

# Program Book



## Tarumanagara International Conference on the Applications of Technology and Engineering 2020

August 3<sup>rd</sup> - 4<sup>th</sup>, 2020



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## **Program Book**

# **TARUMANAGARA INTERNATIONAL CONFERENCE ON THE APPLICATIONS OF TECHNOLOGY AND ENGINEERING (TICATE 2020)**

**UNTAR  
JAKARTA – INDONESIA**

## WELCOME MESSAGE

### BY CHAIRMAN OF THE 3<sup>RD</sup> TICATE 2020

On behalf of the organizing committee of the 3<sup>rd</sup> TICATE 2020, I would like to welcome all delegates to attend this event online with great pleasure. In the concern of COVID-19 pandemic, this international conference is being held online from August 3-4, 2020 from Campus I- Jl. Letjen S. Parman No. 1, Jakarta. The 3<sup>rd</sup> TICATE 2020 is organized by Universitas Tarumanagara and technically sponsored by IOP Publisher.

The 3<sup>rd</sup> TICATE 2020 has attracted many academicians, scientists, engineers, postgraduates and other professionals from many countries. This conference accepted 220 papers from 6 different countries, those are Australia, Taiwan, India, Malaysia, Germany, and Indonesia. The aim of the conference is to promote exchange of ideas among engineers, researchers, and scientists active in the related areas of technology and engineering.

Our special thank goes to our Rector, Prof. Dr. Ir. Agustinus Purna Irawan, who has initiate this international conference, to our Plenary Speakers, Prof. Ir. Dr. Lee Sze Wei from Tunku Abdul Rahman University College, Malaysia, and Prof. Dr. Ir. Tresna P. Soemardi, S.E., M.S. from Universitas Indonesia, Indonesia, and Prof. Marco M. Polo, from De La Salle University-Dasmariñas, Philippine. We would like also to thank our partner international and national Universities in contributing and participating in this international conference.

To all individuals and organizations such as the members of international editorial board, the conference organizers, the reviewers and the authors, for their contribution in making the 3<sup>rd</sup> TICATE 2020 as a successful international conference and a memorable gathering event. I am also grateful for the support of publication service of IOP Publisher. We hope that the conference could present you wonderful memories to bring home in addition to new insights and friendship congregated during the event.

We truly value your participation and support for the conference. We hope that you will gather many experiences and benefits from this event.

**Dr. Hugeng, S.T., M.T. (SMIEEE)**

**CHAIRMAN OF THE 3<sup>RD</sup> TICATE 2020**

## **FOREWORDS**

**BY RECTOR OF UNIVERSITAS TARUMANAGARA**

Dear our Distinguished guests, ladies and gentlemen,

It is such a great pleasure for me to welcome all the participants to the Third Tarumanagara International Conference on the Applications of Technology and Engineering (TICATE) 2020. It is the 3<sup>rd</sup> international conference which is organized by Universitas Tarumanagara in the field of technology and engineering whose proceedings will be indexed by Scopus.

As we all know, the goal of this conference is to provide a forum that facilitates the exchange of knowledge and experience of both practitioners and academics in the fields of the applications of technology and engineering. Under these circumstances, they can mutually share their findings. Besides, the topic itself, which is about the Implementation of Research Results and Innovation for People's Prosperity, is extremely interesting. I can agree with the conference committee that a little thing has been done to provide comprehensive understanding of the importance of technology and engineering to support people's prosperity.

I would like to take this opportunity to extend my appreciation to the following institutions. Firstly, this year's conference becomes special due to the support from our Plenary Speakers, Prof. Ir. Dr. Lee Sze Wei from Tunku Abdul Rahman University College, Malaysia, and Prof. Dr. Ir. Tresna P. Soemardi, S.E., M.S. from Universitas Indonesia, Indonesia, and Prof. Marco M. Polo, from De La Salle University-Dasmariñas, Philippine. We are thankful for your wonderful cooperation.

I would also sincerely say thanks to the organizing committee for their commitment, hard work and dedication, making this internationally reputable conference successfully realizable.

Finally, I would like to express my gratitude for the presence of distinguished speakers, authors, reviewers, and a number of active participants from several countries. I wish you all a wonderful and great conference. Thank you.

**Prof. Dr. Ir. Agustinus Purna Irawan, Asean Eng.**  
**RECTOR OF UNIVERSITAS TARUMANAGARA**

## TIME AND VENUE OF INTERNATIONAL CONFERENCE

The International Conference will be held with following details:

Venue : Auditorium Building M, 8<sup>th</sup> Floor  
Universitas Tarumanagara  
Jalan Letjen S. Parman No. 1, Grogol,  
Jakarta Barat, Indonesia, 11440

Date : 3 – 4 August 2020

Time : 08.00 – 17.00 Jakarta Time

## 2. SPEAKER

### Keynote Speaker

**1. Prof. Ir. Dr. Lee Sze Wei**

President, Tunku Abdul Rahman University College, Malaysia

**2. Prof. Dr. Ir. Tresna P. Soemardi, S.E., M.S.**

Universitas Indonesia, Indonesia

**3. Prof. Marco M. Polo**

Director, University Advancement Office  
De La Salle University-Dasmariñas Philippines

### Invited Speaker

**1. Dr. Linda Lin Chin Lin**

Kun Shan University, Taiwan

**2. Dr. Eko Harry Susanto, M.Si**

Universitas Tarumanagara, Indonesia

### 3. COMPOSITION OF COMMITTEE

#### 1. Honorary Chair

Prof. Dr. Ir. Agustinus Purna Irawan, Asean Eng Rector Universitas Tarumanagara  
R.M. Gatot Soemartono, Ph.D. Vice Rector Universitas Tarumanagara

#### 2. Organizing Committee

Chairman	Dr. Hugeng, S.T., M.T.
Secretary	1. Bagus Mulyawan, M.M. 2. Wulan Purnama Sari, M.Si.
Proceeding & Scientific Session	1. Dr. Hetty Karunia Tunjungsari 2. Sinta Paramita, SIP., M.A. 3. Mariske Myeke Tampi, S.H., M.H.
Program	1. Dr. Fransisca Iriani R. Dewi 2. Mei Ie, S.E., M.M. Wulan Purnama Sari, M.Si.
Treasurer	1. Maitri Widya Mutiara, S.Ds., M.M. 2. A.R. Johnsen F.
Design & Publication	Herlina Budiono, S.E., M.M.
Sponsorship	

#### 3. Editorial Board

Prof. Alexander Ferrein	University of Applied Sciences Aachen, Germany
Dr.-Ing. A. Ruggeri Toni Liang	Karlsruhe Institute of Technology, Germany
Dr. -Ing Stephan Herzog	TU Kaiserslautern, Germany
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Prof. Eko Sedyono	Universitas Kristen Satya Wacana, Indonesia
Prof. Tjokorda Gde Tirta Nindhia	Udayana University, Indonesia
Dr. Rianti Ariobimo	Universitas Trisakti, Indonesia
Dr. Richard Napitupulu	Universitas HKBP Nommensen, Indonesia
Prof. Dyah Erny Herwindiati	Universitas Tarumanagara, Indonesia
Prof. Leksmono Suryo Putranto	Universitas Tarumanagara, Indonesia
Harto Tanujaya, Ph.D	Universitas Tarumanagara, Indonesia
Jap Tji Beng, Ph.D	Universitas Tarumanagara, Indonesia
Lina, Ph.D	Universitas Tarumanagara, Indonesia
Dr. Steven Darmawan	Universitas Tarumanagara, Indonesia
Dr. Widodo Kushartomo	Universitas Tarumanagara, Indonesia



## 4. TOPIC AREA

Scientific fields of the implementation of Tarumanagara International Conference on the Applications of Technology and Engineering 2020 (TICATE 2020) are as follows:

Track	Subtrack
Mechanical Engineering and Technology	Hydraulic and Pneumatics System; Fluids & Thermal Systems; Dynamics and Mechanical Vibrations; Mechanical Design and Manufacturing; Microsystems Integration; Cooperative Intelligent Systems; Advances for Process Industries; Power Generation – Conventional and Renewable; Computer Integrated Manufacturing; Design and Manufacturing Engineering; Industrial and Systems Engineering; Mechatronics and Automation; Operations Research; Production Planning and Control; Textile and Leather Technology
Electrical Engineering	Power Generation; Transmission and Distribution; Power Electronics, Systems and Applications; Electrical Machines and Adjustable Speed Drives; Electrical Power Systems; Circuits and Systems; Communication Systems; Analog and Digital Electronics; Electric Drives and Control; Instrumentation Engineering; Power System Engineering; Smart Grids Technologies & Applications; Computer Application Technology; Control Technology; Telecommunication Engineering; Network Engineering Communication; Signal and Image Processing; 4G/3G/LTE Mobile Networks Applications; Renewable Energy Sources, Smartgrids Technology & Application; High Voltage Engineering and Insulation Technology Controls

Track	Subtrack
Industrial Engineering	Quality Engineering & Management (QM), Supply Chain Management, operation research (OR), Decision Support System and Artificial Intelligence (DSS & AI), Production System (PS), Industrial Management (IM), Ergonomics (ER)
Civil and Environmental Technology	Bridge and Tunnel Engineering, Geotechnical Engineering, High-rise Structure and Large-span Structure, Modern Trends in Civil Eng., Structural Engineering, Surveying, Transportation Engineering, Water resource Engineering, Coastal Engineering, Computational Mechanics, Construction Technology, Engineering Management, Environmental Management, Environment-Friendly Construction and Development, Hydraulic Engineering, Safety Management
Food and Agriculture Technology	Agricultural Machinery, Biotechnology, Bio Fuel, Food Processing, Food Safety, Technologies in secure food packaging, Irrigation & water management, Forest and Natural Resource Management, New strategies in food packaging
Informatic Engineering and Technologies	Computer Application Technology, Software Engineering, Multimedia Technology, Mobile Computing, Artificial Intelligence, Computer Vision, Information Systems, Database Systems
Medical & Health Technology	Active Implantable Technology, Electromechanical Medical Technology, Hospital Hardware, Ophthalmic and Optical Technology, Dental Technology, Laboratory Equipment, Reusable Instruments, Technical Aids for Disabled

