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SCIENCE, TECHNOLOGY AND INNOVATION FOR SUSTAINABLE WORLD

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In recent decades, the effects of globalization have created an extremely competitive atmosphere in all aspects of society. However, this flourishing competition must consider the harmony and balance between human needs and the environment to create a sustainable future. In this context, science and technology play important roles in enhancing the quality of researches and projects. Furthermore, innovative research combined with science and ecofriendly technology is essential for achieving sustainable development. However, sustainability and project development can be achieved through creating alternative designs and stimulating innovation. Furthermore, innovation in terms of adding value to technology development processes can play a significant role in technological contributions and outcomes.

At the close of this year, it is our utmost pleasure to welcome you to a special edition of the International Journal of Technology (IJTech) that presents the best papers from the 15th International Conference on Quality in Research (QiR) 2017, which was held in Nusa Dua, Bali, Indonesia. The Faculty of Engineering, Universitas Indonesia organizes this biennial event, and this year it did so in collaboration with the Universitas Udayana and Politeknik Negeri Bali. QiR 2017 was held in conjunction with the International Conference on Saving Energy in Refrigeration and Air Conditioning (ICSERA), the 6th International Conference on Advanced Logistics and Transport (ICALT), the 2nd International Symposium on Biomedical Engineering (ISBE), and the 3rd Biannual Meeting on Bioprocess Engineering. QiR 2017 received 977 submissions from 28 countries worldwide, and 600 participants from universities, research institutions, and industries attended the event. There were seven symposia in QiR 2017, and they included many research themes, such as current issues in engineering research based on lab works, architecture, community engagement, and industrial applications. From approximately 500 presented papers, 60 papers were selected and divided into the three books of this special edition.

In this first book, we are pleased to present 21 papers dedicated to product/project design and technology development. The readers will find various discussions regarding designs and modeling being implemented to create more effective and improved technologies in various engineering contexts.

The first paper, written by S. Pramono, W.A. Prakoso, P. Cummins, A. Rahayu, A. Rudyanto, F. Syukur, and Sofian, investigated subsurface characteristics of the Palu area by considering the value of V_{s30} (top 30 m shear-wave velocity). The authors argue there is a good correlation between V_{s30} and the dominant period measurement, and they found that, in general, Palu City is predominantly a class-D site, while the northwest part of the Palu area is a class-C site.

The second paper, written by W.A. Prakoso, A. Rahayu, I. A. Sadisun, A.S. Muntohar, M. Muzli, and A. Rudyanto, investigates soil profiles based on a multichannel analysis of the surface wave (MASW) technique. The authors argue that the MASW method provides more reliable shear-wave velocity profiles, i.e., from 0 to 30 meters below the ground surface.

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The third paper, written by L.E. Hutabarat and T. Ilyas, determines a benchmark and performs an analysis of sustainable counter measures for land subsidence induced by groundwater extraction in the urban areas of Jakarta city using a continuous monitoring system and an integrated data management system. The authors argue that land subsidence was found to have a strong association with groundwater extraction.

The fourth paper, written by E. Bahsan, G.S.B. Andari, S. Pramiarsih, and S.A. Latief, investigates the geotechnical characteristics of solid waste materials from a typical urban landfill in Indonesia. The authors argue that the cohesion value of the waste material aligns with the initial compression: higher compression results in higher cohesion, while the contrary applies to the friction angle. Furthermore, the waste materials' bearing capacity (also the strength characteristics) shows a linear increase in line with the depth.

The fifth paper, written by D.R. Pujiastuti and N. Suwartha, investigates the concentration changes in ammonia and nitrate in shrimp farm wastewater by applying biofloc technology combined with Effective Microorganisms 4 (EM4). The authors argue that this innovative combination is successful in removing up to 88.9% of the ammonia and nitrate waste from shrimp farm wastewater.

The sixth paper, written by C.R. Priadi, E. Suleeman, L. Darmajanti, S. Novriaty, N. Suwartha, R. Resnawati, R. Handayani, G.L. Putri, E. Felaza, and T. Tjahjono, investigates the enablers of, barriers to, and opportunities for early adoption of water recycling in the business sector of the Greater Jakarta region of Indonesia, and it highlights the possibilities of water recycling's wider implementation to reduce water stress. The authors argue that recycled water should be mostly used for purposes with minimal direct contact to minimize the negative responses from the public.

The seventh paper, written by J. Sjah and E. Vincens, presents a set of numerical simulations of different 2D boundary-value problems to validate a "smoothed-particle hydrodynamics"-"arbitrary Lagrangian-Eulerian" (SPH-ALE) code. The authors argue that the deviations found were of the same order of magnitude as for the circular cylinder, which validated the numerical code.

The eighth paper, written by H. Purnomo, R. Nursani, S. Mentari, S.A. Rahim, and E. Tjahjono, discusses the behavior of a full-scale shear key connection without epoxy joining two concrete blocks, representing segmental precast concrete, at which two external forces load the blocks. The authors argue that the numerical and experimental results produce an almost similar relation of shear stress at the male shear key and the vertical displacements of the upper block relative to the lower concrete block.

