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International Journal of Engineering Research and Technology (IJERT)

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Chatibi youness, PhD, Mathematics Department, ENSAM/Moulay Ismaïl University, **Morocco**.

Area of Research Interest: Fractional Calculus, Method of Resolution of Fractional Differential Equations and Applications.

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Area of Interest : Power Quality, Electromagnetic Compatibility

Dr. Liew Pay Jun, Senior Lecturer, Department Of Manufacturing Process, Faculty Of Manufacturing Engineering, Universiti Teknikal Malaysia Melaka, Durian Tunggal, Melaka, **Malaysia**.

Area of Interest : Electrical Discharge Machining, Machining, Micro/Nano Machining, Nanofluid

Jong-Wook Lee, Electrical & Computer Engineering, Ajou University, Worldcupro 206, Yeongtong-gu. 16499, Geonggi-do, **South Korea**.

Area of Interest: | Device structure and materials for sub-0.5V voltage operation, | Scaling-down enabling technology, | Low-power, high-speed devices and circuits.

Dr. Ishita Roy, Upward Bound STEM TRIO, Long Beach City College, Los Angeles, California, **United States of America**.

Area of Interest: Civil Environmental Engineering, Environment Engineering, Energy

Dr. Nanaji Yerramsetti, Department of Chemistry & Biochemistry, Texas Tech University, Lubbock, Texas, **USA**.

Area of Interest: Organic synthesis, asymmetric synthesis, Organo-metallic chemistry

Prof. Dr. Ashok K. Singh, University of Nevada, Las Vegas (UNLV), William F. Harrah College of Hospitality, Las Vegas, Nevada, **USA**.

Area of Interest: Applied Statistics, Bayesian Inference, Spatial and Temporal Analysis of Data, Structural Equations Modeling, Panel Data Analysis

Mohammad Amin Horiri Ardebili, Civil Environmental and Architectural Engineering (CEAE), University of Colorado at Boulder, Colorado, Boulder, **USA**.

Area of Interest: Concrete dams; Fluid-structure-interaction; Earthquake engineering; PBEE; Special structures

Giriprasath Gururajan, Bartlesville Technology Center, ConocoPhillips Company Oklahoma, Bartlesville, **USA**.

Area of Interest: Polymer, Vibrational Spectroscopy, Electrospinning, Polymer characterization.

Goutam Ghoshal, Department of Research and Development, Company: Acoustic MedSystem Inc, Savoy, Illinois, **USA**.

Area of Interest: Biomedical ultrasound, therapeutic ultrasound, high-intensity focused ultrasound, signal processing, ultrasound imaging, computational mechanics, solid mechanics, image-guided intervention, acoustic, ultrasonic non-destructive testing, mechanical stress analysis

Dr. Dong-Chan Kim, Department of Biomedical Laboratory Science, Gimcheon University, Gimcheon City, Gyeongbuk Province, **South Korea**.

Area of Interest: Molecular Pharmacology, Neuropharmacology, Natureal Herb Pharmacology

Dr. Sulalit Bandyopadhyay, Department of Chemical Engineering, Norwegian University of Science and Technology (NTNU), Trondheim, Trøndelag, **Norway**.

Area of Interest: Synthesis, characterization and functionalization of nanoparticles, development of nanoparticle based hydrological tracers, drug delivery, bioimaging, nanosystems in drilling fluids and enhanced oil recovery, nanogels, polymeric nanoparticles, polymerization, colloids and interfaces.

Dr. Siamak Hoseinzadeh, Islamic Azad University, Division Mechanical Engineering, Tehran, **Iran**.

Area of Interest: Green House, Zero Energy, Building Material, Building Energy Efficiency, PCM Nanocomposites, Thin Films, Synthesis, Structural, Optical and Electrical properties, Smart Material and Devices, Electrochromic and Thermochromic Devices.

Dr. Basim Abu-Jdayil, Chemical & Petroleum Engineering Department, UAE

University, Al Ain, Abu Dhabi, **UAE.**

Area of Interest: Rheology, Fluid mechanics, Composite materials, EOR

Prof. Abdullah M. Al-Shaalan, EE department, College of Engineering, King Saud University Riyadh, **Kingdom of Saudi Arabia.**

Dr. Joni Welman Simatupang, School of Engineering, President University, Cikarang, Bekasi-17550, **Indonesia.**

Area of Interest: Electrical Engineering, Semi Conductor Technology, Opto Electronic Devices, Optical Networks, Electrical Sensors, Design and Fabrication of Semiconductors and optoelectronic devices.

Sameer Chand Pudaruth, Computer Science and Engineering Department, University of Mauritius, Reduit, Moka, Port Louis, **Republic of Mauritius.**

Area of Interest: Multimedia, Computer Vision, ICT in Education, Software Engineering

Mohd Hafiz bin Jali, Faculty of Electrical Engineering, Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100, Melaka, **Malaysia.**

Area of Interest: Control system, Signal Processing, Rehabilitation, Human assist technology. Pattern Recognition, Robotic.

Rajeev Ahuja, Physics Department, Uppsala University, Box 530, 751 21 Uppsala, **Sweden.**

Area of interest: Computational Materials Science, Electronic Materials, Spintronics, High pressure, Dynamics.

S.A. Soliman, Electrical Engineering Department, University of Qatar, P. O. Box 2713 Doha, **Qatar.**

Area of Interest: Applications of State Estimation to Electric Power Systems, Fuzzy and Neural System Applications to Electric Power Systems.

Vincenzo Niola, Pofessor, Department Of Industial Engineering,, University Of Naples Federico Ii – Engineering Faculty, Naples, **Italy.**

Area of Interest : Mechanics, Robotics, Diagnostics Of Mechanical Systems, Non-Linear Analysis Of Mechanical Systems, Vibrations, Tribology

Rose Farahiyan Munawar, Senior Lecturer, Department Of Engineering Materials, Faculty Of Manufacturing Engineering, Universiti Teknikal Malaysia Melaka, **Malaysia.**

Area of Interest : Nanotechnology, Environmental And Green Materials, Cellulose Derivatives, Materials Characterization And Materials Science & Engineering

Ruaa Alsabah, Lecturer, Department Of Computer Science, Freha Campus, Kerbala University, Kerbala, **Iraq.**

Area of Interest : Internet Of Things & Big Data Analysis, Wireless Communication 4G, 5G And Beyond, Microwave Remote Sensing, Space-Borne –

Airborne Platforms And Calibration And Validation Measurements.

Dr. Asim Datta, Associate Professor & Head, Dept. Of Electrical Engineering, Mizoram University (A Central University), Tanhril, Aizawl-796004, Mizoram, **India**.

Area of Interest : Electical Pever Systems, Renewable Energy Sources, Embedded Systems

Pranav Mahamuni, Research Assistant, Department Of Mechanical Engineering, Stony Brook University, Stony Brook, New York, **United States Of America**.

Area of Interest : Mechanical Engineering - Cad/Cam, Product Design, Rapid Prototyping, Finite Element Analysis

Dr. Diego Bellan, Professor, Department Of Electronics, Information And Bioengineering, Politecnico Di Milano, Piazza Leonardo Da Vinci 32, 20133, Milan, **Italy**.