## 5. PROGRAM AT A GLANCE

### Tarumanagara International Conference on the Applications of Technology and Engineering Jakarta, 3-4 August 2020

Day, 1 (3 August 2020)

Time	Activity
08.00 – 09.00	Registration
09.00 – 09.15	<b>Opening Ceremony</b> Singing “National Anthem” & “ Mars Tarumanagara” Report from Chairman: Dr. Hugeng (SMIEEE)
09.15 – 09.30	<b>Welcome Speech:</b> Rector of Universitas Tarumanagara Prof. Dr. Ir. Agustinus Purna Irawan, Asean Eng. <b>Untar Video Profile</b>
09.30 – 12.00	<b>Keynote Speaker</b> Prof. Ir. Dr. Lee Sze Wei President, Tunku Abdul Rahman University College, Malaysia  Prof.Dr.Ir. Tresna P. Soemardi, S.E., M.S. Universitas Indonesia, Indonesia  Prof. Marco M. Polo Director, University Advancement Office De La Salle University-Dasmariñas Philippines  <b>Invited Speaker</b> Dr. Linda Lin Chin Lin Kun Shan University, Taiwan Dr. Eko Harry Susanto, M.Si Universitas Tarumanagara, Indonesia  <b>Moderator:</b> Lina,ST., M.Kom., Ph.D
12.00 – 13.00	Break
13.00 – 15.00	Paper Presentation Session I
15.00 – 15.15	Break
15.15 – 17.00	Paper Presentation Session II

Day 2, 4 August 2020

Time	Activity
08.00 – 08.30	Registration
08.30 – 12.00	Paper Presentation Session III

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus 2020

Room : Conference Room 1  
Time : 13.00 – 15.00  
Track : Civil and Environmental Engineering

NO	SCHEDULE	PAPER TITLE	AUTHOR	INSTITUTION
1	13.00-13.15	Calculation of Change Order for Road Projects in Jakarta	Mega Waty, Hendrik Sulistio	Universitas Tarumanagara
2	13.15-13.30	Escalation Quality of Wooden Beams as Building Construction with Densification Technology	James Rilatupa, Rahmad Samosir, Sally S. Napitupulu	Christian University of Indonesia
3	13.30-13.45	Interior Design of National Library with Environmentally Sustainability Materials	Hartini Laswandi, Basuki Wibawa	Universitas Tarumanagara
4	13.45-14.00	Development of Risk-Based Standardized WBS (Work Breakdown Structure) for Safety Planning of Coal Mine Project with Surface Mining Method	Faqih Andy Maulana, Yusuf Latief	University of Indonesia
5	14.00-14.15	Development of WBS Dictionary and Checklist Based on WBS of Railway Construction for Safety Planning	D V Aryanto, L S R Supriadi, Y Latief	University of Indonesia
6	14.15-14.30	Analysis of Design Paradigms Based on Technology Features at Galeri Indonesia Kaya	Andreas Yanuar Wibisono, Rudy Trisno, Fermanto Lianto	Universitas Tarumanagara
7	14.30 – 14.45	Development of WBS (Work Breakdown Structure) Dictionary and Checklist for Safety Planning of Tunnel Construction	N A Dewi, L S R Supriadi, Y Latief	University of Indonesia
8	14.45 – 15.00	Identification of E-Maintenance Elements and Indicators that Affect Maintenance Performance of High Rise Building: A Literature Review	Nurul Inayah Wardahni Yusuf Latief, Leni Sagita Riantini, Rossy Armyn Machfudiyanto	University of Indonesia

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 2  
Time : 13.00 – 15.00  
Track : Civil and Environmental Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	13.00-13.15	Recommendation of Furniture Layout in The Elderly Bedroom at Wisma Mulia Nursing Home	Fanny Budiyanto, Eddy Supriyatna, Rudy Trisno	Universitas Tarumanagara
2	13.15-13.30	Development of WBS Dictionary and Checklist Based On WBS (Work Breakdown Structure) on Support Facilities in Dam Construction Works For Safety Planning	B F Azzahra, L S R Supriadi, Y Latief	University of Indonesia
3	13.30-13.45	Reinvigorate Identity Through Metaphor Concept & Construction Technology in Bali's Resort Design	L Nuramin, F Lianto, R Trisno	Universitas Tarumanagara
4	13.45-14.00	Ornaments as Visual Sacred Expressions in Jakarta Cathedral Church	V U Sularko, R Trisno, J E D Rilatupa	Universitas Tarumanagara
5	14.00-14.15	Dialogue-Human Needs: The Relationship Between Apartment Design and Occupants Behaviour	Kevin Tanamas, Samsu Hendra Siwi, Fermanto Lianto, Martinus Bambang S.	Universitas Tarumanagara
6	14.15-14.30	Accessibility Study of Fire Evacuation at Dukuh Atas MRT Station	A Muqorrobin, E Supriyatna, F Lianto, N. W. Priyomarsono	Universitas Tarumanagara
7	14.30 – 14.45	Guidelines for Concept of Settlement Design with Digital Infrastructure Facilities	I Mulyana, F Lianto, S Gunanta	Universitas Tarumanagara
8	14.45 – 15.00	Floating Neighbourhood to Anticipate Jakarta Flooding	Donny Victorianus, Naniek Widayati, Eddy Supriyatna	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 3  
Time : 13.00 – 15.00  
Track : Civil and Environmental Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	13.00-13.15	Reintroducing Urban Wildlife through Green Façade Technology in Vertical Housings	Rio Sanjaya, Samsu Hendra Siwi, Fermanto Lianto, Martinus Bambang S.	Universitas Tarumanagara
2	13.15-13.30	The effectiveness of special Carriages for Female in Protecting Female Train Passengers	L S Putranto, A N Tajudin	Universitas Tarumanagara
3	13.30-13.45	Identification of E-Maintenance Elements and Indicators that Affect Maintenance Performance of High Rise Building: A Literature Review	Nurul Inayah Wardahni, Yusuf Latief, Leni Sagita Riantini, Rossy Armyn Machfudiyanto	University of Indonesia
4	13.45-14.00	Assessment of Existing Urban Drainage System Under Contemporary Rainfall in Tangerang, Indonesia	V Kurniawan, W A Pranoto	Universitas Tarumanagara
5	14.00-14.15	Critical Buckling Load Analysis on Spherical Shells Under Various Geometric Imperfections	Lilieek Darmawan, Leo S Tediarto	Universitas Tarumanagara
6	14.15-14.30	Study of Flood Discharge due to Land Use and Population Change of Way Pisang Watershed	Lilik Ariyanto, Agustinus Purna Irawan	Universitas Tarumanagara
7	14.30-14.45	The Effect of Using Composite Column for Enhancing Structural Stiffness	Christian Juniarto, Sunarjo Leman	Universitas Tarumanagara
8.	14.45– 15.00	Deep Excavation in Very Soft Soil Using Cross Wall as Lateral Support	Oktaffian Widjaja, Chaidir Anwar Makarim	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 4  
Time : 13.00 – 15.00  
Track : Civil and Environmental Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	13.00-13.15	Utilization of Rainwater Harvesting for Groundwater Conservation in Educational Building	Endah Lestari, Rr. Mekar Kinasti, Desi Putri	Institute Technology PLN
2	13.15-13.30	Effects of Opening Dimension in Shear Wall on The Behaviour of High-Rise Building Structure due to Earthquake Load	Fathur Rohman, Sunarjo Leman	Universitas Tarumanagara
3	13.30-13.45	The Role Funding Based Non Cash Loan in The Form of Supply Chain Financing on Elevated Road Project Performance (Case study Join Operation Project PT.X)	Sesde Asrul Stan, Leni Sagita	University of Indonesia
4	13.45-14.00	Dynamic Response of Rigid Pavement Plate due to Localized Blast Load	Anjas Budi Priono, Sofia W. Alisjahbana	Universitas Tarumanagara
5	14.00-14.15	4D BIM implementation to Improve EPC Project Performance from Contractor's Perspective. A case study	Maretha Piselia	University of Indonesia
6	14.15-14.30	Embossment Effect Analysis on Compression of Mild Steel Using Finite Element Methods	Altheo Darmawan, Sunarjo Leman	Universitas Tarumanagara
7	14.30-14.45	Model Selection of Online Motorcycle Taxi and Motorcycle Modes on Work Trips	Risdiyanto, Ahmad Munawar, M Zudhy Irawan, Aji A.Nugraha	Universitas Islam Indonesia, Universitas Gadjah Mada, Universitas Janabadra
8	14.45-15.00	The Effect of Online Food Ordering to Home Based and Non-Home-Based Trip	Leksmono Suryo Putranto, Vincentius	Universitas Tarumanagara
9	14.45 – 15.00	Mechanical Characteristics of The Asphaltic Concrete Mixture with The Addition of Steel Fibers	Joshua Christabel Pardamean, Anissa Noor Tajudin	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 5  
Time : 13.00 – 15.00  
Track : Mechanical & Industrial Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	13.00-13.15	SPHC Material Inventory Control Analysis in Project VI01 Centralized By The EOQ Method In Automotive Company Indonesia	Bethriza Hanum, Jakfat Haekal, Dian Eko Prasetyo	Universitas Mercu Buana, Universitas Islam As-Syafiyyah
2	13.15-13.30	Application of Single Minute Exchange of Die (SMED) on HPDC DC350T Line Casting to Reduce Changeover Time of Dies Engine Block	Hendra, Fandi Irawan Setioko, Yogy Yayang Saputra, Moh. Haris, Dady Kadarsan, Hernadewita	University of Sultan Ageng Tirtayasa, Mercu Buana University
3	13.30-13.45	Implementation of Quality Function Deployment (QFD) to Improve Service Quality at Marine Cilandak Hospital	Hermiyetti, Jacob Indra Efraldi, Chiven, Rahmawati, Ramli, Hernadewita	University of Bakrie, Mercu Buana University
4	13.45-14.00	Overall Equipment Effectiveness (OEE) and Six Big Losses Analysis in Laboratory Industry: A Case Study in PT. IUS Jakarta	Hernadewita, Afifulloh, Susiyanti Nurjanah, Ahmad Rozak, Amalina Shadrina, Hendra	Mercu Buana University, University of Sultan Ageng Tirtayasa
5	14.00-14.15	Experimental Study on The Crashworthiness Response of Hybrid Al/GFRP Crash Box Structures Under Axial Compression Loading	Citra Asti Rosalia, Ichsan Setya Putra, Tatacipta Dirgantara, Annisa Yusuf, Bambang K. Hadi	Institut Teknologi Bandung
6	14.15-14.30	Forecasting using Artificial Neural Networks and Aggregate Production Planning and Dynamic Model of Inventory Control for Rib and Single Knit Fabric	Lina Gozali	Universitas Tarumanagara
7	14.30-14.45	Suggestion of Raw Material Warehouse Layout Improvement using Class-Based Storage Method (Case Study of PT XYZ)	Lina Gozali, Iveline Anne Marie, Natalia	Universitas Tarumanagara
8	14.45– 15.00	A Proposal of Image-Based Measurement instead of Laser-Based Measurement for Indoor Application	John Reigton Hartono, Oei Fuk Jin	Universitas Tarumanagara



PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 6  
Time : 13.00 – 15.00  
Track : Mechanical & Industrial Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	13.00-13.15	Raw Materials Inventory Analysis with Bayes-Fishbone and Safety Stock in PT. Sinar Antjol	M Djuhana, L Gozali	Universitas Tarumanagara
2	13.15-13.30	Quality Control for PT Straightway Primex with Bayes Fishbone method and Analysis Control Chart	Maria Charista, Lina Gozali	Universitas Tarumanagara
3	13.30-13.45	Application of MRP System for Control of Raw Material Inventory with EOQ Lot Sizing	Andre Jonathan Christifan, Lina Gozali	Universitas Tarumanagara
4	13.45-14.00	Line Balancing Analysis on Finishing Line Dabbing Soap at PT. XYZ	Stephanie Alexandra, Lina Gozali	Universitas Tarumanagara
5	14.00-14.15	Aerodynamics Analysis of Mobil Irit Tarumanagara using CFD Method	Poppy Kesuma, Steven Darmawan, Agus Halim	Universitas Tarumanagara
6	14.15-14.30	Analysis of Shell and Tube Heat Exchanger Type	Harto Tanujaya, Abrar Riza	Universitas Tarumanagara
7	14.30-14.45	Flow Investigation of Cross-Flow Turbine using CFD Method	Joshua Aditya Sardjono, Steven Darmawan, Harto Tanujaya	Universitas Tarumanagara
8	14.45– 15.00	Online and Offline Website-Based Business System Design For Skin Care SME In Tsabita Store	Farhan Aiman, Endang Chumaidiyah, Yudha Prambudia	Telkom University

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 7  
Time : 13.00–15.00  
Track : Mechanical and Industrial Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	13.00-13.15	Determination of Minimum Trucks and Routes Used in The Case of Municipal Solid Waste Transportation in Bandung City With Greedy Algorithm	Nur Alim Habibi, Ari Yanuar Ridwan, Erlangga Bayu Setyawan	Telkom University
2	13.15-13.30	Performance of Generator Translation and Rotation Motion on Vertical Direction for Sea Wave Power Plant	Anizar Indriani, Hendra, Yeni Suhartini, Rispani, Hernadewita	University of Bengkulu, University of Sultan Ageng Tirtayasa, Mercu Buana University
3	13.30-13.45	Design Development of Financial Citizenship Model for Women in Indonesia	Ignatius Roni Setyawan, Ishak Ramli, Indra Listyarti	Untar, Perbanas Surabaya
4	13.45-14.00	Optimalization Injection Moulding Parameter Process Using General Factorial Design in Small Medium Enterprise Industries	Lithrone Solomon	Universitas Tarumanagara
5	14.00-14.15	Automation Systems in Automatic Assembling Gear Shaft Output as Car Gearbox Part at PT. Matahari Megah	Kevin Raynaldo, Steven Darmawan, Agus Halim, Asih Nugroho	Universitas Tarumanagara
6	14.15-14.30	Quality Control on Bucket Production Process Using Quality Tools Method (Case Study: A Medium Sized Company)	Avriana Handriany, Wilson Kosasih	Universitas Tarumanagara
7	14.30– 14.45	Analysis of Welding Strength S45C Material in Spot Welding Process with Variations in Welding Press Time and Electrode Diameter	Sobron M.Lubis, Rosehan, Styven Erlely	Universitas Tarumanagara
8	14.45-15.00	Multiple Linear Regression Analysis On Effect Of Time Variations And Voltage Variations On Spot Welding Against Shear Strength Of Aa5083 Material Using IBM SPSS Application	Gugun Wiranto, Sobron Y Lubis, Rosehan	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 8  
Time : 13.00 – 15.00  
Track : Mechanical and Industrial Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	13.00-13.15	Quality Management System in Automatic Machine Construction Based on ISO 9001	Meivi Venisa Gosan, Wilson Kosasih	Universitas Tarumanagara
2	13.15-13.30	Impact of Commercially Popular Machine Mechanisms Using Simulation Tool in Computer Aided Design for Improvements in Mechanical Engineering Curriculum	Amit L Talli, Ahmed A. Hussien, Mazlan Mohamed, Ayub Ahmed Janvekar	VIT University
3	13.30-13.45	Assembly Line Balancing with The Yamazumi Method	Silvi Ariyanti, M. Rifa'i Azhar, Igna Saffrina Fahin	Mercu Buana
4	13.45-14.00	Automated Image Analysis and Improvisations to Manage Palm Oil Plantation	M N Akhtar, S. A. Khan, Mazlan Mohamed, Ayub Ahmed Janvekar	Universiti Sains Malaysia, International Islamic University, Universiti Malaysia Kelantan, VIT University
5	14.00-14.15	Comparation Study Performance Diesel Engine Using Biodiesel with Secondary Data	Iqbal Muhammad Febriansyah	Universitas Tarumanagara
6	14.15-14.30	Ergonomic Analysis by Using REBA, WERA and Biomechanics Method In The Production Process of Women's Bag in Small Industry (SME)	Lamto Widodo, Adianto, Yenita, Christian Ruslie	Universitas Tarumanagara
7	14.30– 14.45	The Design of Coffee Grinder Machine Knockdown with 8 Levels of Coarseness	Frans Jusuf Daywin, Lina Gozali, Carla Olyvia Doaly, Adnan Salim, Abdurra Ibrahim, Maria Fatima, Pingkan Ingrid	Universitas Tarumanagara
8	14.45-15.00	Minimization Total Tardiness in Lathe and Turret Department Using Genetic Algorithm	I Gede Wira Ranata, Dida Diah Damayanti, Murni Dwi Astuti	Universitas Telkom Bandung

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus , 2020

Room : Conference Room 1  
Time : 15.15 –17.00  
Track : Mechanical and Industrial Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	15.15-15.30	Proposed Assembly Line Balancing of Union Fuselage using Mixed Integer Programming to Minimize Idle Time in NC212 Plant PT. Dirgantara Indonesia	Ni Putu Cynthia Sasmita Dewi, Dida Diah Damayanti, Murni Dwi Astuti	Universitas Telkom Bandung
2	15.30-15.45	Bamboo Composite Compressive Strength with Three Layer Configuration	Sofyan Djamil, NPG Suardana, Agustinus P. Irawan, IKG Sugita, Sobron Y Lubis, Dicky T.	Universitas Tarumanagara, Universitas Udayana
3	15.45-16.00	Assembly Line Balancing Using Genetic Algorithm Method to Minimize Number of Working Stations: A Case Study in Car Manufacturing	Dida Diah Damayanti, Murni Dwi Astuti, Erlangga Bayu Setyawan	Universitas Telkom Bandung
4	16.00-16.15	Repair Techniques in Underwater Pipelines for Drinking Water	Tri Suyono, Agustinus Purna Irawan, Wati Asriningsih Pranoto	Universitas Tarumanagara, Universitas Khairun
5	16.15-16.30	Development Method for Nickel Electroplating on Aluminium	Tjokorda Gde Tirta Nindhia, Dewa Ngakan Ketut Putra Negara, I Wayan Agus Saputra, Pradeep Kr. Sharma	Universitas Udayana, DKN Modi University
6	16.30-16.45	The Effect of Sea Water Corrosion on Tensile Strength of Combination Welded Joint of Stainless Steel 304-201	Tjokorda Gde Tirta Nindhia, I Wayan Surata, I Wayan Bandem Adnyana, I Gusti Komang Dwijana	Universitas Udayana
7	16.45-17.00	Failure Analyses on Corrosion of Hot Water Tank Storage Made for Stainless Steel	Tjokorda Gde Tirta Nindhia, I Putu Widya Semara, I Wayan Bandem Adnyana, Wayan Surata, I Gusti Komang Dwijana	Universitas Udayana

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 2  
Time : 15.15 –17.00  
Track : Mechanical and Industrial Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	15.15 - 15.30	Optimization of Kevlar and Coir Fibre Reinforced with Epoxy Based Composites to Improve Machining Characteristics - A Review	Vinaykumar M.J., Dr. Srikantappa A.S., Ramkumar M.	Cauvery Institute of Technology, Sapthagiri College of Engineering
2	15.30-15.45	Improving The Quality of Coffee Shops in Jabotabek Area By Application and Modification of Coffee Roaster Machine Capacity 400-600 Gram Coffee Beans Using The Reverse Engineering and Engineering Design Method	Frans Jusuf Daywin, Carla Doaly, Lina Gozali, Wilson Kosasih, Guswiyanta Taek	Universitas Tarumanagara
3	15.45-16.00	Planning and Realization of Learning Modules as Extracurricular Activities of Biped Robot	Joni Fat, Denny Kristian, Dali S. Naga	Universitas Tarumanagara
4	16.00 - 16.15	Experimental Study on Luminous Intensity of White LEDs of Different Configurations	Md. Abdul Alim, M.Z. Abdullah, M.S. Abdul Aziz, R. Kamarudin, A.P. Irawan, E. Siahaan	Universiti Sains Malaysia, Universitas Tarumanagara
5	16.15 - 16.30	Proposed Improved Product of Cake Pan Using The Six Sigma Method Approach (Case Study of PT. Suggo Metal Cemerlang)	I Wayan Sukania, Frans Jusuf Daywin, Alvindo Wijaya	Universitas Tarumanagara
6	16.30 - 16.45	Quality Control of Steel Deformed Bar Product Using Statistical Quality Control (SQC) and Failure Mode Effect Analysis (FMEA)	Mislan, Humiras Hardi Purba	Universitas Mercu Buana
7	16.45 -17.00	Design and Realization of Sound Level Meter Calibration Equipment Based on Microcontroller	R. Bayu Ramada Meikaharto, Endah Setyaningsih, Henry Candra	Universitas Tarumanagara
8	17.00 -17.15	On the performance of air conditioner with cold coil for cooling in the condenser	Parulian Siagian1*, Richard A M Napitupulu 1, H V Sihombing2, Eko Y Setiawan3, Saloom Hilton Siahaan4, Risma Sinaga5, Syofyan Anwar Syahputra6	1 Universitas HKBP Nommensen, 2 Universitas Sumatera Utara, 3 Mechanical Engineering National Institute of Technology Malang, 4Universitas HKBP Nommensen, 5 Akademi Teknik Deli Serdang, Lubuk Pakam

