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VALUE-BASED INNOVATION: KNOWLEDGE AND TECHNOLOGY TRANSFER IN THE TRIPLE HELIX MODEL

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In light of globalization, innovation has been determined as a strategy to increase competitive advantage, and, therefore, nurturing innovation through improved policies and practices has become a priority in both the public and private sectors. Globalization has boosted the need for the triple helix of university–industry–government collaboration, which encourages the transfer of knowledge and technology to improve project development and the quality of products. The concept of the triple helix relationship encourages potential cooperation for innovation and thus stimulates economic growth by generating productivity and strengthening competitive advantages.

Innovation in the Triple Helix Model

The triple helix model provides various alternatives to explore complex innovation and create added value for products and projects. From a triple helix systems perspective, the consolidation of multiple perspectives used to generate new combinations of knowledge and technology in solving problems and improving end results requires the dynamic interaction between triple helix actors in the context of mutual cooperation and consensus. Innovation in the triple helix model is embedded in an interactive system of partnerships, the role of governments in shaping innovation policies (politics), and the relation between universities (education) and the industry (economy) in producing value-added products through advanced knowledge and technologies that suit the public or market needs. Furthermore, one of the key strategies in a successful triple helix cooperation is managing the cross-cultural issues between stakeholders because these might affect the quality of the collaboration and the effectiveness of the transformational learning process for successful knowledge and technology transfer.

Knowledge and technology transfer is the process of transferring skills, methods, and facilities among actors and institutions to ensure that scientific and technological developments are accessible for further development into new processes or end results. The transfer of individual and organizational knowledge, such as best practices, then becomes a means to search for sustainable technological solutions in design and product and project development. Various factors need to be clearly defined, including conceptions of technology utilization and collaboration, process activities and capacity transfer, and dissemination and communication models, to achieve efficient and effective knowledge and technology transfer. It is a collaborative and context-specific process based on mutual understanding, so the intended collaboration in the triple helix model provides links to tie together all aspects of technology, namely, knowledge, process, and product results.

This season, we are pleased to present 19 selected papers dedicated to producing improved design and discussing various solutions to improve process engineering and technology development.

The first paper, written by M.T. Ansari, N. Armaghan, and J. Ghasemi, highlights the barriers and solutions to research commercialization in Iranian agriculture.

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The authors argue that the main barriers to commercialization are inappropriate perspectives and policy making and financial investment barriers, whereas the main solutions are related to planning, legislation, policy making, needs assessment, and prioritization. Furthermore, the authors suggest that agricultural development requires a market-oriented strategy capable of stimulating rapid technological change in the agricultural sector and related industries for commercialization

The second paper, written by S. Nwanya, C. Sam-Amobi, and V. Ekechukwu, investigates the energy indices in Nigerian hospitals. Systematic field surveys followed by in-depth statistical analysis are conducted, and the results show that an average amount of energy is used in Nigerian hospitals. Furthermore, the authors argue that the lighting function as an area for energy optimization can be reduced by a significant amount through the implementation of cost-efficient measures, such as the photo voltaic system.

The third paper, written by R. Nazir, M. Nurdin, and E. Fitrianto, examines the effect of multiple renewable distributed generation penetration systems on improving the performance of the B3 feeder typical distribution system. The results showed that integrating three renewable distributed generation units increases the minimum voltage of the main line, reduces active power loss, and diminishes reactive power loss.

The fourth paper, written by M.F. Muthohar, I.G.D. Nugraha, and D. Choi, explores the utilization of a motion sensor for continuous motion and location sampling in a mobile sensing application. The authors argue that combining the adaptive duty cycle with the motion sensor provides improved results.

The fifth paper, written by V.R. Sarobin and L.A. Thomas, examines an improved leach algorithm for the energy-efficient clustering of a wireless sensor network. During the cluster head selection phase, cluster heads are chosen with both the residual energy and the distance of the node with respect to the sink considered. The authors argue that the proposed algorithm outperforms the traditional LEACH protocol in prolonging network lifetime.

The sixth paper, written by V. Bathia, N. Pandey and R. Sridhar, proposes the design of a high-speed nonlinear feedback-based current comparator. The authors argue that the 3-bit current mode flash ADC does not exhibit missing codes, and it has a differential non-linearity of −0.25 least significant bit (LSB) and an integral non-linearity of −0.19 LSB.