The ninth paper, written by I. Katili, I.J. Maknun, E. Tjahjono, and I. Alisjahbana, presents an application of the DKMQ24 element for error estimation using error estimator Z2 and various recovery methods, such as Averaging (AVR), Projection (PROJ), and Superconvergent Patch Recovery (SPR). The authors argue that the AVR and SPR methods gave better results than the PROJ method.

The tenth paper, written by M. Hartono, A. Santoso, and D.N. Prayogo, proposes an integrated model of Kansei, Kano, and QFD to generate more innovative ideas for improvements regarding customer emotional satisfaction and customer delight. A case study in the supporting logistics services has been chosen to validate the proposed model, which helps the company in capturing, measuring, and analyzing the customers' emotional needs, with respect to service attributes.

The eleventh paper, written by B. N. Moch, Komarudin, and M. S. Susilo, examines the use of a Neural Network (NN) to predict fixation points, which are the stopping locations of eye movements when viewing a picture. The results show that NN produces a MAPE (Mean Absolute

Percent Error) around 13-15% and an MSE (Mean Squared Error) of 0.9-1.1%, and it can be used when making decisions for further use, such as in marketing.

The twelfth paper, written by M.A. Puspasari, H. Iridiastadi, I.Z. Sutalaksana, and A. Sjafruddin, evaluates the driving duration effect toward Electroencephalogram (EEG) fluctuation and determines the best EEG parameter related to fatigue. This study has practical implications for transport safety. Using three hours of driving in a medium fidelity driving simulator, the results show that an EEG signal, particularly RPR theta, can be used as a practical parameter for detecting fatigue when driving.

The thirteenth paper, written by B.M. Iqbal, A.O. Moeis, and R. Krissalam, examines the actual design of the Tactical Commander Console (TACCO) to further determine the most ergonomic design configuration. The TACCO design was reviewed in terms of the panel's distance and tilt angle, as well as the chair's height. The results show that the most ergonomic TACCO design has a panel distance of 10 cm, a tilt angle of 60˚, and a chair height of 29.5 cm.

The fourteenth paper, written by B. Prastyatama and A. Maurina, presents an argument that material studies could establish a connection between the intangible and the tangible, between dwelling and building. Drawing on Heidegger's proposition on dwelling, the authors propose a set of criteria to allow more meaningful material studies of the built environment.

The fifteenth paper, written by I. Juwono, discusses the role of natural materials in traditional architecture, addressing the relationship between the preservation of the environment and the use of natural building materials in the traditional houses in Flores, Nusa Tenggara Timur.

The sixteenth paper, written by E. Too, T. Le, and W.Y. Yap, examines the role of project governance in the new low-cost carrier hub known as Kuala Lumpur International Airport 2 (KLIA2). The authors highlight the importance of an effective project governance framework with clear decision-making responsibilities to assure successful management of the project's scope.

The seventeenth paper, written by Y. Latief, M.A. Berawi, A.B. Koesalamwardi, L.S. Riantini, and J.S. Petroceany, identifies the design parameters of the near Zero Energy House (nZEH) and its best practices in tropical climates, including Indonesia. The authors argue that the ideal nZEH design parameters in tropical areas include a passive design, fenestration, indoor lighting arrangements, and the use of photovoltaic panels (PV).

The eighteenth paper, written by M.A. Berawi, P. Miraj, A.R.B. Berawi, and R. Agdhitya, considers development prospects and regional characteristics, as well as added value, to increase competitiveness in terms of infrastructure, technological readiness, and urban development. The authors argue that developing the area around the new city of Walini has the potential to improve regional competitiveness by attracting new business and generating more revenues from the railway project.

The nineteenth paper, written by A. Kusuma, N. Tinumbia, and P. L. Bakdirespati, examines the travel characteristics of potential High-Speed Train (HST) passengers, which is critical in predicting HST demand. The authors argue that the passenger traffic vehicle surrenders the benefit of choosing HST in comparison with the existing transport modes and that passengers traveling from Jakarta could be more easily shifted to the HST than could passengers traveling from Bandung.

The twentieth paper, written by A. Purba, F. Nakamura, D. Herianto, I.W. Diana, M. Jafri, and Ch. Niken, identifies the main aspects of transit system service quality within a tourism-education city and a business city. The authors argue that the users' level of dependency on the mode.

The twenty-first and final paper, written by S.M. Aryani, S. Sasongko, and I.E.S. Wahyuningsih, discusses the flexibility of space as another aspect of sustainability in public housing units. The authors highlight the importance of understanding the transformation of space in public housing units during occupation.

We hope that this special edition of the IJTech conveys some new insights into how we conduct our research. We are pleased to accept and respond to any comments or questions you may have regarding the direction and content of IJTech, and we invite you to join us in this venture by submitting your work for consideration.

With warmest regards from Jakarta,

Dr. Nyoman Suwartha
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