Area of Interest : Power Quality, Electromagnetic Compatibility

Dr. Claudia Espro, Assistant Professor, Department Of Engineering, Contrada Di Dio, 4° Piano, Blocco C, 98166 Messina, **Italy**.

Area of Interest : Heterogeneous Catalysis And Development Of Novel Catalytic Green Processes. Catalytic Conversion Of Natural Gas And Light Alkanes Into Intermediates, Fuels And Chemicals Of Higher Added Value. Conversion Of Renewable Biomass For The Production Of Bulk Chemicals, Electrochemical Sensors

Dr. Massila Kamalrudin, Deputy Dean, Associate Professor, Faculty of Information Technology and Communication , Institute of Technology Management and Enterpreneurship, Universiti Teknikal Malaysia Melaka, **Malaysia**.

Area of Interest : ICT, software engineering

Dr. Nilamadhab Mishra, Assistant Professor, School Of Computing, Debre Berhan University, Ministry of Education, Government of Ethiopia, **Ethiopia**.

Area of Interest : Encompass Network Centric Data Management, Data Science: - Analytics and Applications, CIoT Big-Data System, and Cognitive Apps Design & Explorations.

Dr. Liew Pay Jun, Senior Lecturer, Department Of Manufacturing Process, Faculty Of Manufacturing Engineering, Universiti Teknikal Malaysia Melaka, Durian Tunggal, Melaka, **Malaysia**.

Area of Interest : Electrical discharge machining, machining, micro/nano machining, nanofluid

Dr. G.PARAMASIVAM , Associate Professor, Department Of Computer Science, KG COLLEGE OF ARTS AND SCIENCE, Tamilnadu, **India**.

Area of Interest : Image processing, Computer Network

Dr. Ch. Swapna Priya, Assistant Professor, Department Computer Sceince And Engineering, Vignan's institute of Information Technology, Visakhapatnam, Andhra

Pradesh, **India**.

Area of Interest : Image processing, Pattern recognition deep learning, machine learning

Dr. K. Sangeetha, Assistant Professor, Department Of Computer Science & Engineering, SNS College of Technology, Coimbatore, Tamilnadu, **India**.

Area of Interest : Theory of computation, Computer Networks, Advanced Computer Architecture, Operating Systems, Computer Programming, Network Security, Object Oriented Analysis and Design and Data Base Management System

Dr. Deepali Gupta, Professor And Head, Department Of Computer Science & Engineering, Maharishi Markandeshwar University, Sadopur, Sadopur, Ambala, **India**.

Area of Interest : Computer Engineering & Information Technology, Software Engineering, Genetic Algorithms and Cloud Computing

Dr. Ghassan Fadhil Smaisim, Associate Professor, Department of Mechanical Engineering, University of Kufa, Faculty of Engineering, Kufa, P.O. Box: 21, Najaf Government. **Iraq**.

Area of Interest : Enhancement Heat Transfer, Renewable Energy, Fluid Mechanics, Thermal Nanofluid Flow, Power Generation, Solar Energy, CFD.

Dr. Darshankumar Chandrakant Dalwadi, Associate Professor, Department of Electronics and Communication Department, Birla Vishvakarma Mahavidyalaya Engineering College, Post Box No. 20, **India**.

Area of Interest : Digital Communication, Wireless Communication and M Tech Information Theory and Coding

Jong-Wook Lee, Electrical & Computer Engineering, Ajou University, Worldcupro 206, Yeongtong-gu. 16499, Geonggi-do, **South Korea**.

Area of Interest: I Device structure and materials for sub-0.5V voltage operation, I Scaling-down enabling technology, I Low-power, high-speed devices and circuits.

Mohd Hafiz bin Jali, Faculty of Electrical Engineering, Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100, Melaka, **Malaysia**.

Area of Interest: Control system, Signal Processing, Rehabilitation, Human assist technology. Pattern Recognition, Robotic.

Timon Rabczuk, Chair of Computational Mechanics, Bauhaus University Weimar, Marienstrasse 15, 99423 Weimar, **Germany**.

Hacene Mahmoudi, Vice Rector for Animation, promotion of scientific research, Hassiba Benbouali University, B.P. 151, Chlef, **Algeria**.

Mircea Cristian DUDESCU, Technical University of Cluj-Napoca, Faculty of Mechanical Engineering, Departament of Mechanical Engineering, B-dul Muncii 103-105, 400641 Cluj-Napoca, **Romania**.

Area of interest: mechanics of materials, experimental mechanics, mechanical

testing, structural analysis of MEMS.

Rajeev Ahuja, Physics Department, Uppsala University, Box 530, 751 21 Uppsala, **Sweden**.

Area of interest: Computational Materials Science, Electronic Materials, Spintronics, High pressure, Dynamics.

Shigeru Aoki, Department of Mechanical Engineering, Tokyo Metropolitan College of Technology, Shinagawa-ku, Tokyo 140-0011, **Japan**.

Area of Interest: Random vibration, Seismic response of mechanical system, Approximate analysis of nonlinear vibration.

G.Q. Chen, Department of Mechanics and Engineering science, Peking University, Beijing 100871, **China**.

Area of Interest: CFD (Computational fluid dynamics), energy and resources engineering, and systems ecology.

Anna Laura Pisello, Department of Engineering, CIRIAF – Interuniversity Research Center, University of Perugia, **Italy**.

Dr. Jahar Sarkar, Department of Mechanical Engineering, IIT (BHU) Varanasi, UP-221005, **India**.

Area of Interest: Energy, Thermal & Fluid Engineering.

Verena Kantere, Centre Universitaire d'Informatique, University of Geneva, Bâtiment A, Route de Drize 7, 1227 Carouge, **Switzerland**.

B.T.F. Chung, Department of Mechanical Engineering, University of Akron, Akron, Ohio 44325, **USA**.

Area of interest: Heat Transfer with Phase Changes, Optimum Design of Extended Surfaces, Radiative Heat Transfer System.

Marcelo J.S. De Lemos, Departamento de Energia - IEME, Instituto Tecnológico de Aeronáutica - ITA, 12228-900 São José dos Campos S.P. - **Brazil**.

Area of interest: Turbulence Modeling, Porous Media, Combustion in Porous Media, Numerical Methods, Finite Volume.

Dimitris Drikakis, Head of Aerospace Sciences Department, Cranfield University, School of Engineering, Cranfield, MK43 0AL, **United Kingdom**.

Area of Interest: Computational Fluid Dynamics, Aerodynamics, Turbulence Gas dynamics, Computational Nanotechnology.

A.S. Al-Harthy, Department of Civil, Surveying and Environmental Engineering, University of Newcastle, Callaghan, NSW 2308 **Australia**.

Area of interest: Concrete material and durability, Recycling construction materials, reliability assessment of structures.

S.Z. Kassab, Mechanical Engineering Department, Faculty of Engineering,

Alexandria University, Alexandria, 21544 **Egypt.**

Area of Interest : Experimental Fluid Mechanics, Lubrication, Energy, Environment and Pollution.

Bashar El-Khasawneh, Chairman, Industrial Engineering Department, JUST, P.O. Box 3030, Irbid 22110 **Jordan.**

Area of Interest: Design process and manufacturing-related sciences and processes, advanced and parallel kinematics machine tools.