The seventh paper, written by A.C. Nusantara, E. Purwanti, and S. Soelistiono, presents a designed system to classify digital mammograms for breast cancer detection with the use of k-Nearest Neighbors method. The authors argue that optimal accuracy is obtained when wavelet decomposition level 3 is used with the feature combination of mean and standard deviation.

The eighth paper, written by H. Hugeng and R. Kurniawan, proposes the development of a portable early detection system for cardiac disorders. The authors argue that the system detects the time intervals of various segments in electrocardiography signal to determine whether the patient has cardiac disorders. The system can also be used to detect heart rhythm disorders.

The ninth paper, written by A. Mishra and V.N.K Gundavarapu, proposes an alternative approach to finding the optimal location for the interline power flow controller, which helps reduce system loss and power flow in heavily loaded lines and improves system stability. The authors argue that the proposed method further reduces congestion in the system by about 15%.

The tenth paper, written by M. Hartono, discusses an integration of Kansei Engineering, the Kano model, and the theory of inventive problem solving to define the significant roles of both emotional and cognitive aspects in achieving excellence service. The author argues that by

incorporating cultural differences, the model can be useful to service developers who are formulating appropriate culture-based service strategies.

The eleventh paper, written by P. Hendratmoko, Guritnaningsih, and T. Tjahjono, presents an interaction analysis between preferences and intention to determine the behavior of vehicle maintenance as a basis for road safety assessment. Using structural equation modeling analysis, the authors argue that the respondents' intentions are more influential on behavior than willingness to pay is.

The twelfth paper, written by B.H. Trisasongko, D.R. Panuju, Harimurti, A.F. Ramly, and H. Subroto, assesses agriculture vulnerability to drought by using a GIS technology-based approach. The authors argue that a variation in agriculture vulnerability exists, and the further mitigation of these risks is required to avoid negative results.

The thirteenth paper, written by R. Kusumawardani, K.B. Suryolelono, A. Rifai, and B. Suhendro, presents a series of cyclic triaxial tests at a low frequency on unsaturated clean sand to investigate the influence of the degree of saturation on dynamic response. The results indicate that the application of cyclic loading at a low frequency continuously triggers a decrease in soil resistance.

The fourteenth paper, written by A.B. Sulong, A. Arifin and Z. Harun, proposes the design and development of a prototype of a knee surgery cutting jig, the jig holder, and the jig injection mold by rapid prototyping. The authors argue that the initial performance testing for the jig-and-holder assembly showed acceptable results in terms of accuracy, consistency, cost, and ergonomics.

The fifteenth paper, written by M. Mohebbi and M. Hashemi, discusses the use of the active force control method to reduce the vibrations caused by an unbalanced rotary engine. Basing on the obtained simulation results, the authors argue that when the AFC loop is added to the *proportional–integral–derivative* controller, the vibrations are reduced to a noticeable degree with high efficiency.

The sixteenth paper, written by F. Behzad, H. Bahmanyar, S.M.A. Mousavian, H. Molavi, and F. Fogh, examines an experimental approach for local static hold-up in a rotary sieved disc contactor for a butyl acetate–water system. The authors argue that an increase in mother drop size causes the growth of static holdup, whereas an increase in the rotating speed decreases the amount of static holdup.

The seventeenth paper, written by Y. Yulizar, T. Utari, and D.P. Ananda, evaluates wax aggregation inhibition in crude oil by oxirane ester copolymer. The authors argue that the interaction mechanism inhibits wax aggregate formation and decreases the pour point, viscosity, and temperature value of crude oil.

The eighteenth paper, written by D. Ismail, investigates the utilization of chlorella vulgaris to fixate a high concentration of carbon dioxide in a compost-based medium. The author establishes the potential of chlorella vulgaris in reducing high concentrations of CO_2, which is beneficial to biomass, lipid, biodiesel, and food supplement production.

The nineteenth paper, written by R.R. Maulani and A. Hidayat, investigates the changes in the functional properties of modified arrowroot starch in various acidic pH mediums. The authors argue that the syneresis value of modified arrowroot starch can be achieved by using a combination of propylene oxide and a ratio of sodium tri-meta phosphate with sodium tri-poly phosphate.

I hope that this special edition of IJTech conveys some new insights into the way we conduct our research. Your comments and inquiries on the direction and content of IJTech are welcome. I invite you to join us in this venture by sending your work for consideration.

With warmest regards from Jakarta,

Dr. Mohammed Ali Berawi
Editor in Chief