PARALLE SESSION SCHEDULE  
Monday, 3 Agustus, 2020

Room : Conference Room 3  
Time : 15.15 –16.45  
Track : Informatic Engineering & Technologies

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	15.15-15.30	A Rule-Based Decision Support System To Analyse People's Behaviour While Undergoing The Work From Home During The COVID-19 Period	Henderi	Universitas Raharja
2	15.30-15.45	Face Anti-Spoofing Method with Blinking Eye and HSV Texture Analysis	Raden Budiarto Hadiprakoso	Politeknik Siber dan Sandi Negara
3	15.45-16.00	Design a Group Decision Support System Model to Determine Accreditation of Early Childhood Education Institutions	Muhammad Syaukani, Abdul Kadir	STMIK Indonesia Banjarmasin, STIKES Cahaya Bangsa Banjarmasin.
4	16.00-16.15	Implementation of Hybrid Method of Eckenrode and DIA for the Determination Customer Class	Abdul Kadir, Muhammad Syaukani	STIKES Cahaya Bangsa Banjarmasin, STIMIK Indonesia Banjarmasin
5	16.15-16.30	Exploration of The Security of Free Data Encryption Applications for Cloud Storage	Eka Hero Ramadhani, Herman Kabetta, Amiruddin Amiruddin	Politeknik Siber dan Sandi Negara
6	16.30-16.45	Development of Web Crawler to Build Indonesian Text Corpus	Janson Hendryli, Viny C Mawardi	Universitas Tarumanagara
7	16.45-17.00	Implementation of Lashkari et al Scheme and Convergent Encryption on Cloud-Based Secure Deduplication Application	Rico Setyawan, Hermawan Setiawan	Politeknik Siber dan Sandi Negara

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus , 2020

Room : Conference Room 4  
Time : 15.15 –17.00  
Track : Informatic Engineering & Technologies

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	15.15-15.30	Model Expert System for Diagnosis of COVID-19 Using Naïve Bayes Classifier.	Didin Silahudin	Universitas Raharja
2	15.30-15.45	Learning The Basic Structure of Several Ransomwares Using Static Analysis Technique	Amiruddin Amiruddin, Candra Kurniawan, Eka Hero Ramadhani, Julio Rinaldi	Politeknik Siber dan Sandi Negara
3	15.45-16.00	Application of Opinion Classification for Fast-food Restaurant Popularity Using Social Media Instagram	Elvandio Frinandy, Dedi Trisnawarman, Ery Dewayani	Universitas Tarumanagara
4	16.00-16.15	Legal Institution Mapping Information System in DKI Jakarta	Muhamad Arda Billy, Dedi Trisnawarman, Tri Sutrisno	Universitas Tarumanagara
5	16.15-16.30	Real-Time Information System Basic Needs Price Change Predictions in The Traditional Market	Reza Mukhlis Qurbany, Dedi Trisnawarman, Tri Sutrisno	Universitas Tarumanagara
6	16.30 - 16.45	Decision Support System for Election and Evaluation of Assistant Lecturer Using Analytical Hierarchy Process and Simple Additive Weighting: case study Faculty of Information Technology Tarumanagara University	Melvin, Tri Sutrisno, Dyah Erny Herwidianti	Universitas Tarumanagara
7	16.45 – 17.00	Development of Automatic Landsat Data Download Engine	K.A. Pradono, Y.D. Safitri, B.S. Adhitama, Y F Hestrio, M. Soleh, H. Gunawan, N. Widiyatmiko, W. Sunarmodo	Pusat Teknologi dan Data Penginderaan Jauh LAPAN

PARALLEL SESSION SCHEDULE

Monday, 3 Agustus , 2020

Room : Conference Room 5  
 Time : 15.15 –17.00  
 Track : Informatic Engineering & Technologies

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	15.15-15.30	Accuracy Comparison Methods Between Putro's Method with Husain's Method for Validating Damaged Physical Documents	Prasetyo Adi Wibowo Putro, Andi Parada Tambunan, Pandu Bagus Diancaraka, Wian Agus Satria Pratama	Laboratory of Cryptographic Software Engineering, National Polytechnic Cyber and Crypto Institute.
2	15.30-15.45	A Web-Based Online Store Application for Fabric Material Sales	Alfonso, Dali Santun Naga, Zyad Rusdi	Universitas Tarumanagara
3	15.45-16.00	Website Application for Locating and Reserving House and Boardroom for Rent Based on Selected Location or Region	Fensen, Eri Dewayani, Wasino	Universitas Tarumanagara
4	16.00-16.15	Android-Based Application for Intangible Cultural Heritage in Balai Pelestarian Nilai Budaya Jawa Barat	Jayson, Ery Dewayani, Zyad Rusdi	Universitas Tarumanagara
5	16.15-16.30	E-Commerce Application for Selling "Blue Salt" Products and General Fish Maintenance Tools for Koi Fish Treatment	Martinus Budiman, Dali Santun Naga, Zyad Rusdi	Universitas Tarumanagara
6	16.30 - 16.45	Web-Based Inventory Information System in Antarika Stores	Devan Ariesta, Zyad Rusdi, Tri Sutrisno	Universitas Tarumanagara
7	16.45 – 17.00	Analysis Forensic of Instagram on Android	Carolin Alisabeth, Yogha Restu Pramadi	Politeknik Siber dan Sandi Negara



PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus , 2020

Room : Conference Room 6  
Time : 15.15 –17.00  
Track : Informatic Engineering & Technologies

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	15.15-15.30	Development of Tarumanagara University Tracer Study Information System	Muhamad Hafiz, Ery Dewayani, Wasino	Universitas Tarumanagara
2	15.30-15.45	A Study on Windows-Based Ransomware Implication On Linux Operating System Using Compatibility Layer Wine Based on Dynamic Analysis	Rycka Septiasari, Yogha Restu Pramadi	Politeknik Siber dan Sandi Negara
3	15.45-16.00	Web based food Combination System for Diabetes Mellitus Type 2 with Genetic Algorithm	Kevin Kuwito, Desi Arisandi, Novario Jaya Perdana	Universitas Tarumanagara
4	16.00-16.15	Adventure Game "Detective Adventure" Using Unity Virtual Reality	Yohanes, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
5	16.15-16.30	Development of Android Arcade Game "Game Protector" with Touch Gesture Recognizer	Andrean Danawan, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE  
Monday, 3 Agustus , 2020

Room : Conference Room 7  
Time : 15.15 –17.00  
Track : Informatic Engineering & Technologies

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	15.15-15.30	Android Musical Puzzle Game "Music Puzzle"	Ewaldo Filbert, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
2	15.30-15.45	Android Rhythm VR Game "Sabeat"	Yobel Octavinus, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
3	15.45-16.00	Android Puzzle Game "Digitus"	Christine, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
4	16.00-16.15	Classification of Historic Buildings in Indonesia with the Optimization of SVD Methods Based on Texture and Color Characteristics (Care : Temples, Historic Mosques, Historic Churches, and Historic Confucian Temples)	Hadiyanto, Manatap Dolok Lauro, Dyah Erny Herwindiati	Universitas Tarumanagara
5	16.15-16.30	Development of Platformer Endless Running Game "Endless Jetride" on Android	Jason, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
6	16.30-16.45	Android Arcade-Style Racing Game "CarsTime" with Antigravitation	Michael, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
7	16.45-17.00	Website Based Application of Doctor Selection Classification Derive from Patient Complaints Using the C4.5 Method and K-Nearest Neighbour	Hendri, Viny Christanti Mawardi, Dali Santun Naga	Universitas Tarumanagara
8	17.00 – 17.15	Decision Support System of Food Selection for Obese Sufferer	Yohan Ivandri Yuana, Dedi Trisnawarman, Tri Sutrisno	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE  
Tuesday, 4 Agustus 2020

Room : Conference Room 1  
Time : 08.30 – 12.00  
Track : Civil & Environmental Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	08.30-08.45	Earned Value Analysis on National Salt Warehouse Construction Project	Pramudita Budi Santoso, Hendrik Sulistio	Universitas Tarumanagara
2	08.45-09.00	Characteristics of Grocery and Daily Needs Shopping in Greater Jakarta	L S Putranto, D B E Dharmowiyono, P Anggita	Universitas Tarumanagara
3	09.00-09.15	Interest and Implementation of Construction Certification Law in Indonesia	Trisna Ekasartika ,Jason Lim, Iwan B.Santoso	Universitas Tarumanagara
4	09.15-09.30	The Implementation of Non-Unit-Based Scheduling Method in a Housing Project	Kevin Natanael Christiawan, Onnyxiforus Gondokusumo	Universitas Tarumanagara
5	09.30-09.45	The Implementation of Fuzzy Trapezoidal Critical Path Method in a Housing Project	James Kurniawan, Onnyxiforus Gondokusumo	Universitas Tarumanagara
6	09.45-10.00	Jelambar Third Place as Culinary Place with Green Contemporary Design Concept Approach	Charles Darwin, Rudy Trisno	Universitas Tarumanagara
7	10.15-10.30	Study of Selecting Floor Cover by Using the Value Engineering Method in the Housing Project	F L Labuan, M Waty	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE  
Tuesday, 4 Agustus 2020