Kazuhiko Kudo, Laboratory of Micro-Energy Systems, Division of Human Mechanical Systems and Design, Graduate School of Engineering, Hokkaido University, **Japan.**

Area of interest: Radiative heat transfer analysis, transient analysis on surface tension.

Carlos Mario Morales Bautista, Calzada Olmeca 105. Cerrada Chiltepec No. 1. Fraccionamiento la Venta. Villa Parrilla II. C.P. 86280. Villahermosa, Centro, Tabasco, **Mexico.**

Ihab Obaidat, Department Of Physics, College of Science, United Arab Emirates University, P.O. Box 15551, Al Ain, **UAE.**

Area of Interest: Nanomagnetism, Superconductivity

Huihe QIU, Department of Mechanical Engineering, The Hong Kong University of Science and Technology, Clear Water Bay, Kowloon **Hong Kong.**

Area of Interest: Transport phenomena in microscale multiphase flows, micro sensors and actuators, optical diagnostics and instrumentation

S.A. Soliman, Electrical Engineering Department, University of Qatar, P. O. Box 2713 Doha, **Qatar.**

Area of Interest: Applications of State Estimation to Electric Power Systems, Fuzzy and Neural System Applications to Electric Power Systems

Dimitri V. Val, Dept. of Structural Engineering, Faculty of Civil and Environmental Engineering, Technion - Israel Institute of Technology, Haifa 32000, **Israel**

Area of Interest: structural safety and reliability; analysis, design, and assessment of reinforced concrete and steel structures

Guo-Xiang Wang, Department of Mechanical Engineering, The University of Akron, Akron OH 44325-3903 **USA.**

Area of Interest: Heat and Mass Transfer, Materials Processing, Solidification Theory and Application

Samir Mekid, Mechanical Engineering Department, King Fahd University of Petroleum and Minerals PO Box 155, Dhahran, 31261, **Saudi Arabia.**

Abdul Razak Rehmat, Department of Bioprocess & Polymer Engineering, Faculty of Chemical & Energy Engineering, Universiti Teknologi Malaysia, 81310 Johor

Bahru, **Malaysia.**

Area of Interest: Polymer Processing and Rheology, Biobased Polymer Composite, Microwave Processing of Polymer

V.R. Mudinepalli, Department of Physics, National Taiwan Normal University, Taipei, 11677, **Taiwan.**

Damodar Maity, Civil Engineering Department Indian Institute of Technology, Kharagpur, West Bengal, **India.**

Area of Interest: Damage Assessment of Structures; Seismic Resistant of Structures; Fluid-Structure Interaction; Sloshing; Concrete Gravity Dam

NG EYK, School of Mechanical & Aerospace Engineering, Nanyang Technological University, 50 Nanyang Avenue, 639798 **Singapore.**

Area of Interest: biomedical engg; computational fluid dynamics and numerical heat transfer

Mohammad Luqman, Chemical Engineering Department King Saud University Chemical Engineering Department, Riyadh, **Saudi Arabia.**

Area of Interest: Polymer Nanocomposites, Polymer/Plastic, Ionomers, Nanocomposites

Mohammad Valipour, Department of Irrigation and Drainage Engineering, College of Abureyhan, University of Tehran, Pakdasht, Tehran, **Iran.**

Area of Interest: Surface and pressurized irrigation, Drainage engineering, Fluid mechanics, Heat transfer in soil media

Najm Obaid Salim Alghazali, Department of Civil Engineering, Babylon University, Hilla, Babylon, **Iraq.**

Area of Interest: Hydraulic Structures, Hydraulics, Engineering Hydrology, Groundwater Hydrology, Dams Engineering

Sushant K. Singh, Earth and Environmental Studies Department, Montclair State University, Montclair, 07043, New Jersey, **USA.**

Area of Interest: Environmental pollution, Environmental management, Environmental toxicology, Environmental policy

Hongseok Choi, Department of Mechanical Engineering, Clemson University, 205 Fluor Daniel Bldg. Clemson, SC 29634 **USA.**

Ling Zhou, National Research Center of Pumps, Jiangsu University, No.301 Xuefu Road, Zhenjiang, Jiangsu 212013, **China.**

Area of Interest : Fluids Engineering, Multiphase flow, CFD (Computational Fluid Dynamics)

International Journal of Engineering Research and Technology (IJERT)

Volume 13, Number 11 (2020)

Contents

ACO-Based Power Allocation for Throughput Maximization in the Downlink 5G NOMA Systems

pp. 3072-3079

Osama Abuajwa, Chee Keong Tan, Yin Hoe Ng and Ching Kwang Lee

Sustainability: The Big Challenge

pp. 3080-3098

Jerusha Joseph and Freddie L. Inambao

The Effect of Synthesis Temperature on Carbon Nanospheres from Palm Kernel Fiber

pp. 3099-3108

Oluwafemi E. Ige, Freddie L. Inambao and Gloria A. Adewumi

Perceptions of Solar Desalination in South Africa

pp. 3109-3124

Devesh Singh and Freddie L. Inambao

Prediction of the Impact of Tower Shading on Resource Parameters and Performance by Using LiDAR

pp. 3125-3144

Maduako E. Okorie and Freddie Inambao

A Genetic Algorithm Integrated Approach for Efficient Relay Nodes Placement

pp. 3145-3155

Sardar Anisul Haque, Mohammed Alreshoodi, Bader Alshaqqawi, Ibrahim Alsukayti and Khalid Alsatami

Automatic Bell Pepper Colour Detector and Sorting Machine

pp. 3156-3166

Gophela Seiphepi, Adamu Murtala Zungeru, Jwaone Gaboitaolelwe, Caspar Lebekwe and Bokani Mtengi

Design and Simulation of an Automated Motion Sensing Sprinkler System

pp. 3167-3177

Masa Thema, Adamu Murtala Zungeru, Jwaone Gaboitaolelwe, Bokani Mtengi and Caspar Lebekwe

Minimizing Heat Loss Rate in Kaolin Thermal Insulation Layer in the Range of 800 to 1000 OC

pp. 3178-3188

Ogunrinola Iyanuoluwa Enoch, Akinyemi Marvel Lola, Ndubuisi Amanda, Boyo Henry, Emeteri Moses, Inegbenebor Anthony, and Aizebeokhai Ahzegbobor Philips

Sustainable Home Energy Management of Movement Control Order due to Pandemic Covid-19 by Using 5Core Procedure Method

pp. 3189-3193

Mohamad Fani Sulaima, Nawa Izzati Ahmad Zaki, Musthafah Mohd Tahir, Muhd Muhtazam Noor Din and Zul Hasrizal Bohari

