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# New City Development: Creating a Better Future and Added Value

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The development of new cities requires comprehensive planning that can respond to the challenges of the pace of urbanization such as environmental sustainability, climate change, and socio-economic crisis. It goes without saying that new cities should be constructed for the urban future to meet the growing social and economic needs of populations. The development of new cities represents a tremendous opportunity to boost economic development and modernize infrastructure. Urban technology development and innovation play a significant role in creating a smart city as one of the solutions to urban challenges. A sustainable approach is also important to ensure the fulfillment of future needs through maintaining the ongoing viability of resources.

Smart city development aims to produce a resilient and sustainable city by producing better city services, from improvements in transportation, energy, and water resources to waste disposal and health services. Smart cities can improve a city's ability to use natural resources efficiently, make public transportation more attractive, and further provide data to planners and decision makers to allow them to allocate resources appropriately. In other words, the smart city concept contributes to the formation of a high-quality, healthy, and regenerative built environment that is modeled on a circular economy and has an overall positive impact on the environment.

As in the construction of mega-projects, which are prone to experiencing cost overruns and delays in project development time, the creation of a new city requires careful preparation in terms of planning and project implementation. Well-prepared technical, financial, and good governance frameworks need to be in place before the construction of a new city can be carried out. Implementing accountable and prudent good governance in the development process is among the important factors in the construction of a mega-project.

Science and technology development plays a significant role in achieving sustainable development by improving the efficiency and effectiveness of new and more long-lasting ways of building and living. Investments in green technology, more streamlined and targeted processes, safer materials, and improved performances and outcomes are some of the results of such development. Technological advances in utilizing renewable energy resources, building urban water systems and sustainable public infrastructure, and producing environmentally friendly materials and products are among the pathways along which technology will significantly contribute to sustainable new city development.

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Indonesia is planning to move its capital to a different island, from Jakarta to a new city named Nusantara in East Kalimantan. The new capital's development will begin with the construction of major infrastructure, including the presidential palace and government buildings, and the construction of residential housing, social-commercial precincts, and basic facilities in the main area of the new capital. Public-private partnership, along with long-term modern infrastructure and anchor institutions, are the basic components needed for a successful new capital city.

The new capital city is also expected to focus on innovation and entrepreneurial environments to foster growth and investment to boost economic performance as well as to improve citizens' quality of life. Regional development will be facilitated to represent a nation's progress and to serve as a catalyst for building and spreading centers of productivity and economic activity. An inclusive city for all.

**Empowering Science and Technology Development**

The improvement of technologies that generates alternative methods, techniques, and end products is required to accelerate various developments in all research areas. In this context, this edition presents twenty papers dedicated to systematic and empirical research in science and engineering that foster scientific and technological development.

The first paper, written by L.C. Alfonso-Orjuela, Y.A.C. Gomez, and J.A.P. Sandoval, presents a classification of the ways in which small–medium enterprises (SMEs) in Columbia have adopted information and communication technology (ICT) to increase their productivity and competitiveness. The authors argue that five groups of firms can be delimited using technological tools, departmentalization, and perception to implement ICTs in the organization.

The next paper, written by S. Soegiharto, T.Y.M. Zagloel, Sunaryo, and Komarudin, examines ship inventory routing and cargo stowage planning on chemical tankers. The authors argue that their model successfully integrates stowage planning, which accommodates cargo capacity, ship stability, and ship durability, into the inventory routing.

The third paper, written by A. Maarouf and O.N. Korableva, investigates the relationship between credit constraints and innovation. The authors argue that credit constraints are negatively correlated with the decision of the company to introduce new products or to spend on R&D internally or externally.

The fourth paper, written by Z. Sabara, I.N. Afiah, and R. Umam, presents the integration of green ergonomics by applying the robust decision making (RDM) approach to water resources management. The authors argue that scenarios for determining operational policies for natural resource management are influenced by conditions of economic growth, political conditions, and climate change.

The fifth paper, written by J. Siswanto**,** S. Suakanto, M. Andriani, M. Hardiyanti, and T.F. Kusumasari, presents interview bot development with natural language processing and machine learning. The authors claim that a two-way chatbot to determine the competence level of a person has been successfully developed.

The next paper, written by R. Zuraida, T. Wijayanto, and H. Iridiastadi, characterizes the fatigue associated with prolonged simulated driving by employing electroencephalography. The authors argue that theta waves can be interpreted as manifestations of fatigue and temporal waves as the selected cortical area of concern.

The seventh paper, written by A. Rahman, S.I. Ihsan, and N. Hassan, examines the fuzzy-logic-controlled two-speed electromagnetic gearbox (AEM-2SGB) for an electric vehicle. The authors argue that the AEM-2SGB is a prospective gearbox due to its weight reduction

of 37%–66%, transmission loss reduction of 40%–90%, and battery life enhancement of 5%.

