ACCELERATING TECHNOLOGY DEVELOPMENT: ENGAGING STAKEHOLDERS AND INTERNATIONAL NETWORKING

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Innovation has a central role in technology development. It is produced everywhere and enriched by local wisdom for problem solving in particular regions to further increase human wellbeing. Technology development thus becomes a dynamic system of relationships among various stakeholders, and it requires a collaborative and mutual partnership.

Technology partnerships become a network model that is formed by stakeholders who share linked knowledge, activities, and resources, which lead to future strategic options and alternative product solutions that are efficient, effective, and sustainable. Technology results from inventors and researchers in various laboratories and companies translating ideas into prototypes, which can then serve various needs and purposes through transformation into value added products and/or projects. Technology transfer is conducted firstly via provider collaboration and secondly to customers. Both the governments and private investors that provide financial support to fund technology development and transfer make significant contributions by supporting development strategies and policies as well as creating sufficient market incentives.

Dynamic interactions and the establishment of strong networks between stakeholders allow for the production and examination of new technology, including scientific cooperation and capacity-building, and accelerate transfer and dissemination of relevant technologies. A strong network creates access to the global market; therefore, multinational cooperation is critical to technological competitiveness. Global networks maximize contributions to science, technology, and innovation as well as spread their knowledge to impact worldwide sustainable development. The need to access new markets by utilizing local wisdom is viewed as being at the forefront of successful technology transfer because adaptation to local conditions can minimize unwanted outcomes.

Furthermore, collaborative relationships provide opportunities for flexibility and speedy access to new capabilities by accruing the benefits of the resources and skills of other parties. Mutual commitment in relationships leads to increased levels of both productivity and competitiveness by connecting improvement processes and thus providing access to more resources and markets.

Support for International Academic and Professional Communities

IJTech receives a large number of publication requests from many international conference organizers. In this year alone, proposals from 27 international conferences that were held in various countries were submitted, which allowed for selection of the best papers from the conferences covered by *IJTech*. To consider these requests whilst maintaining strict journal quality, the IJTech editorial board has agreed to increase the current publication numbers from four times/year to eight times/year, with four special edition slots added to support international academic and professional conferences.

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In this special edition, *IJTech*'s editors-in-charge in the respective fields of study have selected 18 papers from the 6th KKU International Engineering Conference 2016 in Thailand, which discussed engineering and technology applications for better living.

Paper one, written by M. Boonpichetyong, T. Pannachet, and S. Pinitkarnwatkul, investigates the behavior of concrete columns that are partially confined by metal sheet strips under uniaxial compression using nonlinear finite elements. The authors argue that confining the concrete columns with metal sheet strips can enhance the axial compression capacity, which depends on the number of applied layers—the more layers, the greater the strength. This discrete system could be a good alternative for axial strengthening of concrete columns.

Paper two, written by J. Kumphong, T. Satiennam, and W. Satiennam, examines the correlation between traffic accident fatalities and the enforcement of speed limits with the gross national incomes of Thailand and its cross-border countries. The authors argue that traffic accident fatalities are negatively correlated with the performance of speed limit enforcement; hence, countries with higher gross national income levels have more efficient speed limit enforcement, which leads to lower rates of traffic accident fatalities.

Paper three, written by K. Kuntiyawichai, Q.V. Dau, W. Sri-Amporn, and F.X. Suryadi, investigates the spatial variations between different levels of risk and the extent of flood damage using the hydrological model HEC–HMS and the hydrodynamic model HEC–RAS in association with the ArcGIS. The authors argue that both models are suitable for the river basin because of their relatively high values in both statistical indices (i.e., ENS varied between 0.75–0.87 and R^2 ranged between 0.81–0.92). In addition, flood zone mapping was prepared to cope with the flood problems based on the FHR analysis.

Paper four, written by T. Piman, C. Pawattana, A. Vansarochana, A. Aekakkararungroj, and R. Hormwichian, investigates the changes in rainfall characteristics in terms of trends, variability, spatial and temporal distributions, and extremes in the Huai Luang Watershed. The authors found an increasing trend during the 32-year period from 1982–2013. The annual rainfall during the second period (1998–2013) was 20% higher than the first period (1982–1997). The magnitude of extreme daily rainfall (20-year return period) in the second period was approximately 19–45% higher than the first period. The annual rainfall is predicted to increase by 16.8% by 2020, and the variation has doubled.

Paper five, written by K. Thawongklang and L. Tanwanichkul, proposes a model for production planning and management of daily scheduling and dispatching of ready-mixed concrete trucks to assist in making decisions on advanced planning to increase effectiveness, precision, and flexibility of the delivery management system. The authors argue that, by improving efficiency, optimizing delivery times, and reducing the cost of waiting times at various sites, the production and dispatching proposed in the Ready-mixed Concrete Model (PDRMC) could cut operating costs and increase the company's revenue.

Paper six, written by P. Foytong, M. Boonpichetvong, N. Areemit, and J. Teerawong, examines the compressive stress of brick and masonry prisms per ASTM C1314–14 standards as the basic parameters for evaluating lateral resistance of masonry infill walls and compares the compressive strength between various brick types. The authors found that the compressive stresses of all clay brick types are higher than either hollow brick or lightweight block, and the maximum stress-strain of masonry prisms made of clay brick are larger than those made of either hollow brick or lightweight block.

Paper seven, written by P. Tankasem, T. Satiennam, and W. Satiennam, examines the psychological factors that influence car- and motorcycle-riders' speeding intentions (IN) by using the Theory of Planned Behavior (TPB). The authors found that the most significant

psychological factor for car drivers was determined by attitude (AT), while the speeding intention of motorcycle riders was attributed to perceived behavioral control (PBC).