The Effect of Applying Imperial Research on Sustainable Industrial Areas (SIA) Approach

pp. 3194-3207

Eng-Samah Ahmed Sayed. Prof. Dr Ahmed Aouf and Dr Tamer Abd Elazizi

Application of the Principle of Compressible flow in the Conservation of Energy and performance characteristics of Hydraulic Dampers

pp. 3208-3216

MI Matshaba, PB Sob, TB Tengen and AA Alugongo

Enhanced Constrained Local Models (CLM) for Facial Feature Detection

pp. 3217-3221

Ayah Alsarayreh and Fatma Susilawati Mohamad

Behavior of Precast Reinforced Concrete Beam-Column Connection by Double Straight Notch Models under Lateral Cyclic Loading

pp. 3222-3229

Ruminsar Simbolon, Herman Parung, Rita Irmawaty and Arwin Amiruddin

A Comprehensive Survey Study on the Characteristics of Virtual Reality Game

pp. 3230-3233

Tian-Yu Yu and Seok-Kyoo Kim

Levelized Cost of Electricity in Colombia under New Fiscal Incentives

pp. 3234-3239

Juan David Saldarriaga-Loaiza, Jesús María López-Lezama and Fernando Villada-Duque

State of Health Monitoring of a Battery Module Using Multilayer Neural Network and Internal Resistance

pp. 3240-3246

Jong-Hyun Lee, Hyun-Sil Kim and In-Soo Lee

Forecasting Prices in Financial Markets Using Artificial Neural Networks

pp. 3247-3250

Fernando Villada-Duque, Jesús María López-Lezama and Jorge Barrientos-Marín

Losses in the Nigerian Distribution Systems: A review of classification and strategies for mitigation

pp. 3251-3254

Orovwode Hope, Matthew Simeon, Amuta, Elizabeth and Alashiri, Olaitan

Fast and Slow Dynamics in DC/DC Converters with MPPT for Applications in Photovoltaic Systems

pp. 3255-3261

Yesika A. Gutiérrez, José R. Ortiz-Castrillón, Nicolás Muñoz-Galeano, Juan B. Cano-Quintero and Jesús M. López-Lezama

An Interior-Architecture Concept for Fashion-Accessory-Interior: Transforming Space from Body to Transformable Fashion Interior

pp. 3262-3265

Rudy Trisno, Fermanto Lianto and Mieke Choandi

Effect of the Air-Pressure Differences of the Wheelchair Tires on User's Upper Extremity Muscle Activities and Acceleration Changes

pp. 3266-3271

Se-Yeon Park, Soo-Han Kim and Du-Jin Park

A Methodology for Obtaining the References of Voltages and Currents in Power Electronics Devices

pp. 3272-3277

Nicolás Muñoz Galeano, Jesús María López Lezama and Fernando Villada Duque

Efforts to Improve the Financial Performance of Manufacturing Companies Based on Environmental Performance, Corporate Social Responsibility and Intellectual Capital

pp. 3278-3286

Nursaid, Nurul Qomariah and Eko Budi Satoto

A Study on Comparative Evaluation of Software Reliability Model using Exponential-exponential and Burr-Hatke-exponential Life Distribution

pp. 3287-3291

Hee-Cheul Kim and Song-Chul Moon

Flight Control of a 1-DOF Helicopter System using a Sliding Mode Controller for Disturbance Rejection

pp. 3292-3297

Cuero Jairo, Vargas Javier and Jacinto Edwar

Reuse of Chicken Eggshell Ash and Natural Zeolite Catalyst on Palm Oil Transesterification

pp. 3298-3302

Taslim, Iriany, Mawaddah Nur Tambak, and Okta Bani

A Hybrid Genetic Algorithm Applied to the Transmission Network Expansion Planning Considering Non-conventional Solution Candidates

pp. 3303-3309

Jaime Andrés López López, Jesús María López Lezama and Nicolás Muñoz Galeano

A Numerical Study about the Flight of the Dragonfly: 2D gliding and 3D hovering regimes

pp. 3310-3320

Lorenzo Benedetti, Giovanni Bianchi, Simone Cinquemani and Marco Belloli

Elucidation of MHD Boundary Layer Flow Past a Plate with Viscous Dissipation

pp. 3321-3327

Bhriku Kumar Kalita, Rita Choudhury and Paban Dhar

A Saudi Sign Language Recognition System based on Convolutional Neural Networks

pp. 3328-3334

Alaa H Al-Obodi, Ameerh M Al-Hanine, Khalda N Al-Harbi, Maryam S Al-Dawas, and Amal A. Al-Shargabi

Mixing and Reuse of Polymer Laser Sintering Powders to Ensure Homogeneity – A Review

pp. 3335-3341

Fredrick M. Mwanja, Maina Maringa and Kobus van der Walt

Powder Characterization for a New Selective Laser Sintering Polypropylene Material (Laser PP CP 60) after Single Print Cycle Degradation

pp. 3342-3358

Fredrick M. Mwanja, Maina Maringa and Kobus van der Walt

The Labelling of Genetically Modified Foods in India: Consumer's Risk Perception, Trust, and Knowledge

pp. 3359-3366

Vyakhaya Bhatia, Sushant Malik, Dharmesh K. Mishra and Dipen Paul

On Screen Display Module

pp. 3367-3371

Esperanza Camargo Casallas, Luis Alberto Jaime Hernández and Cristian Ancizar Bermúdez Bello

Influences of Skill, Knowledge, Attitude, and Morality on Job Achievement

pp. 3372-3376

Heri Sudarmaji, Luthfiyah Nurlaela and Eko Hariadi

A Novel Formulation of Ecosystem Health Index in Urban Areas of Java Island, Indonesia

pp. 3377-3385

Arief Sabdo Yuwono, Dewi Wulandari, Rahayu Widyastuti, Muhammad Riva Algar and Ridla Arifriana

Making Sense of The Politics of Recognition: Indicators of Religious Tolerance in Banten, Indonesia

pp. 3386-3397

Riswanda, M Dian Hikmawan, Gilang Ramadhan and Bayu Nurrohman

Investigation of Mechanical Behaviour of Laser Welded Butt Joint of Transformed Induced Plasticity (TRIP) Steel with effect Laser Incident Angle

pp. 3398-3403

Khot Rahul S and Venkateswara Rao T

A Novel Hybrid Approach for Access Control in Cloud Computing

pp. 3404-3414

Sara Alayda, Najad.A. Almowaysher, Mamoona Humayun and NZ Jhanjhi

EEG Analysis of Brain Activity Changes Depending on Illuminance Level and Video Type

pp. 3415-3427

Kiseong Kim, Hyesun Joo, Sangjeong Moon, Yejin Han and Young Jun Choi

Opportunities for Higher Education of Artificial Intelligence in Korea

pp. 3428-3430

Ki-Seok Choi

Designing Rapid Rating System of Smart Economy to Sustain and Develop Cities in Egypt

pp. 3431-3443

Eng. Esraa Magdy, Professor Dr. Tarek Zaki and Dr. Walid Bayoumi

Using Big Data Analytics to Design an Intelligent Market Basket-Case Study at Sameh Mall

pp. 3444-3455

Farah Almaslamani, Raneem Abuhussein, Hanan Saleet, Laith AbuHilal and Nader Santarisi