The eighth paper, written by S. Buana, K. Yano, and T. Shinoda, evaluates the methodology for outfitting a ship with equipment for a ballast water management system. The authors argue that a method using ozone is the most appropriate according to the ship designer, while a combination of filter and ultraviolet is regarded as the most proper selection by the shipowner.

The next paper, written by R.M. Ariefianto, Y.S. Hadiwidodo, and S. Rahmawati, examines a wave energy converter (WEC) using a unidirectional cascaded gear system over a short wave period. The authors argue that modifying the mechanical drive system configuration can increase the efficiency of a WEC for a sea state that has certain limitations.

The tenth paper, written by S. Baso, A. Ardianti, A.D.E. Anggriani, Rosmani, and L. Bochary, investigates the added resistance of a ship using a hydro-elastic body in waves. The authors argue that the effect of the hydro-elastic body on the ship resistance is the same as for the rigid body, and that the same behavior can be observed in the added-resistance state.

The eleventh paper, written by H. Maulana and R.F. Sari, seeks to achieve authorship verification of the Federalist Papers corpus. The authors argue that applying the long short-term memory (LSTM) algorithm to authorship identity elimination achieves a good performance.

The next paper, written by M. Farid, M.I. Pratama, A.A. Kuntoro, M.B. Adityawan, F.I.W. Rohmat, and I.R. Moe, presents flood prediction due to land cover change in river basins. The authors argue that for every forest or agricultural area converted into an urban or bare soil area, the flood peak discharge, flood area, and flood volume would slightly increase.

The thirteenth paper, written by A. Kurniawan, T. Yamamoto, A.W. Ekawati, L.N. Salamah, A.A. Amin, and A.T. Yanuar, investigates the characteristics of Cd(II) biosorption into streamer biofilm matrices. The authors argue that the natural streamer biofilm is a promising biosorbent for Cd(II) removal in water pollution treatments.

The fourteenth paper, written by L. Qadariyah, S. Sahila, C. Sirait, C.P.E. Purba, D.S. Bhuana, and Mahfud, investigates the surfactant production of methyl ester sulfonate from virgin coconut oil using aluminum oxide with microwave assistance. The authors argue that the optimum conditions for surfactant production include a microwave power of 450 W and a reactant mole ratio of 1:1.

The next paper, written by K.P. Tulegenovna, E.S. Negim, K.M.A. Azzam, and M.A. Bustam, presents the modification of xanthan gum with methyl methacrylate and investigation of its rheological properties. The authors argue that the properties of XG-g-MMA provide good prospects for this copolymer to be used as a safe thickener in cosmetology or the oil industry.

The sixteenth paper, written by D. Timotius, Y. Kusumastuti, and Rochmadi, presents a characterization and equilibrium study of the drug release of pH-responsive chitosan (CTS)-graft-maleic film (MA). The authors argue that increasing the MA:CTS ratio leads to an increase in tensile strength and a reduction in the elongation at break.

The next paper, written by K.C. Wanta, W. Astuti, H.T.B.M. Petrus, and I. Perdana, examines the product diffusion–controlled leaching of nickel laterite using a low-concentration citric acid leachant under atmospheric conditions. The authors argue that the activation energy for nickel recovery evaluated using their model is better compared to the conventional shrinking-core models.

The eighteenth paper, written by N.Z. Zahari, G.P. Yan, P.M. Tuah, and S.A. Rahim, examines the effects of single and consortia inoculants of crude oil in seawater. The authors argue that the microbial communities, especially in mixtures, can degrade hydrocarbon contaminants more effectively and can be environmentally friendly due to their specific ability to metabolize hydrocarbons.

The nineteenth paper, written by A.B.D. Nandiyanto, R. Ragadhita, A. Ana, and B. Hammouti, presents the physical and mechanical properties of ketapang cookies. The authors argue that the rheological properties of flour, which depends on starch, lipid, and protein components, influence the spread ratio, distributing the components homogeneously and controlling the dimensions and pores inside the cookies.

The last paper, written by N.A.C. Imani, Y. Kusumastuti, H.T.B.M. Petrus, D. Timotius, N.R.E. Putri, and M. Kobayashi, investigates the kinetic studies of film models made of chitosan and nanosilica. The authors argue that the chitosan/nanosilica composite films have great potential to be used as materials for drug carriers.

I hope that this edition of *IJTech* conveys some new insights into the way we conduct our research. I am pleased to accept and respond to any comment or 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,

Professor Dr. Mohammed Ali Berawi
Editor in Chief