in the meeting ID (as shown in the Zoom invitation we gave), type in your name with this format: **session#_paper#_yourname. Example: S1.1_001_John Wick**, click [Join], then type in the passcode (as shown in the Zoom invitation we gave), and Zoom meeting will begin. Make sure you have a stable internet connection

If your PC/Laptop is able to put a background, please set your Zoom background to 13th ISIEM official background. You can download the background from this link:
https://drive.google.com/drive/folders/1ujOHaht9cvOKLXXNOvK7lsJAdWuzSpZZ?usp=sharing
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

ISIEM

13th INTERNATIONAL SEMINAR ON

INDUSTRIAL ENGINEERING AND MANAGEMENT

INDUSTRIAL ENGINEERING DEPARTMENT
Universitas Trisakti || Universitas Pancasila || Universitas Esa Unggul
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Chung Yuan Christian University || Yuan Ze University
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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
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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.

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.

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]

[1,3]Department of Industrial Engineering, Universitas Mercu Buana, Jl. Meruya Selatan No. 1 Kembangan, Jakarta Barat, Indonesia,

[2]Department of Manufacturing and Industrial Engineering, UTHM - University Tun Hussein Onn Malaysia, Batu Pahat, Johor Malaysia

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