Smart Solution For Enhancing Storage Location Assignments In WMS Using Genetic Algorithm

pp. 3456-3463

Hanan Saleet

Application of Remote Control Technology for a Homogenizing Vacuum Machine

pp. 3464-3468

Ayrat Irekovich Badriev

Comparative Performance Analysis of Private and Public Companies' in the Oil Industry Sector: Russia and the World

pp. 3469-3474

Dmitry Rodnyansky, Oksana Polyakova, Ruslan Abramov and Ivan Makarov

Digital Technologies in the Context of the Implementation of the Responsibility by Government Officials

pp. 3475-3478

Azat Albertovich Gafurov, Aleksandr Fedorovich Malyj and Ella Rolandovna Adamova

Management of Innovations in the Supply Chains of Russian Oil and Oil Products Taking Into Account Regional Structure

pp. 3479-3484

Beilin Igor Leonidovich

Economic Optimization of the Oil and Gas Companies Financing

pp. 3485-3496

Safiullin Lenar Nailevich, Bulatova Elvira Ildarovna, Fathutdinova Regina Andreevna and Surkova Sofia Mirgalimovna

Coalescing Filter for Separation of Water-Oil Emulsions

pp. 3497-3503

Dinar Dilshatovich Fazullin, Gennady Vitalievich Mavrin and Leysan Ildarovna Fazullina

Digital Spaces and Bi-Regional Interaction within the Paradigm of Scientific Cooperation

pp. 3504-3507

Rosa Iosifovna Sitdikova, Nataliya Yevgenjevna Tyurina and Liliia Djamilovna Iafizova

Mechanisms for Ensuring the Economic Security of the Banking Sector Based on Blockchain Technologies

pp. 3508-3512

Marat Rashitovich Safiullin, Leonid Alekseevich Elshin and Alia Aidarovna Abdukaeva

Blockchain as the Component of the Macro-Generating Cluster of the Sixth Technological Mode

pp. 3513-3518

Marat Rashitovich Safiullin, Mikhail Valerievich Savelichev, Leonid Alekseevich Elshin and Vadim Olegovich Moiseev

Combination of Myoware Muscle Sensor, Bluetooth Module and Analog Receiver

pp. 3519-3523

Dmitry Andreevich Artemyev and Ilsiyyar Ildarovna Bikmullina

Composition and Properties of Coolant Concentrate Obtained By a Dynamic Membrane

pp. 3524-3529

Dinar Dilshatovich Fazullin, Gennady Vitalievich Mavrin and Diana Aleksandrovna Yarovikova

Features of Lean Manufacturing in the Energy Sector

pp. 3530-3536

Badrieva R.R., Demyanova O.V. and Andreychenko I.S.

Identification of Bots in Social Networks based on Data Mining Technologies

pp. 3537-3541

Ilyas Idrisovich Ismagilov, Ajgul Ilsha. \ijert20\ijertv13n11_58.pdf tovna Sabirova, Dina Vladimirovna Kataseva and Alexey Sergeevich Katasev

Method for Image Processing

pp. 3542-3545

Lenar Ajratovich Galiullin and Rustam Asgatovich Valiev

Method for Optimal Route

pp. 3546-3550

Aleksey Nikolaevich Iliukhin and Lenar Ajratovich Galiullin

Method for Site Access Control

pp. 3551-3554

Emil Lutcerovich Khaziev and Lenar Ajratovich Galiullin

Method of Geodata Processing

pp. 3555-3558

Shamil Aktasovitch Khamadeev and Lenar Ajratovich Galiullin

Modification of Microfiltration Membranes with Ultraviolet Radiation to Separate Oil-In-Water Emulsions

pp. 3559-3563

Dinar Dilshatovich Fazullin and Gennady Vitalievich Mavrin

Method for Developing Unique Database Identifiers

pp. 3564-3567

Lenar Ajratovich Galiullin and Rustam Asgatovich Valiev

Perspective Evaluation of a Poultry-Breeding Enterprise Financial Resources Based on Seasonal Decomposition

pp. 3568-3574

Kadochnikova E.I, Sungatullina L.B., Agzamova R. R. and Abduazizova G. Sh

The Project of Creating an Expert Company for the Diagnosis of Gas, and Also Oil and Gas Pipelines Using Mps

pp. 3575-3578

Guzel Rafikovna Ganieva, Dinara Danilovna Iskhakova, Adel Evgenjevich Shammassov and Dmitri Sergeevitch Kostioukov

Emerging Technologies Integral Estimation Dynamic Model of the Company Financial Risks

pp. 3579-3584

Yakupova N. M., Kadochnikova E.I., Rafikova A. V. and Vasily I. Eremin

Management of Learning Companies: Problems and Prospects

pp. 3585-3588

Khanif Sharifzyanovich Mullakhmetov, Ruslan Duferovich Sadriev and Elvira Ructemovna Gafiyatullina

Neurofuzzy Model of Formation of Knowledge Bases for Selection of Geological and Technical Measures in Oil Fields

pp. 3589-3595

Oleg Yuryevich Panishev, Ekaterina Nikolaevna Ahmedshina, Dina Vladimirovna Kataseva, Igor Vyacheslavovich Anikin, Alexey Sergeevich Katasev, Amir Muratovich Akhmetvaleev and Arslan Valerievich Nasybullin

Neural Network Model for Detecting Network Scanning Attacks

pp. 3596-3600

Oleg Yuryevich Panishev, Artur Tagirovich Makridin, Alexey Sergeevich Katasev, Amir Muratovich Akhmetvaleev and Dina Vladimirovna Kataseva

Improvement of Repair Impact Efficiency During Technical Operation of Diesel Engines

pp. 3601-3604

Rinat Ralifovich Gainiev, Aleksey Yurevich Barykin, Rayaz Khalimovich Takhaviev and Damir Imamutdinovich Nuretdinov

Fuzzy Multi-Criterial Choice of Geological and Technical Measures

pp. 3605-3610

Oleg Yuryevich Panishev, Yuri Vladimirovich Davydov, Igor Vyacheslavovich Anikin, Dina Vladimirovna Kataseva, Alexey Sergeevich Katasev and Amir Muratovich Akhmetvaleev

Development of Application for Recognition of Object Groups in the Image

pp. 3611-3615

Ilnur Saitovich Miftahov, Larisa Yurievna Grudtsyna and Irina Yurievna Myshkina

The Technology of Collecting Initial Data for Constructing Models for Assessing the Functional State of a Person by Pupillary Response to Changes in Illumination

pp. 3616-3624

Oleg Yuryevich Panishev, Rufat Faig Ogly Babayev, Dmitriy Gennadievich Petrosyants, Alexey Sergeevich Katasev, Amir Muratovich Akhmetvaleev, Irina Vladislavovna Akhmetvaleeva and Dina Vladimirovna Kataseva

Engineering Aspect of Modern Concept of Professional Education of Artists and Designers in Academic Figure

pp. 3625-3630

Elena Vasilenko, Pavel Vasilenko, Natalya Saenko, Viacheslav Borysov, Svitlana Borysova and Iryna Prodan

Artificial Intelligence: A Field of Synthesis of Breakthrough Ideas and Patenting of Intellectual Property

pp. 3631-3640

Shegelman I. R, Shtykov A. S. and Vasilev A. S

Energy Saving In Heating Systems of Buildings and Structures

pp. 3641-3643

Panfilov Stepan Aleksandrovich, Kabanov Oleg Vladimirovich, Shnyakin Ivan Anatolyevich, Valery Fedorovich Danilov and Grigoryev Andrey Anatolievich

Technological Innovations for the Arctic and the Far North: Areas of Patenting Intellectual Property

pp. 3644-3650

Maslennikov E. I., Shegelman I. R., Shtykov A. S. and Vasilev A. S.

