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Fostering Smart City Development to Enhance Quality of Life

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Major global cities are faced with the increased concentration of urban areas and mounting complex problems caused by rapid urbanization and industrialization. Therefore, to have the quality of city life improved while ensuring our environment is sustained, those issues need to be handled by changing the way the urban spaces are managed. Urban development practices should be done in a sustainable way in which cities can adapt and integrate smart solutions to meet the demands of the citizens while keep protecting the environment.

Smart city, with the extensive use of digital technology, has been deployed for urban planning, development, and management to help the city achieve its goals of improving the quality of life, creating a sustainable environment, and enhancing economic development. By having digital technologies play a significant role in all aspects of its urban life, the city can effectively address several emerging urban problems and develop an advanced smart city that considers citizens' active engagement in designing solutions for urban management. Smart infrastructure, industry, energy, healthcare, and transportation using sensor networks, automated systems, smart grid, and further enabling service innovation through smart governance are amongst others of smart city's characteristics. For example, a smart city can deploys autonomous vehicles as the backbone of a public transportation system, offering mobility-as-a-service to the citizen. As a result, on-demand and dynamic route of a driverless car, safer environment, more efficient urban mobility, eliminating congestion and GHG emissions, and providing mobility to people with disabilities and special needs. The technology for healthy building through automated digital technology can optimize building performance, enhance occupant experiences, and meet sustainability goals. Smart city increase citizen's quality of life.

Therefore, the assessment of smart cities is built on measuring the sustainability and livability of cities with the emphasis on the inclusion of technological and informational elements to meet the citizens' needs, optimize existing infrastructure, and increase innovative business through the collaboration amongst city's economic stakeholders.

Smart City: Blending Industrial Revolution 4.0, Society 5.0, and Nature 5.0

As discussed in my previous editorial notes, technology advancement have led to more production of environmentally friendly projects, products, and services. Innovative digital technology (industrial revolution 4.0) supported by a human centered society (society 5.0) is required to balance our economic advancement and environmental regeneration (nature

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5.0). The well-being of our future will be dependent on how we can produce technology that can govern our climate, health, social equity, and stability.

Smart economy through industrial revolution 4.0 aims to increase the competitiveness of a city by establishing the city's innovation ecosystems and enhancing factors such as innovation and entrepreneurship. The smart city's economic sectors are developed by encouraging sharing and collaborative economic activities digitally driven by transparent access to information, which creates high productivity.

Smart society 5.0 attempts to enhance some components such as the education or qualification level, social and ethnic diversity, creativity, mind openness, and participation in public and social life through the application of digital technologies. Smart environment of Nature 5.0 means that a smart city must live with and protect nature, manage its natural resource base, control air pollution, and has an efficient disaster management system. In addition, it should continually upgrade the urban resilience in terms of climate change and create a low-carbon environment focusing on energy efficiency and renewable energy management.

Accelerating Science and Technology Development

Technology has been invented to improve projects, products, or services performance for our benefit. In this edition, we are pleased to present twenty selected papers dedicated to technology development in science and engineering.

The first paper, written by G. Krasniqi, C. Dimitrieska, and S. Lajqi, presents urban wind energy as one of the new renewable ways of producing electricity in Kosovo. The authors argue that the higher power coefficient registered is 34.3% at the wind velocity of 4.5 m/s, while the highest registered power produced is 263.9 W at the wind velocity of 13.5 m/s.

The next paper, written by A. Widyianto, A.S. Baskoro and G. Kiswanto, investigates the welding characteristic and mechanical properties in orbital pulsed current gas tungsten arc welding. The authors argue that the weld geometry has shown the flat position is concave, the overhead position is convex due to the influence of gravity, and the tensile strength of the specimen is reduced.

The third paper, written by D. Rabar, D. Rabar, and D. Pavletic, presents a manufacturing process performance measurement model using a categorical DEA approach for dry-docking. The authors argue that using the performance model, the efficiency scores for all vessels and target improvements for the inefficient vessels can be presented.

The fourth paper, written by A. Esraa, A. Putra, A.I. Mosa, R.M. Dan, and O.H. Attia, presents an empirical model for optimising the sound absorption of single layer MPP based on response surface methodology. The authors argue that the proposed empirical model can be used to select the suitable parameters according to the targeted frequency bandwidth with less computational time.

The fifth paper, written by Y. Susmiati, B. Purwantana, N. Bintoro, and S. Rahayoe, investigates heat transfer characteristics in vertical tubular baffle internal reboiler through dimensional analysis. The authors argue that the model can be used to define material concentration, diameter, and height of the reboiler tube affect the value of the heat transfer coefficient (h).

The next paper, written by S.Riyadi, W.D. Aryawan and I.K.A.P. Utama, investigates the effect of loading condition on resistance of hard-chine semi planning crew boat. The authors argue that the trim had a greater influence on decreasing resistance up to 3.062% than even keel position and the shifting of LCG had a significant effect on resistance changes.

