Editorial Notes

Welcome to International Journal of Technology

Theme: Improving Productivity, Quality, and Process Efficiency

Today's fast-paced manufacturing and construction industries rely on high performance to ensure quality and added-value of products/projects. Due to the recent technological advancements, industrial players are moving towards the use of a more sophisticated solutions allowing for maximum achievements and capabilities to improve products/projects performance. Productivity measurements clearly indicate and demonstrate how efficient an industry is using its resources to produce quality products or projects. An increase in quality most often results in lower costs as re-work and unnecessary processes are eliminated.

There are many improvements in productivity that occur as a result of technology. Significant progress in technology has given the industrial players new options for improving productivity. Technology-enabled business process improvements have been employed as a way to create more value to stakeholders and end users. Strategic approach is conducted by business entity to reduce production constraints and to develop more competitive capability in order to ensure that the product/project is created according to a particular technical specification and the requirements of client/customer. Identifying key added values of a product/project design, upgrading technology and quality control, minimizing waste and unnecessary processes in product/project development are seen as options to improve business efficiency and performance. Furthermore, innovation has successfully built new technologies to boost productivity and performance of the product/project.

This season, we are pleased to present ten selected papers dedicated to improving productivity, quality and process efficiency of product/project in various knowledge areas. This issue is particularly aimed to promote innovative processes of creating and delivering quality products/projects.

The first paper, written by T.Kusumaningsih, Jumina, D Siswanta, Mustofa, K. Ohto and H. Kawakita, evaluates the adsorption characteristics and properties of resin poly-tetra-p-allylcalix[4]arene tetra acetic acid from the p-t-butylphenol. The synthesized resin was applied as an adsorbent for Cr(III) and Pb(II) metal ions. The optimum pH for Cr(III) and Pb(II) metal ions adsorption on the resin was ranging from 4 to 6 and reached an equilibrium in 40 minutes. The adsorption capacities for Cr(III) and Pb(II) metal ions were 323.0 µmole/g and 33.4 µmole/g, while the energy needed for adsorption were 30.4 kJ/mole and 39.7 kJ/mole, respectively. As a conclusion, the authors suggested that the outstanding adsorption abilities of the resin for Cr(III) and Pb(II) metal ions would provide good prospects for the application of polluted water processing and environmental protection.

The second paper, written by M.Z.H. Rozaini, R.C. Ali , and L.C.Ros, provides an assessment of value determination in single and mixed surfactant systems employing fluorescence technique. From the fluorescence method, the CMC value for single surfactant system of T20 and HTAB were 1.6293 $x10^{-3}$ M and 2.7439x 10^{-3} M, respectively. While for CMC_1 and CMC_{11} value for mixed surfactant system at mole ratio 0.2: 0.8 (T20: HTAB) were CMC_1: 2.358 $x10^{-3}$ M and CMC_{11}: 7.0741 $x10^{-3}$ M. These findings were observed above the theoretical values, which indicated the synergistic behavior of both surfactants.

The third paper, written by M. Rumbayan and K. Nagasaka, discusses solar irradiation estimation with Artificial Neural Network (ANN) method using meteorological data. Fifteen combinations of ANN models are developed and evaluated. Multi-layer perceptron ANN models with 7 input variables are proposed to estimate the global solar irradiation. To evaluate the performance of ANN models, statistical error analysis of mean absolute percentage error (MAPE), mean absolute bias error (MABE) and root mean square error (RMSE) are conducted to the data. The result showed that the best value for MAPE, MABE, RMSE were 7.4%, 1.10 mj/m^2 and 0.17 mj/m^2, respectively, as 7 neurons were set up in the hidden layer.

The fourth paper, written by F.Y. Zulkifli, A. Atmaja, E.T. Rahardjo, presents the implementation of single cell composite right – left handed transmission line for ultra wideband bandpass filter. A design and fabrication of a compact ultra-wideband (UWB) bandpass filter (BPF) using single cell Composite Right-Left Handed Transmission Line (CRLH-TL) is examined. This compact filter design is achieved using a single cell CRLH-TL structure which is implemented on the FR4 dielectric substrate with permittivitty 4.4 and dielectric thickness 1.6 mm. A six-interdigital filter is designed and resulting in reduced filter total area up to 7%. This compact filter operates from 4 GHz to 9.5 GHz with insertion loss less than -1.5dB.