Features of the Reflection of Economic Issues by Russian Internet Media

pp. 3651-3653

Ramis Rassykhovich Gazizov and Murshida Khanafiyevna Bayraktar

Assessment of the Competitiveness of the Hotel Business in Republic of Uzbekistan

pp. 3654-3658

Djumaev Bobir Askarovich, Vladimir Anatolevich Rubtzov and Niyaz Minnahmatovich Biktimirov

Financial Potential and Tools for Commercialization of Biotechnology Projects in the Sustainable Development System

pp. 3659-3666

A. A. Kasatova, V.I. Vagizova and I.A. Kokh

The Research of the Bread Quality of High Nutritional Value Using Grain Mixtures

pp. 3667-3674

Zh.K. Nurgozhina, D.A. Shansharova, V. Sottnikova, A.M. Saidov and G.K. Yesseyeva

Model of Integrated Quality and Safety Management System for Collagen Production

pp. 3675-3684

Assemay T. Kazhymurat, Raushangul U. Uazhanova, Ulbala O. Tungyshbayeva and Dinara A. Tlevlesova

Energy-Saving Ventilation System for Sheep Premises

pp. 3685-3690

M.Zh. Issakhanov, N.B. Alibek, T.S. Dyusenbayev and A.S. Taldybayeva

Study of the Effect of cabbage juice (*Brassica Oleracea*), as a source of inhibition of microorganisms of the genus *Bacillus* in the preparation of whole grain wheat bread

pp. 3691-3698

L.Zh. Alashbayeva, D.A. Shansharova, H. Luděk, M.D. Kenzhekhojayev and N.V. Ivannikova

Effect of Proteolytic Enzymes on The Biological Degradability of Gelatin-Based Films

pp. 3699-3704

Bakyt B. Tyussypova, Sagdat M. Tazhibayeva, Kuanyshbek Musabekov, Yessengeldi Mussatay and Azymbek Kokanbaev

The Use of Probing Laser Systems in the Complex Safety Problems

pp. 3705-3709

S. A. Rudyka

Probability of Position and Motion Parameters Estimation for a Radio Beacon in Passive Search and Rescue Systems

pp. 3710-3717

Semen Yukhno, Yuriy Petrov and Stanislav Rudyka

Future Energy Security for Kazakhstan: A Case Study of Brazil

pp. 3718-3731

Hor Ka Wai Christopher, Fatima Kukeyeva, Malik Aугan, Kuralay Baizakova and Duman Zhekenov

Model of Developing the Availability of Engineers to Innovative Activity for High-Tech Industry

pp. 3732-3735

Angelina Olegovna Bagateeva and Guliya Nailevna Akhmetzyanova

Development of Manganese Master Alloy for Aluminum Alloys and the Technology of Its Application

pp. 3736-3740

Ainur Minnegayanovich Valiev, Lenar Rustamovich Kharisov, Dmitry Leonidovich Pankratov and Radik Nurgayazovich Gatin

Determination of Fiber Laser Cutting Parameters Taking Into Account the Distribution of the Laser Beam in the Material

pp. 3741-3745

Igor Petrovich Balabanov, Niyaz Rifkatevich Gabbasov and Olga Nikolaevna Balabanova

Kamaz Engine (R6 Series) Reliability Provision

pp. 3746-3750

Eduard Mukhamatzakievch Mukhametdinov, Irina Viktorovna Makarova, Larisa Mukhamatzakiyevna Gabsalikhova, Kapitonov Aleksandr Aleksandrovich and Hafizullin Ilnaz Shaukatovich

Search and Optimization of Factors to Improve Road Safety

pp. 3751-3756

Polina Aleksandrovna Buivol, Gulnara Anvarovna Iakupova, Irina Viktorovna Makarova and Eduard Mukhamatzakievch Mukhametdinov

Optimal Designing of the Rod Structure

pp. 3757-3760

Klyuev S.V., Klyuev A.V., Petrov N.I., Promahov V.V. and Klimenko V.A.

Introduction of Information Business Course in the Content of the Computer Science Program

pp. 3761-3771

Alzhanov I. A., Ismagambetova F. A., Abildinova G. M., Mubarakov A. M. and Alzhanov A. K.

The Barriers towards the Adoption of E-Wallet Payment System

pp. 3772-3777

Nur Izzati Mohamad Anuar, Nik Malini Nik Mahdi, Nik Alif Amri Nik Hashim, Siti Rohana Mohamad, Siti Afiqah Zainuddin, Nur Farahiah Azmi, & Wan Farha Wan Zulkiffli

Application of Phase Distortion Autocompensation to Improve the Spectral Characteristics of Signal Generators of UAV Radio Transmitters

pp. 3778-3782

Dmitry I. Surzhik, Gleb S. Vasilyev and Oleg R. Kuzichkin

Design and Implementation of Overcurrent Relay to Protect the Transmission Line

pp. 3783-3789

Mohammed A. Ibrahim, Waseem Kh. Ibrahim and Ali N. Hamoodi

Measure Theory of Premeasures and Measures with Extension

pp. 3790-3794

Hassan Hussien Ebrahim, Hind Fadhil Abbas and Slah Al Deen/SAMMARA

Solidarity Business Model for Micro-Businesses that Allows Economic Reactivation Due to COVID-19 in Colombia

pp. 3795-3798

MSc. Leydy J Hernández Viveros, MSc. Jennifer C Murcia Rodriguez and PhD. Danilo A. López Sarmiento

Performance Comparison and Visualization with Different Computational Softwares for Predicting the Reservoir Pressure on Oil Production

pp. 3799-3805

W. Z. W. A Muhamad, N. Alias, M. N. M. Ibrahim, H. F. S. Saipol and A. K. Junoh

Estimation of Voice Perturbation Measures Using Signal Processing Algorithms

pp. 3806-3813

V. Prarthana Karunaimathi, D. Gladis and D. Balakrishnan

The Effectiveness of the E-Portfolio Using the Students Led Conference Approach for Elementary School Students

pp. 3814-3818

Nafik, Prof. Dr. Mustaji, M.Pd. and Dr. Andi Mariono, M.Pd.

Development of Student Worksheets as Online English Learning Media at the Indonesian Vocational School

pp. 3819-3824

Nurul Iskandar, Mustaji and Miftakhul Jannah

Application of fuzzy synchronization in the NLOS UV communication system

pp. 3825-3829

G.S. Vasilyev, O.R. Kuzichkin, D.I. Surzhik, I.S. Konstantinov and S.A.Lazarev

Hierarchical Model for Conditioning Information Signals at the MANET Physical Level with Ultraviolet Channel

pp. 3830-3834

G.S. Vasilyev, O.R. Kuzichkin, D.I. Surzhik, I.S. Konstantinov and S.A.Lazarev

Fractal Manifold Method in Systems with Self-Organized Criticality

pp. 3835-3839

V.V. Vladimirov and E.V. Vladimirova

Building a Knowledge Base in Patented Technology and Equipment for Dispensing Various Types of Substances

pp. 3840-3848

Vasilev A. S, Shegelman I. R., Sukhanov Y. V., Galaktionov O. N., Lukashevich V. M., Kuznetsov A. V. and Krupko A. M.