The seventh paper, written by M. Zulkarnain, R.W. Sharudin, and M. Ohshima, investigates various properties of pores such as cell shape, cell size, cell distribution, and percentage of porosity on the thermal conductivity. The authors argue that the reduction of thermal conductivity has a higher percentage of porosity as shown by all cell-shaped foam such as spherical, ellipse, and irregular.

The eighth paper, written by M. Serekpayeva, R. Niyazbekova, K.M. Al Azzam, E.S. Negim, A. Yeleussizova, and A. Ibzhanova, examines the properties of metallurgical slags and dust of electro filters to obtain protective anticorrosive coatings. The authors argue that the hardness of the obtained glass-crystal materials increases in the presence of chromium oxide.

The next paper, written by R. Reningtyas, E. Rahayuningsih, Y. Kusumastuti, and I. Kartini, examines the photofading of natural indigo dye in cotton coated with zinc oxide nanoparticles (ZnONPs) synthesized by the precipitation method. The authors argue that the synthesized ZnONPs provided excellent UV protection to reduce the photofading of cotton dyed with natural indigo.

The tenth paper, written by H.T.B.M. Petrus, A.D.P. Putera, I.W. Warmada, F. Nurjaman, W. Astuti, and A. Prasetya, investigates the kinetics and phase transformation of saprolitic laterite ore reduction process. The authors argue that the best fit model is obtained with the energy activation of 33.68 kJ/mol for anthracite reductant and 10.99 – 18.19 kJ/mol for palm kernel shell reductant.

The eleventh paper, written by N.A. Jamaludin and N.F.C. Harun, examines a facile conjugation of a 6-hydroxylflavone (6HF) biomolecule with polyethylene glycol (PEG) for enhancing conjugate stability. The authors argue that a successful conjugation with a high percentage yield between PEG and 6HF that synthesized by direct esterification in 10 mM HEPES with pH 7.4 at 25°C.

The following paper, written by L. Sapei, R. Agustriyanto, E.W. Fitriani, Z. Levy, and C. Sumampouw, investigates the use of biosilica combined with chitosan particles and chitosan solution to stabilize the interfacial layer between oil droplets and the outer aqueous phase. The authors argue that the resulting Water-in-oil-in-water (W/O/W) emulsions with high stability of ~80-100% are obtained.

The thirteenth paper, written by D. Fitria, M. Scholz, G.M. Swift, and F. Al- Faraj, discusses on the impact of temperature and coagulants on sludge dewaterability. The authors argue that ferric chloride was unaffected by temperature, whereas alum and *M. oleifera* performances were influenced by temperature.

The fourteenth paper, written by Y. Wahyono, Hadiyanto, M.A. Budihardjo, Y. Hariyono, and R.A. Baihaqi, presents multi feedstock biodiesel production from a blend of five oils through transesterification with the variation of moles ratio of methanol. The authors argue that the mole ratios of 1:6 resulted in the highest yield of 92.99% with the conversion of 99.58% mass.

The next paper, written by F. Arifan, R.T.D.W. Broto, S. Sumardiono, Sutaryo, A.L. Dewi, Y.A. Yudanto, and E.F. Sapatra, examines the effect of thermal pretreatment of pineapple peel waste in biogas production. The authors argue that the pretreatment process affects lignin yields, affecting the amount of cellulose and hemicellulose digested by microorganisms.

The sixteenth paper, written by D.K. Baroroh and A. Agarwal, examines the current and potential future applications of Immersive Technology (ImTech). The authors argue that ImTech has a lot of potential applications, especially for supporting smart systems, as an interface between human and artificial intelligence to assist manual operations in manufacturing.

The next paper, written by H. Heryani, A.C. Legowo, N.R. Yanti, Marimin, S. Raharja, Machfud, T. Djatna, S. Martini, T. Baidawi, and I. Afrianto, presents an institutional development in the supply chain system of the oil palm agroindustry. The authors argue that the technology can be deployed in realizing production proses transparency and enhancing the monitoring system for policymakers.

The eighteenth paper, written by R. Setyaningrum, Subagyo, and A. Wijaya, determines the successful product development using Hofstede culture. The authors argue that the use of Hofstede culture as a one-dimensional category with internal, environmental, and future characteristics enables to increase in customer satisfaction.

The nineteenth paper, written by F. Romadlon, F. Lestiana, and N.A. Putri, examines passenger concerns and airport service information during the covid-19 outbreak. The authors argue that the personal decision of the customer mediates the link between the passenger's concern and the provided information from the airport service provider.

The last paper, written by D.N. Prayogo, Komarudin, A. Hidayatno, and A. Mubarak, presents the development of tactical level integrated planning at seaport container terminals in an uncertain environment. The authors argue that the proposed bi-objective of recoverable robust optimization model points out a better solution quality in terms of service level and total costs.

I hope that this edition of IJTech conveys new insights in how we conduct our research. I am pleased to accept and respond to any comment or inquiry 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,

Professor Dr. Mohammed Ali Berawi
Editor in Chief