Paper eight, written by P. Tankasem, T. Satiennam, and W. Satiennam, investigates the psychological factors that influence drivers' urban speeding behaviors in three cities in Southeast Asia and focuses on developing countries using the Theory of Planned Behavior (TPB) and the Structural Equation Models (SEM). The authors found that the most significant psychological factor for Khon Kaen drivers was determined by attitude (AT), while the speeding intentions of Vientiane drivers and Phnom Penh drivers were determined by perceived behavioral control (PBC).

Paper nine, written by A. Janpila, P. Foytong, A. Ruangrassamee, and N. Areemit, proposes a deterministic seismic hazard map, which would evaluate nineteen active faults that affect Thailand by using a ground motion prediction equation (GMPE). The authors found that the northern and western parts of Thailand are high seismic hazard regions and thus have the greatest possibility of earthquakes of a maximum magnitude. The seismic hazard represented by Peak Ground Acceleration (PGA) in several parts of Thailand ranges from 0.25 g–0.60 g.

Paper ten, written by K. Srinavin and P. Tunming, examines the effect of foam beads and kaolin as additional substrates to enhance both the physical and thermal properties of concrete block. The authors argue that, because of its thermal behavior, concrete block with kaolin is a suitable energy-saving building material for hot and humid climates. They found that, by adding foam beads and kaolin, both the water absorption and thermal conductivity coefficient of concrete block increased; however, compressive strength decreased. Testing showed that concrete blocks with kaolin took the longest time to heat and the shortest time to cool.

Paper eleven, written by D. Tanangteerapong, P. Prasathinpimai, W. Suebthamma, and K. Kamwilaisak, investigates the potential of *Rhodotorula graminis* TISTR 5124 for synthesis of polyhydroxyalkanoate (PHA), with the limitation of phosphorous and nitrogen as sources. The maximum growth rate of this yeast strain was a P-limited condition at 81 h, whereby the cell number of 3.1×10^9 cells/mL was obtained and corresponded to the optical density (OD) of 0.95, which was measured at a wavelength of 600 nm. The maximum PHA content of ~54.4% was found in the P-limited condition, which corresponded to a PHA yield of 65.1 (g/g-total sugar consumed), in which the yeast consumed the least glucose (3.2 g/L) but grew the most rapidly.

Paper twelve, written by P. Sanchumpu, K. Laloon, S. Champana, and C. Junsiri, discusses the importance of rotational speed in determining the suitable sieve size for reducing the size of eucalyptus bark and analyzing energy usage in the size reduction process by using a hammer mill. The results of the study show that a 5-mm sieve size at a 900-rpm sieve speed provides the optimal operating conditions in terms of capacity and specific energy consumption.

Paper thirteen, written by W. Lasoi and S. Pornpromlikit, proposes a broadcast-based skew correction technique to deal with performance indicators. Various utilizations of wireless sensor networks (WSN) have raised research concerns regarding how to improve both the accuracy and lifetime of any time synchronization protocol that only corrects time offsets among sensor nodes. Time synchronization is a vital process in WSN, where energy sources are highly limited.

Paper fourteen, written by C. Noyunsan, T. Katanyukul, Y. Wu, and K.R. Saikaew, proposes a content-based filter system on Facebook by using a corpus of non-newsworthy posts, TF-IDF, and cosine similarity. The authors argue that both the system's design and development can be used to analyze data of typical social network applications.

Paper fifteen, written by T. Upachaban, K. Khongsatit, and T. Radpukdee, develops a mathematical model for a closed poultry house and provides a simulation. The simulation result was compared to the data collected for model verification and control gains estimation. In

comparison to the real plant data, their model provides an acceptable temperature prediction result, especially for the rear part of the house, which is the most critical area. The relative humidity prediction result shows that the model offers good performance only at the front and middle parts of the house.

Paper sixteen, written by T. Howongsakun, S. Theerakulpisut, P. Sujumnongtokul, and P. Palasan, studies the effects of highly moist inlet air conditions, such as temperature, relative humidity, and frontal air velocity, on the value of the Lewis number (Le) in the cooling and dehumidifying processes of air. A finned tube-cooling coil was tested under ranges of temperature, relative humidity, and frontal velocity. They found that the Lewis number (Le) varied within the range of 0.92–1.62, and the increase in inlet air relative humidity tended to decrease the Lewis number (Le).

Paper seventeen, written by N. Khongthon, C. Junsiri, K. Laloon, S. Champana, and S. Sudajan, studies the effect of mixing ratio and pelleting speed on physical and mechanical properties of biomass pellets from sugarcane trash. The physical and mechanical properties of sugarcane trash pellets were necessary for the design considerations relating to storage, handling, and processing equipment. Their results show that mixing ratios and pelleting speeds significantly affect bulk density, true density, porosity, durability, and compressive strength. They suggest that other engineering properties should be measured or calculated to provide more comprehensive information on design.

Paper eighteen, written by E.P. Putri, D. Chetchotsak, P. Ruangchoenghum, M. A. Jani, and R. Hastijanti, investigates the productivity changes of large and medium scale manufacturing industry (LMSMI) clusters by using the DEA-based Malmquist Productivity Index. The input and output data of LMSMI are: (i) input cost data consists of raw and supported materials, fuel, electricity and gas, and rent of buildings, machinery, and equipment; (ii) output data consists of goods produced, other receipts from the service of non-manufacturing, and the value of semi-finished goods stock. This study indicates that 50% of the LMSMI clusters in the East Java Province are in the category of improved productivity, while the rest are declining in productivity.

We hope that this special edition of *IJTech* conveys some new insights into the way we conduct our research. We are pleased to accept and respond to any comments and enquiries regarding the direction and content of *IJTech*.

With warmest regards from Jakarta,

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