Room : Conference Room 1  
Time : 08.30 – 12.00  
Track : Civil & Environmental Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
8	10.45-11.00	Study of Lighting, Humidity, and Ventilation in RISHA Design at Kampung Deret Petogoan, Jakarta	Fanuel Fang, M. Bambang Susetyarto, Fernando Lianto, Samsu Hendra Siswi	Universitas Tarumanagara
9	11.00-11.15	Co-Working Space with Biophillic Design Approach in Lot.6 SCBD, South Jakarta	C Simarmata, S Gunanta, T Fatimah	Universitas Tarumanagara
10	11.15-11.30	Analysis of Schedule Project Management's Indicators and Cost Project Management's Indicators in Interior Construction	Chaterine, Manlian Ronald A. Simanjuntak	Universitas Tarumanagara, Universitas Pelita Harapan
11	11.30-11.45	Effect of Outrigger & Belt Truss System on High-Rise Building Structure Performance	Donny Morris, Roesdiman Soegiarso	Universitas Tarumanagara
12	11.45-12.00	Analysis of Some Failure Reduction on Primary Pile in The Secant Pile System	D N Sunjaya and A J Susilo	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE

Tuesday, 4 Agustus 2020

Room : Conference Room 2

Time : 08.30 – 12.00

Track : Materials Sciences and Environmental Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	08.30-08.45	Energy Efficiency Effort at Dukuh Golf Kemayoran Apartement	Friska Hasibuan, Fermanto Lianto, Samsu Hendra Siwi, Martinus Bambang S.	Universitas Tarumanagara
2	08.45-09.00	The Study of Qualitative Analysis of Maintenance and Operation Management Processes of The Technical Office of Abdul Muis Building	Janerizka Bari Putri, Manlian Ronald A. Simanjuntak	Universitas Tarumanagara, Universitas Pelita Harapan
3	09.00-09.15	Accessible Toilet at Gambir Station	Fermanto Lianto, Eddy M. Supriatna, William, Fanny Budiyo	Universitas Tarumanagara
4	09.15-09.30	Clothesline on the Balcony of the Apartment and Its Effects	Fanuel Fang, M. Bambang Susetyarto, Fermanto Lianto, Samsu Hendra Siwi	Universitas Tarumanagara
5	09.30-09.45	Material Module Technology in Amartapura Apartment, Lippo Karawaci	Sidi Ahyar Wiraguna, M. B. Susetyarto, Fermanto Lianto, Samsu Hendra Siwi	Universitas Tarumanagara
6	09.45-10.00	Utilization of Compact-Convertible Furniture Module in Studio Type Apartment in M-Town Residence Summarecon Serpong	Vina Natalia, M. B. Susetyarto, Fermanto Lianto, Samsu Hendra Siwi	Universitas Tarumanagara
7	10.15-10.30	The potential use of Indonesian glutinous rice flour as nanoparticles organic filler for dental impression materials.	V Takarini, L A T W Asri, R Suratman, B K Hadi	Institut Teknologi Bandung, Universitas Padjadjaran

PARALLEL SESSION SCHEDULE

Tuesday, 4 Agustus 2020

Room : Conference Room 2  
 Time : 08.30 – 12.00  
 Track : Materials Sciences and Informatics Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
8	10.45 – 11.00	A study on The Response of High Aspect Ratio Composite Wing Structures Due to Gust Load	Matza Gusto Andika, Bambang Kismono Hadi, Rianto Adhy Sasongko	Institut Teknologi Bandung
9	11.00 – 11.15	Recognition of Pedestrian Traffic Light using Tensorflow And SSD MobileNet V2	Evan, Meirista Wulandari, Eko Syamsudin	Universitas Tarumanagara
10	11.15-11.30	Classification of Fertilizer Using OpenCV Based on Color Characteristic	Jovahn Shannich Charlie, Meirista Wulandari, Nurwijayanti	Universitas Tarumanagara
11	11.30-11.45	Sales Clustering and Sparepart Sales Prediction with Automatic Clustering Algorithm	Helmy Tirta, Bagus Mulyaman, Novario Jaya Perdana	Universitas Tarumanagara
12	11.45-12.00	Data Prediction For Coffee Harvest Using Least Square Method	Edi Surya Negara, Keni Keni, Ria Andryani	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE

Tuesday, 4 Agustus 2020

Room : Conference Room 3  
 Time : 08.30 – 12.00  
 Track : Informatics Engineering & Technologies

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	08.30-08.45	Classification of Flower Images Using SVM Method Through the Colour, texture, and Shape Using Histogram, Haar Wavelet and Robert Cross Methods	Joni, Dyah Erny Herwindiati, Janson Hendry li	Universitas Tarumanagara
2	08.45-09.00	Car Shape Clustering Using Sobel Edge Detection with Divisive Average Linkage and Single Linkage Algorithm (Case: Bus, Sedan, Citycar, Mpv, and Truck)	Victor Hadi Saputra, Dyah Erny Herwindiati, Tri Sutrisno	Universitas Tarumanagara
3	09.00-09.15	Implementation WASPAS for Recommendations on Salary Increases for Employees case study TOKO NASIONAL UTAMA	Kevin, Viny Christanti Mawardi, Manatap Dolok Lauro	Universitas Tarumanagara
4	09.15-09.30	Developing Android Action Game "I Am" Using Gyroscope and Augmented Reality	Ricky Yulianto, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
5	09.30-09.45	The Development of Android Impossible Platformer Game "My Unfair Adventure"	Kevin Alexander, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
6	09.45-10.00	The Simple Boxplot Method for an Effective Prediction	Reonaldo, Manatap Dolok Lauro, Dyah Erny Herwindiati	Universitas Tarumanagara
7	10.15-10.30	Product Choice Recommendation System in Building Materials Shopping Application with Web-Based FP-Growth Algorithm	Vionelsy	Universitas Tarumanagara
8	10.30-10.45	Implementation of Improved Apriori Algorithm for Drug Planograms in XYZ Pharmacies and Analysis of Medicinal Procurement Planning Using ABC Critical Index Methods	Aldy Pratama, Bagus Mulyawan, Tri Sutrisno	Universitas Tarumanagara
9.	10.45– 11.00	Application of the Case Based Reasoning & Sorensen-Dice Coefficient Method for Fitness Exercise Program	Dodi Salim, Bagus Mulyawan, Novario Jaya Perdana	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE

Tuesday, 4 Agustus 2020

Room : Conference Room 4  
 Time : 08.30 – 11.30  
 Track : Mechanical Engineering and Informatics Technology

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	08.30-08.45	Effect of Molybdenum Disulfide and Titanium Dioxide Fillers on The Tribological Behavior of Glass-Coir Hybrid Composites	Vijay B R, Dr. Skrikantappa A.S.	DinkyLabs Technologies Private Limited
2	08.45-09.00	Analysis of LED Wire Bonding During Encapsulation Process	Hafiz Roslan, M.S. Abdul Aziz, M.Z. Abdullah, R. Kamarudin, M.H.H. Ishak, F.Ismail, Agustinus Purna Irawan	Universiti Sains Malaysia, Universitas Tarumanagara
3	09.00-09.15	Tool Characteristics for Better Performance in Machining OHNS Steel Using Tungsten Carbide Tool Inserts	Shivakumara. C. M, Dr.Srikantappa. A. S., Dr.Adaveesha. B	Cauvery Institute of Technology, Siddaganaga Institute of Technology
4	09.15-09.30	Retrieval Based Chatbot on Tarumanagara University with Multiplayer Perceptron	Andrew Ciayandi, Viny Christanti Mawardi, Janson Hendryli	Universitas Tarumanagara
5	09.30-09.45	Application of Online Presence and Recommendations of Students That Have a Low Value Using The Multi-Objective Optimization Method on The Based of Ratio Analysis	Excel Tanwijaya, Dali Santu Naga, Viny Christanti	Universitas Tarumanagara
6	09.45-10.00	Beauty Clinic Recommendation System with CART Algorithm Based on Web Review with Naive Bayes Method	Tacana, Desi Arisandi, Tri Sutrisno	Universitas Tarumanagara
7	10.15-10.30	Fruit Maturity Classification Using Convolutional Neural Networks Method	Selly Anatya, Viny Christanti Mawardi, Janson Hendryli	Universitas Tarumanagara
8	10.30-10.45	Digital Communication of Chinese Millennial Generation in Building the Creative Economy of Surakarta	Sinta Paramita, Lydia Irena	Universitas Tarumanagara
9	10.45 – 11.00	Battery Charging Management System Design With Voltage, Current and Temperature Monitoring Features in Electric Vehicles	Yohanes Calvinus, Ferdian Wiryanata, Harlianto Tanujaya	Universitas Tarumanagara
10	11.00-11.15	Market Basket Analyst based on Website using Eclat Algorithm (Case Study Pola Pharmacy)	Edgar Lawrence ,Bagus Mulyawan, Novario Jaya Perdana	Universitas Tarumanagara
11	11.15 – 11.30	Development of E-commerce Web Application with Product Recommender System Using Genetic Algorithm	Ivan Sutjiadi, Bagus Mulyawan, Manatap Dolok Lauro	Universitas Tarumanagara



PARALLEL SESSION SCHEDULE  
Tuesday, 4 Agustus 2020

Room : Conference Room 5  
Time : 08.30 – 11.45  
Track : Civil & Environmental Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	08.30-08.45	Community Activity Center Which Prioritizes Socialization Activity in Kwitang, Central Jakarta	Stanly Manuel, Rudy Trisno	Universitas Tarumanagara
2	08.45-09.00	Cultural Park With The Concept of Combining The Betawi and Chinese Culture in Taman Sari, West Jakarta, Indonesia	Syarifa Andari, Rudy Trisno	Universitas Tarumanagara
3	09.00-09.15	Flea Market and Thrift Facility as a Third Place with Urban Retrofitting Approach in North Kebayoran Lama	Rinaryd Tanuwijaya, Rudy Trisno	Universitas Tarumanagara
4	09.15-09.30	Feasibility Study of Apartement for Millenial Generation at LRT Station Gunung Putri Kabupaten Bogor	Kent Demas Kynan	Universitas Tarumanagara
5	09.30-09.45	Analysis of Important Factors in Choosing or Using Process Alternative Dispute Resolution of Construction Project From Contractor's Perspective (Case Study in XYZ Company, Ltd's)	Daniel Dianto Aritonang, Manlian Ronald A. Simanjuntak	Universitas Tarumanagara
6	09.45-10.00	Cipete Raya Spatial Plan Sustainability and Converted Land Use	Dhaneswara Nirwana Indrajogja	Universitas Tarumanagara
7	10.15-10.30	Tarumanagara University Campus 1 Sky Bridge Structure Evaluation	Hadi Pranata, Jonathan Thomas	Universitas Tarumanagara
8	10.30-10.45	Risk Identification of Design and Build at School Building Construction Project in Central Jakarta	Andreas Suharyanto, Manlian Ronald A. Simanjuntak	Universitas Tarumanagara, Universitas Pelita Harapan
9	10.45 – 11.00	Risk Identification in Procurement of Precast on High Rise Buildings in Jakarta	Andreas Suharyanto, Manlian Ronald A. Simanjuntak	Universitas Tarumanagara, Universitas Pelita Harapan
10	11.00 – 11.15	Risk Identification in Procurement of Glass Facade in High-Rise Office Buildings in Jakarta	Andreas Suharyanto, Manlian Ronald A. Simanjuntak	Universitas Tarumanagara, Universitas Pelita Harapan
11	11.15 – 11.30	Seismic Evaluation of Buildings using Adaptive Force-Based Multimode Pushover Analysis	Albert, Daniel Christianto, Hadi Pranata	Universitas Tarumanagara
12	11.30-11.45	Design alternative on peat soil	Vicky Muroby, Chaidir Anwar Makarim	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE

Tuesday, 4 Agustus 2020

Room : Conference Room 6  
 Time : 08.30 – 11.45  
 Track : Mechanical Engineering and Information Technology

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	08.30-08.45	Design of CO, CO2 Temperature, Humidity, and Weather Monitoring System Based on Internet of Things (IoT) & Android	Christopher Calvin Ardianto, Yohanes Calvinus, Pono Budi Mardjoko	Universitas Tarumanagara
2	08.45-09.00	Simulation of Brushless DC Motor Controller in SEM Electric Car Prototypes	Andreas Stevanus, Yohanes Calvinus, Dali S. Naga	Universitas Tarumanagara
3	09.00-09.15	The Reduction Effect of Al-Cu Series 2024 on The Processing Rolled in Mechanical Properties	Erwin Siahaan	Universitas Tarumanagara
4	09.15-09.30	The effect of reduction cross section area and rolling temperature in mechanical properties of Al-Cu	Erwin Siahaan	Universitas Tarumanagara
5	09.30-09.45	The influences of Silver content in Lead-Free Solder Sn-0,7CuAg (SAC) in Physical and Mechanical Properties	Erwin Siahaan	Universitas Tarumanagara
6	09.45-10.00	Characterize of Corrosion Rate and Mechanical Properties of Low Carbon Steel in Potassium Chromate Solution.	Erwin Siahaan	Universitas Tarumanagara
7	10.15-10.30	Flowers of Sphagneticola Trilobata (L.) J.F Pruski from Aceh, Indonesia: Antioxidant and Cytotoxic Activity on HeLa Cells	Vivi Mardina, Mastura, Hamdani, Elly Sufriadi	Samudra University, Syiah Kuala University
8	10.30-10.45	Blade Tilt Angle Effect on Undershot Type Floating Micro Hydro	Eko Yohanes Setyawan, Soeparno Djiwo, Sandi Saputro, Richard A.M Napitupulu, Parulian Siagian	National Institute of Technology Malang, University of HKBP Nommensen
9	10.45 – 11.00	New Relationship between Linear Shrinkage and Shrinkage Limit for Expansive Soils	B Widjaja and C Chriswandi	Parahyangan Catholic University, Indonesia
10	11.00 – 11.15	Application of Individual Activity Recognition in the Room Using CNN Alexnet Method	Kerly Prastika, Lina	Universitas Tarumanagara
11	11.15 – 11.30	Application of Recommendations Students Needs Tutoring using The Multi-Objective Optimization Method on The Base of Ratio Analysis	Excel Tanwijaya, Dali Santu Naga, Viny Christanti	Universitas Tarumanagara
12	11.30-11.45	Determination Of Minimum Stock On System Retail Using Forecast, Economic Order Quantity And Reorder Point Methods	Michael Heaviside, Bagus Mulyawan, Tri Sutrisno,	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE  
Tuesday, 4 Agustus 2020

Room : Conference Room 7  
Time : 08.30 – 12.00  
Track : Informatic Engineering & Technologies

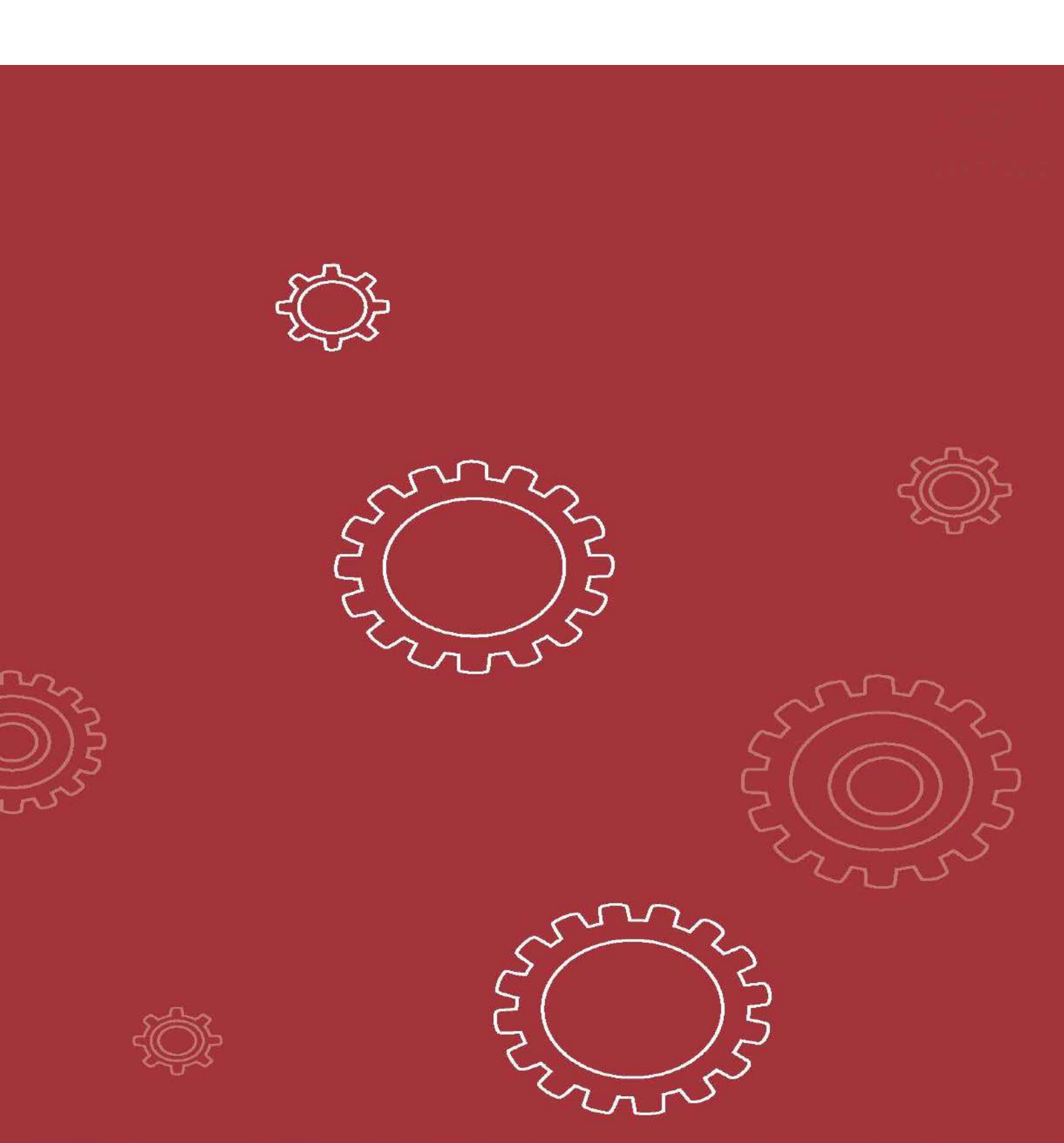
NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	08.30-08.45	Web Based Motorcycle Social Gathering	Joshua Ivannathan, Ery Dewayanti, Desi Arisandi	Universitas Tarumanagara
2	08.45-09.00	"Serenade Tower" Hack and Slash Game	Leonardo, Jeanny Pragantha, Darius Andana Haris	Universitas Tarumanagara
3	09.00-09.15	Application of Recommendation Medical Specialty Doctors Based on User Symptoms Using the C4.5 Method and K-Nearest Neighbor	Hendri, Viny Christanti Mawardi, Dali Santun N.	Universitas Tarumanagara
4	09.15-09.30	Web-based Live Chat Application uses Advanced Encryption Standard Methods and Rivest Shamir Adleman	Edwin Kho, Viny Christanti Mawardi, Novario Jaya Perdana	Universitas Tarumanagara
5	09.30-09.45	Resume Extraction with Conditional Random Field Method	Jason Anggakusuma, Viny Christanti Mawardi, Manatap Dolok Lauro	Universitas Tarumanagara
6	09.45-10.00	Business to Business E-Commerce Sales System Using Web-Based Quotation : A Case Study on Company X	Andreas Leovin, Jap Tji Beng, Ery Dewayani	Universitas Tarumanagara
7	10.15-10.30	Website-Based Information System for Mapping Restaurant or Eating Places in DKI Jakarta Using Google Maps	Charlie Chai, Jap Tji Beng, Desi Arisandi	Universitas Tarumanagara
8	10.30-10.45	Company XYZ Website-based Application to Improve Fish Marketing : A Case Study of On Site Direct Online Purchase	Febri Valentino, Jap Tji Beng, Wasino	Universitas Tarumanagara
9	10.45 – 11.00	Web-Based Canteen Payment and Ordering System	Fendy Fonggo, Jap Tji Beng, Desi Arisandi	Universitas Tarumanagara
10	11.00 – 11.15	Utilization of Apriori Algorithm for Book Layout Design in UNTAR Library	Varyan Sumarly, Desi Arisandi, Tri Sutrisno	Universitas Tarumanagara
11	11.15 – 11.30	Prediction of Credit Card Using the Naive Bayes Method and C4.5 Algorithm	Ketjie, Viny Christanti Mawardi, Novario Jaya Perdana	Universitas Tarumanagara
12	11.30-11.45	Forecasting Analysis At Pt. Lion Metal Works Using Artificial Neural Network	Andri Tan Wijaya, Fransiska Lefta, Lina Gozali, Frans Jusuf Daywin	Universitas Tarumanagara
13	11.45-12.00	Application of the SMART & Promethee Method for Recruitment of Prospective Employees at PT Kurnia Mutu Niagapratama	Kelvin Hendersen, Bagus Mulyawan, Manatap Dolok Lauro	Universitas Tarumanagara