On a solution to the "cheaters" and "consultants" problem within online educational service

pp. 3849-3854

Anton Anatolievich FINOGENOV, Natalia Sergeevna GILMANOVA and Svetlana Valentinovna VLADIMIROVA

A Comprehensive Review on the Influence of Equal Channel Angular Pressing Parameters on Magnesium Alloys

pp. 3855-3871

M.S. Salleh, A.A. Rahman, S.H.Yahaya, M.Y.Yuhazri and S. Akmal

A Generalised Fixed Point Theorem for Set Valued Presic Type Contractions in a Metric Space

pp. 3872-3876

Rajagopalan R

Ecolodge Design and Architectural Education: A New approach for Design Studios

pp. 3877-3892

Iman O. Gawad

Influence of the inconsistency of the geometric layout on the road accident rate in a stretch of road with mountainous topography in southern Colombia

pp. 3893-3898

Fernando Jove Wilches, Jorge Luis Argoty Burbano and Carlos Millán-Páramo

Comparative Study on Thermal Comfort of a HVAC System with Two and Four Airflow Inlet using CFD Analysis for Commercial Building

pp. 3899-3906

Moole Koti suryam and Godiganur.Sharanapp

Determination of Stresses and Displacements in Rigid Pavement Slabs, Through Finite Element Analysis

pp. 3907-3912

Fernando Jove Wilches, Carlos Millán-Páramo and Álvaro Rafael Caballero Guerrero

A Lane Centerline Recognition System Based on Improved High Efficiency Hough transform

pp. 3913-3918

Tao Peng, YoungMin Jang and ByeongWoo Kim

Modeling of Asphalt Pavement Considering the Application of Empirical and Mechanistic Design Methodologies

pp. 3919-3926

Fernando Jove Wilches, Álvaro Rafael Caballero Guerrero and Giancarlo Patrón Lambraño

Business Architecture Model in Strategic Information System Management for Effective Railway Supply Chain Perspective

pp. 3927-3933

Mailasan Jayakrishnan, Abdul Karim Mohamad and Mokhtar Mohd Yusof

Modelling of Asphalt Pavement Structures for Different Design Conditions on Roads in Northern Colombia

pp. 3934-3942

Fernando Jove Wilches, Giancarlo Patrón Lambraño and Carlos Millán-Páramo

Case Study: Analysis of Dropout, Repetition and Academic Risk by Higher Education Students at the Universidad Distrital Francisco Jose de Caldas

pp. 3943-3949

Harvey Gomez Castillo, Holman Montiel Ariza and Miguel Perez Pereira

Truss Optimization with Natural Frequency Constraints Using Modified Social Engineering Optimizer

pp. 3950-3963

Carlos Millán-Páramo, Euriel Millán-Romero and Fernando Jove Wilches

Method and System of Pre-Sowing Microwave Treatment of Agricultural Crop Seeds

pp. 3964-3969

A.V. Kovalev, O.B. Spiridonov, I.E. Lysenko and O.A. Ezhova

Modelling of rigid pavements in road projects in northern Colombia, using the Finite Element method

pp. 3970-3976

Fernando Jove Wilches, Carlos Millán-Páramo and Álvaro Rafael Caballero Guerrero

Promising Information Technologies for Tax Purposes: International Trends in Software for Auditors

pp. 3977-3986

Larisa Petrovna Grundel, Nina Ilinishna Malis, Irina Aleksandrovna Zhuravleva, Nadezda Petrovna Melnikova and Olga Valentinovna Mandroshchenko

Optimization of Cost and CO2 Emission in Reinforced Concrete Footings Using a Metaheuristic Algorithm: A parametric study

pp. 3987-3991

Carlos Millán-Páramo, Euriel Millán-Romero and Fernando Jove Wilches

GAN based Augmentation for Improving Anomaly Detection Accuracy in Host-based Intrusion Detection Systems

pp. 3992-4001

Kangseok Kim

A Methodology for Tuning Cascade PI Controllers for Power Electronics Converters

pp. 4002-4008

Nicolás Muñoz Galeano, Jesús María López Lezama and Juan Bernardo Cano Quintero

Bioengineering in a Poultry Facility in Northern Colombia

pp. 4009-4015

Carlos Millán-Páramo, Euriel Millán-Romero and Fernando Jove Wilches

Efforts to Improve the Financial Performance of Manufacturing Companies Based on Environmental Performance, Corporate Social Responsibility and Intellectual Capital

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Abstract

Increased industrial activity must have an impact on the economic and social values of a country. The economic value will increase with the presence of an industry which is marked by the economic growth of a country. Social value will appear with the impact on the environment due to the existence of the industry. This study aims to determine the impact of environmental performance, corporate responsibility and intellectual capital on financial performance in manufacturing companies listed on the Indonesia Stock Exchange for the period 2016-2018. The study used a population of manufacturing companies listed on the IDX for the 2016-2018 period. Of the existing manufacturing companies, there are 24 companies that meet these criteria. The research sample was 24 companies multiplied by 3 periods, namely 2016-2018, so that a sample of 72 was obtained. To determine the impact of the independent variable on the dependent variable, it was processed using multiple linear regression. The results showed that environmental performance had a positive and significant effect on financial performance. Corporate social responsibility has a positive effect on financial performance, while intellectual capital has no impact on financial performance in manufacturing companies listed on the IDX 2016-2018.

Keywords: environmental performance; corporate social responsibility; intellectual capital; the company's financial performance.

INTRODUCTION

The manufacturing sector is still the largest contributor to the national economy and Indonesia's gross domestic product. This can be seen from the large contribution that was achieved, namely 10.60 percent for the base metal industry, the food and beverage industry 9.49 percent, and the transportation equipment industry 5.63 percent, among others, through an increase in the added value of domestic raw materials. The industrial sector is also the largest contributor to taxes and excise. Data on the realization of tax revenues from the industrial sector until the third quarter of 2017 reached Rp.224.95 trillion or grew 16.63 percent compared to the same period in the previous year reported by the Directorate General of Taxes, Ministry of Finance (Ezez 2018/b/).

The increasing contribution of the industrial sector to Indonesia's economic growth will undoubtedly have an impact on the surrounding environment where the industry is located. The impact of development is definitely there. Development in all sectors must have an impact on the existing environment, including development in the industrial sector. Indonesia is a semi-industrial country because it has a very high growth rate. Therefore, the development of this industrial sector will also produce large industrial waste which has not received as much attention from the government and industry players. In fact, the impact of industrial waste is very dangerous if it is not managed properly. Often in the media, the impact of industrial waste is conveyed in the form of disease outbreaks that attack residents around industrial environments. As an industrial player, he must be aware of the impact caused by the industry. Industrial waste is a waste product that results from the production process and household activities. Not only from these two things, it turns out that natural waste can also produce waste, the presence of this type of waste is usually not desired by the environment because it has no economic value (<https://nebraska.co.id/blog/view/dampak-limbah-terhadap-lingkungan-sekitar> 2018/).