The fifth paper, written by N.M. Nursam and L. Muliani, investigates the performance of dye solar cell by comparing the utilization of transparent and opaque TiO_2 pastes as the photoelectrodes. Two types of TiO_2 photoelectrodes with different transparency characteristics (i.e. N-719 and Z-907) were prepared under the same conditions. The SEM images showed that the transparent TiO_2 particles had relatively larger aggregates with less uniformity compared to that of the opaque TiO_2 film. It is found that the best average efficiency achieved was 3.78% for cells with a total active area of 2 cm^2, which was shown by sample featuring transparent TiO_2 and dye Z-907.

The next paper, written by A.I. Karayan, D. Ferdian, and Y.Pratesa, presents the synthesis of TiO_2 nanotubes on Ti-10Ta-10Nb thin film and the effect of potential applied on the tube size, length and morphology. The Ti-10Ta-10Nb thin film was deposited by dc magnetron sputtering on the CP Ti substrate. The maximum potential for nanopore synthesis of Ti-10Ta-10Nb by anodization in the solution containing 1M H_3PO_4 + 1.5wt % HF was 8 V. At this potential, the average diameter of a nanopore was approximately 50 nm. The length of the nanotubes varied from 700 – 900 nm, with an exception at the potential of 10V where a slight decrease was noticed.

The seventh paper, written by M.A. Puspasari and Y.H Lee, investigates factors affecting the performance of target acquisition tasks for touchpads. This paper examines the effect of two touchpad sizes, i.e. large size and small size, position filters, and control-display gains on acquiring targets that appeared in eight positions, at three distances and 3 different levels of target size. The result showed that touchpad size affected the movement time, error count, movement count, and re-entry count significantly. Filter 50 and Gain 2 for primary movement and Filter 30 and Gain 0.5 for secondary movement were the best combinations for participants to achieve optimum performance.

The eighth paper, written by Zulkarnain, P. Leviäkangas, M. Tarkiainen, and T Kivento, groups business intelligence and market foresight analyses on electric vehicles (EV) in the current market activities and offerings into clusters. The clusters are divided into three main sources: market foresight analyses, information service development activities, and probe of electric vehicle test sites. The growing potential of EV market has stimulated the development of several types of services that support EV deployment, e.g. information services. The test sites are already emerging around the globe and the driving force seems to be automotive industry, followed by battery suppliers and energy utilities, especially those which not only have their own production facilities, but also their own networks.

The next paper, written by DS Saroso, discusses decision-making models for quality improvement. The discussion begins with a list of some existing models and then grouped into models approaches that investigate the impact of quality improvement on the stages of production process. The models are grouped into different categories based on the different stages of product life-cycle (Front-End, Design and Development, Production, Marketing, and Post-Sale). From the result of analysis and discussion on the decision-making models of product quality improvement, it is found that there are two main values that need to be considered for optimal quality improvement, i.e.: costs of evaluation and prevention and cost of failure for both internal and external failures.

The last paper, written by F. Firmawan, F. Othman, and K. Yahya, examines project performance and waste reduction in construction projects. The authors argue that the adoption of environmental awareness in the context of building design, the application of alternative and/or recycled/environmentally friendly materials, along with a number of green technologies and building systems featured in the building concept will deliver greater value without jeopardizing the ecology. Meanwhile, the adoption of pre-fabrication construction methods, intelligent excavation works, Reduce-Reuse-Recycle principles, and environmentally-aware on-site practices can minimize the waste produced and the local environmental impact arised during project execution.

I hope that this edition of IJTech conveys some new insights in 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 editorial desk,

Dr. Mohammed Ali Berawi
Editor-in-Chief
International Journal of Technology (IJTech)