PARALLEL SESSION SCHEDULE

Tuesday, 4 Agustus 2020

Room : Conference Room 8  
 Time : 08.30 – 11.45  
 Track : Civil & Material Engineering

NO	SCHEDULE	PAPER TITLE	AUTHORS	INSTITUTION
1	08.30-08.45	Safety Audit of Becakayu Toll Road	Ni Luh Putu Shinta Eka Setyarini, Aniek Prihatiningsih, Kevin Tanes	Universitas Tarumanagara
2	08.45-09.00	Development of Relationship between Liquid Limit and Clay Content for West Java Soils	B Widjaja, K Kurniawan	Universitas Katolik Parahyangan
3	09.00-09.15	Performance Evaluation of Dual System Structure with Belt Truss	Dwi Prasetyo Utomo, Roesdiman Soegiarso	Universitas Tarumanagara
4	09.15-09.30	Analysis the Effect of Pilling Activity Using Diesel Hammer on Surrounding Construction	Andera, A. Prihatiningsih	Universitas Tarumanagara
5	09.30-09.45	Conceptual Framework of Cloud Computing Implementaion On Start-Up Companies With TOE Approach	Hendro Lukman	Universitas Tarumanagara
6	09.45-10.00	Analysis of Settlement on Slab-on-Groud in Soil Strengthened Woth Dolken, Mangrove, and Bamboo Timber	M.F. Cheryl, A.J Susilo	Universitas Tarumanagara
7	10.15-10.30	WIM Data Analysis for Evaluation of The Fatigue Lifetime of Standard Steel Truss Bridge Elements	Endang Mulyadi, Made Suangga	Universitas Tarumanagara
8	10.30-10.45	Effectiveness of Additional Organic Waste on Expansive Soil Using Handheld Penetrometer and Free Sweel Test	A.C. Sofian, A. Prihatiningsih	Universitas Tarumanagara
9	10.45 – 11.00	High Tech Architecture Application in the Design of Tanjung Priok Bus Terminal	M. Syahroni, Surya Gunanta, Eddy Supriyatna	Universitas Tarumanagara
10	11.00 – 11.15	Wheelchairs in Gambir Station	Fermanto Lianto, Eddy M. Supriatna, William, Fanny Budiyanto	Universitas Tarumanagara
11	11.15 – 11.30	Optimizing Marine Tourism Port Function (Study Case : Muara Angke Port)	Celine, Naniek Widayati Priyomarsono, Samsu Hendra Siwi	Universitas Tarumanagara
12	11.30-11.45	Simulation and Study of Shell and Tube Type Heat Exchangers	Andriawan, Harto Tanujaya, Abrar Riza	Universitas Tarumanagara



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# Feasibility study of apartement for millennial generations at LRT Station Gunung Putri Kabupaten Bogor

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**Abstract.** This study aims to conduct a feasibility study of the planned development of apartment owned by PT. Bangun Global Pasifik on a 1.6 ha land in Gunung Putri, Kabupaten Bogor integrated with the Phase II LRT station plan. This Feasibility Study aims to determine the appropriateness of apartment development in terms of physical and legal, environmental, market and investment feasibility, emphasizing the specialization of studies on the feasibility of environmental health and investment with the concept of development in accordance with the criteria of the target consumers, the age group Millennial Generation (20- 40 years old). Based on the results of the feasibility study, it was found that the plan to develop millennial apartments at Gunung Putri was generally said to be physically, legally and marketly feasible, provided that there was a need for environmental mitigation planning in the form of planting pollutant-absorbing trees such as Trembesi and Vertical Garden. The concept carried for the apartment development plan has Millennial Generation characteristics such as supporting Social Community, Affordability Housing, Green concept and Integrity. The investment feasibility shows that the results of IRR, NPV, and PI look feasible by showing some alternatives and assumptions to get the results of choosing the best alternative for development. The results obtained will be used as parameters of the overall development feasibility and collect the synthesis of the best development concepts for the development plan.

## 1. Introduction

The concept of affordable housing integrated by Mass Transportation is becoming a trend in the suburbs of Jakarta, by the impact of the implementation of LRT, MRT and BRT. As LRT City by Adhi Karya became a pawn of the concept of developing the suburbs of Jakarta in the eastern and southern corridors of Jakarta through the utilization of the LRT station plan as a development concept. Land tends to have a lower price than Jakarta, is targeted by consumers in the Millennial Generation class, because millennials tend to choose affordable housing that can be covered by a unique payment scheme and their monthly income. The characteristics of millennials tend to be unique in choosing housing that is more concerned with ease of access, and simple practical lifestyles such as Mix Used Development, Green Development and availability of Open Space for Community and Work Activities. Therefore Millennials Occupancy begins to lead to Vertical and Rent. Demand from housing/residential for millennial generation can be seen from the potential housing needs in the demographic bonus in 2020 with the majority of the population in Jakarta being millennial age groups (20 - 40) years with a proportion of 37.5% of the total population of DKI Jakarta, Banten at 36.93% and West Java with 29.49% of the population. This study aims to conduct a feasibility study for the development concept of apartments for millennial generation on a 1.6 ha land in Gunung Putri, Kabupaten Bogor, which is in accordance with the criteria for millennial generation in habitable. The object of this study is only 1 (one) km away from the source of air pollution from the Cement Factory and right next to the Jagorawi

Toll Road, which is had a high level threats of ISPA and Faringitis, therefore an additional analysis is needed to mitigate environmental health it first.

## **2. Method and materials**

### *2.1 Data Compilation*

Data compilation is taken based on primary data and secondary data. Primary data is taken in the form of general physical data (land fields, environmental conditions) and specific data such as environmental health data (DLH, Bogor Regency and Puskesmas) through direct observation / survey and data on preferences and perceptions of millennial generation in choosing housing through a questionnaire. Secondary data taken from local and international journals and scientific studies obtained from the internet.

### *2.2 Distributing Milenial Questionnaires Method*

The method of distributing questionnaires is to take a sample of 100 populations taken in the Jabodetabek area with a millennial generation age classification that is at the age of 20-40 years old. Distributed questionnaire in the form of perceptions and preferences regarding the choice of residential criteria and the concept of vertical housing in accordance with the criteria of millennial generation. Confidence Level is 95% and generated with One Sample Test.

### *2.3 ADKL Analysis Method*

ADKL analysis is an AMDAL analysis subdivision (Analysis of Environmental Impacts) which has an analytical method in the form of a comparative study between environmental health lab results data in the form of concentration levels (CO, CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub> and HC) [2] in the study object environment with two air quality standards issued by PPRI No.41 / 1999 and MENLH No.02 / 1988. Environmental health analysis is generated based on benchmark of the results of studies by Institut Pertanian Bogor about their analysis at vegetations and open land buffer at 0, 10, 30 m impact on decreasing CO concentration levels in Toll Cikampek Road up to 38,05% decreased [3]. Another application of environmental health preventive is by the result of studies about Green Roof and Vertical Garden by Peck & Associates about their analysis at Vertical Garden that is impact on decreasing Dust Particles (TSP) assuming the 2000 m<sup>2</sup> experiment area the vertical garden is able to absorb 4000 kg / day of dust particles [4].

### *2.4 Discounted Cashflow Method*

This analysis method is carried out by assessing the feasibility of investment in the development of apartments for millennials with several tools, namely [5]:

- (a) Internal Rate of Return (IRR) is a guideline value that is identical to how much interest rates the investment can provide compared to generally accepted bank interest rates. The feasibility criteria for this method are:
  - If the IRR value is > Bank deposit interest rates, then the investment is feasible.
  - If the IRR value is < Bank deposit interest rates, then the investment is not feasible.
  - If the IRR value is same with Bank deposit interest rates, then the company value remains.
- (b) Net Present Value (NPV) is the difference between expenses and income that has been discounted, or in other words is the estimated cash flow in the future that is discounted at this time. The feasibility criteria for this method are:
  - If the NPV value is > 0 (positive NPV), then the investment is feasible.
  - If the NPV value is < 0 (negative NPV), then the investment is not feasible.
  - If the NPV value is 0, then the value of the company remains
- (c) Profitability Index is the method of calculating the feasibility of a project by comparing the present value of cash flows with the value of the project investment. The feasibility criteria for this method are:
  - If the PI value is > 1, then the investment is feasible.
  - If the NPV value is < 1, then the investment is not feasible.

- If the NPV value is 1, then the value of the company remains

## 2.5 Research Assumption

This study was simulated using three alternatives programming unit based on market and three assumptions of take up rate that is:

- a Alternative 1 : Studio 54%, 1 Bedroom 21% and 2 Bedroom 25%
- b Alternative 2 : Studio 21%, 1 Bedroom 54% and 2 Bedroom 25%
- c Alternative 3 : Studio 10%, 1 Bedroom 10% and 2 Bedroom 80%
- d Assumption 1 : Optimist at 85% take up rate at 3 years constructions and marketing
- e Assumption 2 : Moderat at 78% take up rate at 3 years constructions and marketing
- f Assumption 3 : Pessimist at 69% take up rate at 3 years constructions and marketing

The selection of “alternative” programming units based on the average programming unit results from three competitor apartments in the study area. The selection of “assumptions” is based on three different criteria, The first assumption based on the results of market share analysis obtained, the second assumption is based on the average take up rate in the database radius area, and the third assumption based on the lowest take up rate in the database radius area.

