THE ROLE OF TECHNOLOGY IN ACHIEVING SUSTAINABLE DEVELOPMENT GOALS

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The Sustainable Development Goals (SDGs) established by the United Nations (2015) consist of 17 global goals with 169 targets. These include actions to end poverty, improve health and education, and promote prosperity and well-being by considering environmental sustainability. In fact, the SDGs cover multiple dimensions of development, including social welfare (e.g., education, health, poverty), economic growth (e.g., production and employment, clean energy, industries and infrastructure), environmental sustainability (e.g., ecosystem, water and sanitation, climate change), and effective regulatory rules and governance (e.g., accountability, justice).

The 2030 Agenda principle of a "no one will be left behind" philosophy requires global partnership and participation in an integration of environmental, social, economic, and governance dimensions in the process of development.

Technology development plays a significant role in achieving SDG targets by improving the efficiency and effectiveness of new and more sustainable ways of development. The creation of new technologies that foster research and stimulate innovation is thus required. These processes can be boosted by strengthened knowledge-sharing and collaboration amongst stakeholders in both national and international contexts.

Technology Development: Policy and Strategy

In order to achieve the SDG goals, technological solutions must be developed and disseminated widely across the globe. Developing technology and creating innovation as well as producing breakthrough solutions will be critical for delivering all SDG targets, from poverty eradication to food security and climate change. Investments are a vital instrument by which to foster appropriate technology development.

Strong collaboration in private and public partnerships will accelerate appropriate and sustainable technology development, scale-up, and transfer in order to generate more social benefits and reduce environmental impacts alongside economic returns. The development of frugal to high-tech innovation is viewed as the application of better solutions that produce effective products, processes, and services that meet new requirements and needs.

Achieving sustainable economic growth will require changes in business processes. Industries need to shift to more energy and resource efficiency with minimum waste. Technological development in utilizing renewable energy resources, building urban water systems and sustainable public infrastructure, increasing food production, and producing environmentally friendly materials and products are amongst the pathways by which technology will significantly contribute to achieve SDG targets.

Information and communication technology (ICT) can also be used to enhance productivity, increase quality education, and ensure healthy lives for everyone. ICT is driving today's innovation, efficiency, and effectiveness across all sectors and resources, where everyone has the

potential to access and share information and then utilize it to create new opportunities. It is changing the way businesses are managed. ICT can also be used to assist government in delivering better public services as well as creating smart, resilient cities. ICT has sharpened the way we work and live as well as the outlook on the development of urban areas. The fourth industrial revolution has made possible the transformation of entire systems of production, management, and governance into more effective and efficient systems in connected societies.

In this edition, we are pleased to present twenty selected papers dedicated to various studies in design and engineering areas as a way to foster sustainable technology development in improving product/project/service performance and end results.

The first paper, written by M. Bashir, S.A. Khan, Q. Azam, and A.A. Janekar, presents the contour plots of pressure, temperature, density, and mach number that unravel the positions of flow separations in an oscillating wedge model. The authors argue that an increase in the angle of incidence causes a continuous shift of the center of pressure toward the aft position of the wedge; the pressure distribution is significantly large at the back of the wedge and increases abruptly as the Mach number increases to 20.

The next paper, written by A. Shakoori, A.V. Betin, D.A. Betin, and M. Mortazavi proposes a method for tuning the moments of inertia of a free-flying dynamically similar/scaled model of aircraft. The authors argue that the ballast weight was successfully reduced from 8.66 kg to 4.86 kg using the proposed technique, and the inertia characteristics' non-similarity was minimized.

The third paper, written by D. Paroka, A.H. Muhammad, and S. Asri, investigates the effect of a turning maneuver of a ro-ro ferry under the combined influence of constant wind and regular waves, using the MMG model. The authors argue that the effect of wavelength on the sway force and yaw moment is more significant compared with its effect on surge force.

The fourth paper, written by M. Zulkarnain, M.A. Fadzil, and R. Sharudin, proposes algorithm pore distribution models for porous material for an insulator application by establishing the effects of pore shape, content, and size, which act as expressions of the nature of porous material. The authors argue that a significant improvement in the optimization of the insulator model was shown by a synergistic effect on decreasing thermal conductivity in increasing the content of the pores.

The fifth paper, written by P. Hiremath, M. Shettar, M.C. Gowrishankar, V.R. Chauhan, and R. Nikhil investigates the mechanical properties of glass fiber – chicken feather hybrid composite. The authors argue that the 10 wt. % chicken feather-filled hybrid composites indicated the maximum tensile strength (193 MPa), flexural strength (148 MPa) and impact strength (3.65 Joules), and therefore these composites can be used in domestic, automobile and structural applications which carry nominal loads.

The next paper, written by P.N.L. Pavani, R.P. Rao, and C.L.V.R.S.V. Prasad, examines the tribological performance of a blended (palm and mahua) biolubricant, using a Taguchi design for the experiments. The authors argue that abrasive and adhesive wear were the main wear mechanisms that occurred, where the total wear of the test specimens under all machining conditions for a 90% mahua and 10% palm blended oil combination was found to be minimum.