**Table 1. Potential Development**

No	Competitor	Location			SA	P	FA	Score	Market Share	Take Up Rate	Price Per m <sup>2</sup> (x1000)/(Q2 2020)	Price Per m <sup>2</sup> (x1000)/(Q2 2021)
		L 60%	A 20%	T 20%								
1	Podomoro Golf View	3	3	2	2	1	1	1,94	23%	80%	Rp. 13.500	
2	LRT City Ciracas	2	1	3	2	2	1	1,9	23%	100%	Rp. 16.000	
3	LRT City Sentul	3	2	1	3	3	2	2,72	33%	90%	Rp. 17.695	
4	<b>Object</b>	3	3	3	1	1	3	1,8	22%	85%	Rp. 14.356	Rp. 16.650
<b>Information</b>												
	<b>L</b>	Location		<b>SA</b>	Condition of Surrounding Area							
	<b>A</b>	Accessibility		<b>P</b>	Proximity							
	<b>T</b>	Transportation		<b>FA</b>	Regional Function							

Due to the pandemic of Covid-19, sales begin in Q2 2021 (construction period 3 years up to Q3 2023) with initial sales lower than usual apartment sales, which is 20% and then increase per year for each assumption. Scheme payment units are with 20% Gradual Cash payment, 20% Down Payment and 80% Apartment Ownership Credit (KPA). Funding by the Bank (Bank Payment) is carried out at the 40% development progress of 40%, then 50% of financing during key handover and 10% of financing one month after the handover of KPA revenue.

**Table 2. Schedule Projection and Revenue**

Num		YEAR - 1			YEAR - 2			YEAR - 3					
		1	2	3	4	5	6	7	8	9	10	11	12
	Construction Progress			8%	12%	12%	12%	12%	12%	12%	12%	8%	
	Cummulative Progress			8%	20%	32%	44%	56%	68%	80%	92%	100%	
<b>Revenue</b>													
1	<b>Gradually Cash</b>												
2	<b>Down Payment</b>												
	DP in 1												
	DP in 2												
	DP in 3												
3	<b>Bank Payments</b>												
							40%					50%	10%



### 3. Results and discussion

#### 3.1 Result of Preferences Questionnaire

The results of questionnaire preferences by respondents, in general respondents chose vertical housing by paying attention to affordability housing, mass transportation accommodation, environmental health and proximity with infrastructure ( $H_0 > 0,05$  : Reject  $H_0$ ). While the vertical housing characteristic millennial concept tends not to be so important to included in the selection ( $H_0 \leq 0,05$  : Do Not Reject  $H_0$ ).

#### 3.2 Result of Perceptions Questionnaire

The results of questionnaire perceptions by respondents, in general respondents obtained that the development by providing Open Space (Lounge Activities, Co Working Spaces), Affordable Housing with a rate of 350-700 million, Green Concept and Integrity with Leisure and Business must be developed on the object of study ( $H_0 > 0,05$  : Reject  $H_0$ ). While the new concept of Co-Living (living together in one unit by rental bedroom) tends not to be included in the selection ( $H_0 \leq 0,05$  : Do Not Reject  $H_0$ ).

#### 3.3 Result of Environmental Health Analysis

The results of the environmental health analysis is that the Cement Plant did not have an impact on environmental pollution on the object of study with the following results (data are taken on february 2018 (Last Database DLH Kab. Bogor), for each result tested per one day):

**Table 3.** Result Test of ADKL Comparison

No	Parameter Analysis		Unit	Results	Quality Standards		Feasible
				UA-1 5	PPRI No.41/1999	MENLH No.02/1988	
4	Dust (TSP)	Particles	$\mu\text{g}/\text{Nm}^3$	227.34	230	260	V
5	Sulfur (SO <sub>2</sub> )	Dioxide	$\mu\text{g}/\text{Nm}^3$	<25.00	900	260	V
6	Karbondioxide (CO <sub>2</sub> )		Ppm	867.5	-		
7	Nitrogen (NO <sub>2</sub> )	Dioxide	$\mu\text{g}/\text{Nm}^3$	66.21	400	92.5	V
8	Hidrogen (H <sub>2</sub> S)	Sulfide	Ppm	0.003	0.02*	42	V
9	Amonia (NH <sub>3</sub> )		Ppm	0.521	2.0*	1360	V

This can be due to the elevation position of Plant 3 Cement Plant which differs 57 m from the study object and the dominant wind are to the north direction (not to the object of study). However, steps are needed to anticipate the danger of Dust Particles (TSPs) that have the potential to dust generation in a higher area like this Apartment Building plan project. Vertical Garden application in all apartment units optimally is obtained between 7500-10,000 m<sup>2</sup> and it will absorb dust particles of 15,000-20,000 kg / day or per unit plan with Vertical Garden (3.5 height x 1.75 width) able to absorb dust particles by 12.25 kg / day.

To prevent the effects of CO pollutants that are not contained in the Kab. DLH data Bogor, it can be planned to mitigate the environment with GREENSITE Concept [4] by planting trembesi trees and another air pollutant absorbing trees in 60% of the KDH area, the majority of which leads to the west of the apartment (Jagorawi Tol) which has 47.5 m buffer from pollutan source (Tol Jagorawi). The next mitigation addition is the vertical garden in the entire apartment unit. The total CO concentration that

can be reduced according to studies [3] is 59.22%. Total additional costs incurred for developing green sites are Rp. 700,000., Per tamarind tree seedlings plus Rp. 1,700,000., For vertical gardens per unit. the total cost required for Greensite is ± Rp. 17,000,000,000.

**Figure 1. Greensite Concept**



**3.4 Result of Investment Analysis**

The method of determining the feasibility of investing in a development plan is to look at the conditions of its cash flow and analyzed with Discounted Cashflow. The results of financial analysis can be seen in table 2.

**Table 4. Result of Discounted Cashflow**

	Alternative 1			Alternative 2			Alternative 3		
	Assumptions								
	1	2	3	1	2	3	1	2	3
<b>IRR</b>	29%	15%	-1%	31%	17%	0%	32%	19%	2%
<b>NPV</b>	Rp. 108 Billion	Rp. 49 Billion	Rp. -24 Billion	Rp. 115.6 Billion	Rp. 54 Billion	Rp. -17 Billion	Rp. 115.7 Billion	Rp. 62 Billion	Rp. -9 Billion
<b>PI</b>	1.21	1.11	0.99	1.23	1.12	1.0	1.23	1.14	1.0
<b>Payback</b>	3 yr	3 yr	-	3 yr	3 yr	-	3 yr	3 yr	-

The selling price per m<sup>2</sup> is Rp. 16,650,000 and Salable Area is 43,904 m<sup>2</sup>, from the table above it can be seen that the IRR under assumption 1 and assumption 2 is above of the Bank Deposit Interest Rate (12%). Neither NPV above 0 and PI above 1. Then, assuming 1 is optimistic with an 85% take-up rate and assuming 2 moderate assumptions at 78% take-up in all alternatives, it is investment feasible and profitable. For assumption 3, the pessimistic situation with a 69% take-up rate on all alternatives is in a financially unfeasible condition. The best alternative that can be chosen by the developer is **the third alternative** with the composition of programming units is studio 10%, 1 bedroom 10% and 2 bedroom 80% in the sense of selling more 2 bedroom units.

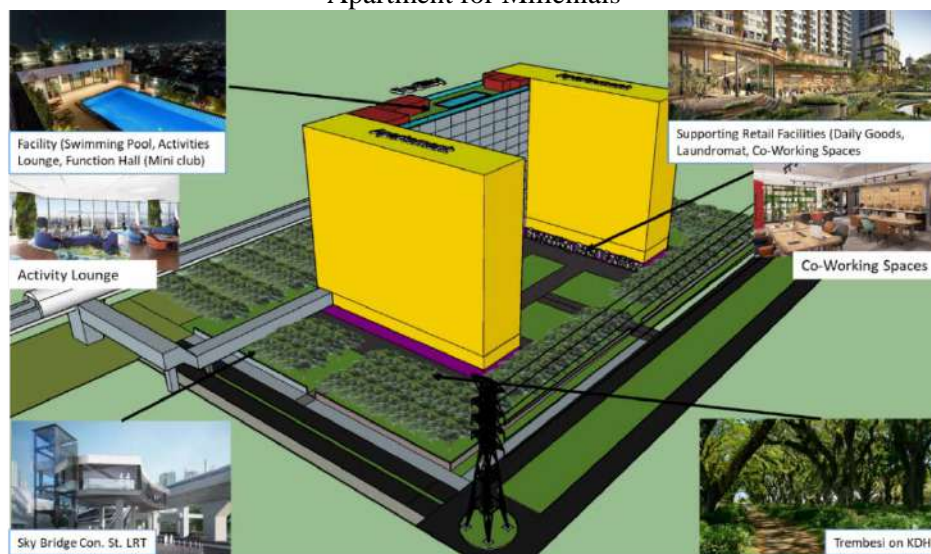
**4. Conclusion**

The conclusion of this feasibility study is a proposed recommendation for the concept of developing an apartment in accordance with millennial generation criteria. The development concept recommendation is an apartment with a middle class that has the concept of:

- a Social Community by providing open space functions such as function hall, co-working space in supporting retail functions, lounge activities that support activities to create an environmental community.
- b Green Concept by organizing Greensite to prevent the environmental impact of Cement Plant and traffic congestion Toll Jagorawi Road on the health of residents by planting Trembesi Trees on

- KDH 6400 m<sup>2</sup> and Vertical Gardens that cover each unit that will be lower the concentrate of CO up to 59.22%.
- c Affordability Housing as a concept of providing affordable housing at a price of Rp. 16,650,000 / m<sup>2</sup> with the type of studio (21 m<sup>2</sup>), 1 bedroom (31.5 m<sup>2</sup>) and 2 bedroom (42) at a price of 350 - 700 million rupiah. In this development in collaboration with banks that issue millennial loans and have a joint venture with the Developer, namely Mandiri (Mandiri Millennial) and BTN (BTN Gaess).
  - d Integrity with the planned LRT station by constructing a sky bridge from the apartment connecting to the Gunung LRT Station Putri II.

**Figure 2.** Development Concept of Gunung Putri Object Study Apartment for Millenials



The construction was carried out over a 3 years development period with the composition of the programming unit taken was Alternative 3 to be feasible at Investment Feasibility. Scheme payment units are with a 20% Gradual Cash payment, a 20% Down Payment and an 80% Apartment Ownership Credit (KPA). Funding by the Bank is carried out by construction progress. With all of the application of analysis results, the apartment development for millennial generation at the Gunung Putri LRT station in Kabupaten Bogor is feasible.

## 5. References

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