The seventh paper, written by N.J. Jonatan, A. Ekayuliana, I.M.K. Dhiputra, and Y.S. Nugroho, analyzes the heat release rate from the combustion process of bioethanol from sago waste to determine the viability and feasibility of low-concentration bioethanol as an alternative fuel. The authors argue that bioethanol made from sago waste is suitable as a clean alternative fuel for household applications in rural areas.

The eighth paper, written by Y. Benbouras, A. Maziri, E. Mallil, and J. Echaabil, presents the linear and nonlinear behavior of a symmetric laminated composite simulation under three-point bending tests. The authors argue that when the deflection of the specimens is less than 2.5 times the thickness, the difference between the experimental and analytical curves is about 1% for the average global stress method and about 7.5% for the apparent bending modulus method.

The next paper, written by A. Cifriadi, M. Chalid, and S. Puspitasari, examines noncatalytic diimide transfer hydrogenation of NR latex concentrated at various proportions of hydrazine hydrate/hydrogen peroxide. The authors argue that a higher concentration of hydrogen peroxide triggers a crosslink reaction of the non-rubber constituent and depolymerization of the HNR molecular chains.

The tenth paper, written by A. Manaf, M.A.E. Hafizah, Belyamin, B. Nainggolan, and M. Manawan, examines the effect of ion substitution on the microstructure and magnetic and microwave absorption characteristics of Ti_2^+-Mn_4^+ substituted $BaFe_{12-2x}Ti_xMn_xO_{19}$. The authors argue that the ionic substitution affected the magnetic properties, in which coercivity decreased proportionally with an increase of the x value.

The eleventh paper, written by J. James, S.V. Lakshmi, and P.K. Pandian, proposes a synthetic fill material from industrial waste materials as a replacement for natural soil. Biosolids and steel slag were blended to proportion the synthetic fill material. The authors argue that the index properties of the blends were better than those of biosolids, where 25% to 40% steel slag blending produced the maximum strength and bearing.

The next paper, written by R. Haribowo, E. Yuliani, and A.G. Prasetyo, proposes a seawater distiller that can be used to purify water by using electrical energy to power the heating elements used in the condensation phase of distillation. The authors argue that there was an effective water quality improvement of 9.88% in terms of pH, 99.98% for electrical conductivity, 99.96% for TDS, and 100% for maximum salinity.

The thirteenth paper, written by A.A. Almaleeh, A.H. Adom, and A. Zakaria, presents a method of classifying three main types of honey according to their botanical origin using UV–Vis spectroscopy and a digital camera. The classification of the honey was based on antioxidant contents and color variations. The authors argue that the honey classification using the fusion method improved significantly with 94% accuracy.

The next paper, written by H. Pariaman, I. Garniwa, I. Surjandari, and B. Sugiarto, analyzes the system availability of integrated maintenance techniques based on reliability, risk, and conditions in a power plant. The authors argue that the integrated maintenance techniques of RCM, RBM, and CBM resulted in increased system availability compared to the separate use of each maintenance technique.

The fifteenth paper, written by M.E. Emetere, examines a weather-influenced Maxwell's electromagnetic model for lightning activities based on charge dynamics, lightning branches, and atmospheric factors. The author argues that lightning occurs at the upper pressure level, while the low pressure level initiates an updraft where air rises and condenses into a cumulonimbus cloud. It can therefore be used as a source of alternative energy.

The sixteenth paper, written by A. Eghdamian and A. Samsudin, proposes an enhanced and modified version of digit scanning from left to right using a Modified Generalized Signed Digit Non-Adjacent Form (MGSDNAF) recoding method. The authors argue that the proposed method can reduce the number of underlying arithmetic operations in single scalar multiplication by 14.1%.

The next paper, written by A.S. Abdalkafor, proposes an Arabic off-line handwritten isolated recognition system based on novel feature extraction techniques and a back-propagation artificial neural network as a classification engine, implemented and tested via a CENPARMI database. The author argues that the competitive recognition accuracy reached up to 96.14%.

The eighteenth paper, written by A. Setiawan and E.A. Setiawan, investigates solar panel optimization using system advisor model (SAM) software. The authors argue that a low proper PV tilt angle with a value of less than 11° and a thin film PV module that considers temperature coefficient characteristics for selected areas of study are recommended.

The nineteenth paper, written by B. Irmawati, H. Shindo, and Y. Matsumoto, proposes a method of generating effective error-injected artificial data to create training examples for preposition error correction tasks. The authors argue that the use of artificial data for training improves preposition error correction performance.

The final paper, written by F.A. Mufarroha and F. Utaminingrum, investigates hand gesture recognition using the adaptive network-based fuzzy inference system. The authors argue that the best accuracy was obtained when the epoch score was 10, and the proposed method resulted in more effective recognition within a short amount of time.

I hope that this special edition of IJTech conveys some new insights into the way we conduct our research. I am pleased to accept and respond to any comment and enquiry you may have on the direction and content of IJTech, and 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