Companies of any type are still required to continue to improve performance, especially financial performance. Parties who demand performance can come from external and internal companies who have a strong interest in the existence of the company. Shareholders hope that the company can provide returns on the funds that have been invested. Internal parties want financial performance to be continuously improved. Currently, manufacturing companies listed on the Indonesia Stock Exchange are divided into the basic and chemical industry sector, various industrial sectors and the consumer goods industry sector. The basic and chemical industry sector consists of: the cement sub-sector there are 6 companies, the ceramic, porcelain and glass sub-sector there are 7 companies, the metal sub-sector and the like there are 15 companies, the chemical sub-sector there are 13 companies, the plastics and packaging sub-sector there are 11 companies, there are 5 companies in the animal feed sub-sector, 2 companies in the wood industry, 9 in the pulp and paper sub-sector, and 2 in the other sub-sector. The next sector is the various industrial sectors. This multifarious industry sector has several sub-sectors, including: the machinery and heavy equipment sub-sector with 4 companies, the automotive and

components sub-sector with 13 companies, the textile and garment sub-sector with 19 companies, the footwear sub-sector 2 companies, and the cable sector 6 companies, the electronics sub-sector 2 companies, the industrial and consumer goods sub-sector 20 companies, the tobacco factory sub-sector 4 companies, the pharmaceutical sub-sector 4 companies, the cosmetics sub-sector and household goods by 7 companies, the household appliances sub-sector 4 companies, and other subsectors 1 company. A total of 11 companies are in the framework of IPO and 3 companies are in delisting positions (Ezez 2018/a).

A total of 156 manufacturing companies listed on the IDX, 11 IPO companies and 3 delisted companies. All companies listed on the IDX must continue to improve their financial performance in order to survive and continue to contribute to the nation and state. Many factors can improve a company's financial performance. There are several points that can improve the company's financial performance, including: environmental performance, corporate social responsibility.

In addition to being demanded for financial performance, companies in the industrial sector are also demanded by the public and the government that the impact of the industry they manage must be accounted for. Industrial companies will definitely have an impact on the surrounding environment where the company operates. Good industrial waste management and providing information to the public and complying with government regulations on the environment are mandatory for companies in the industrial sector today. With the existence of Law Number 32 of 2009 concerning Environmental Protection and Management which is a law issued by the government to address the impact of industry on the environment. The government has issued Law 32 of 2009 concerning Environmental Protection and Management which aims to protect the Republic of Indonesia from environmental pollution and / or damage. Realizing sustainable development to anticipate global environmental issues. In addition, the Ministry of Environment (KLH) has also issued a program called the Company Performance Rating Program in Environmental Management (PROPER). This program was issued as a form of encouragement for companies in environmental management. This action aims to make industrial sector companies not only pay attention to profits but also pay attention to the surrounding environment.

Research that reveals the relationship between environmental performance and corporate financial performance has had mixed and controversial results. Research whose results have a positive relationship between environmental performance and financial performance include: (Al-Tuwaijri, Christensen, eta Hughes 2004/), (Elsayed eta Paton 2005/), (Nakao et al. 2007/), (Almilia eta Wijayanto 2007/), (Tjahyono 2009/), (Iwata eta Okada 2011/), (Nurhuda eta Suwarti 2011/), (Nurleli eta Faisal 2013/), (Fitriani 2013/), (Albertini 2013/), (Iriyanto eta Nugroho 2014/), (Rosyid 2015/), (Haholongan 2016/), (Rizkan, Islahuddin, eta Nadirsyah 2017/), (Manrique eta Martí-Ballester 2017/), (Hardiyansah eta Agustini 2020/).

Meanwhile, the research which shows that environmental performance does not have a significant impact includes: (Pratiwi eta Setyoningsih 2010/), (Astuti, Anisykurlillah, eta

Murni 2014/), (Vivianita eta Nafasati 2016/), (Setyaningsih eta Asyik 2016/), (Hasanah eta Destalia 2017/), (Lingga eta Suaryana 2017/).

Apart from being pressured by shareholders to continue to improve financial performance so that the price per share continues to increase, on the other hand, the public is often demanded for its social performance. Corporate social responsibility is the company's action so that the company not only reaps profits but on the other hand is also obliged to pay attention to the surrounding environment in the form of social responsibility (Pratiwi eta Setyoningsih 2010/). This concept demands company activities that can have an impact on society. Thus, companies need to make transparent information about social and environmental impacts due to the company's industrial activities (Deegan 2002/).

Several studies on the relationship between corporate social responsibility and corporate performance with positive results include: (Sari eta Sinambela 2008/), (Pratiwi eta Setyoningsih 2010/), (Nurhuda eta Suwarti 2011/), (Shafariani 2013/), (Hamdani 2014/), (Darmawati 2015/), (Rosyid 2015/), (Swastika eta Aryati 2016/), (Suciwati, Pradnyan, eta Ardina 2016/), (Gantino 2016/), (Yulianingtyas 2016/), (Pramukti eta Buana 2019/). Research whose results state that corporate social responsibility has no impact on the company's financial performance includes: (Kusuma eta Syafruddin 2014/), (Qomariah 2015/), (Sudaryanti eta Riana 2017/), (Parengkuan 2017/).

Intellectual capital is an intangible asset owned by a company that is not explicitly listed on the company's balance sheet, but has a positive impact on company performance. The company's intangible assets such as intellectual capital have the potential to increase the added value of the company. In Indonesia, intellectual capital is regulated in PSAK No. 19 (revised 2000) concerning Intangible Assets. The measure of intellectual capital uses the VAIC (Value Added Intellectual Coefficient). This VAIC is an indirect measurement with a measure to assess the efficiency of added value as a result of the company's intellectual ability. The components of VAIC include physical capital (VACA), human capital (VAHU), and structural capital (STVA) (Ihyaul 2009/).

Several studies that link intellectual capital with financial performance include: (W eta Firmansyah 2012/), (Agustina, Yuniarta, eta Sinarwati 2015/), (Habibah eta Riharjo 2016/), (Nurhayati 2017/), (Dwie Lestari, Paramu, eta Sukarno 2017/), (Haryanto eta Henny 2013/), (Kurniawan 2013/), (Gozali eta Hatane 2014/), (Lestari 2017/), (Khasanah 2016/), (Ozkan, Cakan, eta Kayacan 2017/), (Iskandar, Azis, eta Rahmat 2019/), (Sumani eta Suryaningsih 2020/), which states that intellectual capital can improve the company's financial performance. Several studies that do not support that intellectual capital have no effect on financial performance include: (Andriana 2014/), (Dženopoljac, Janošević, eta Bontis 2016/).

From the explanation related to the issue of the environment due to industrial activities of industrial companies operating in Indonesia for the 2016-2018 period, as well as how industrial companies care for the community related to corporate social responsibility, as well

as the relationship between intellectual capital owned by the company associated with the company's financial performance, then the hypothesis proposed in this study are:

- H1: Environmental performance can improve the company's financial performance.
- H2: Corporate social responsibility has an impact on the company's financial performance.
- H3: Intellectual capital can improve the company's financial performance.

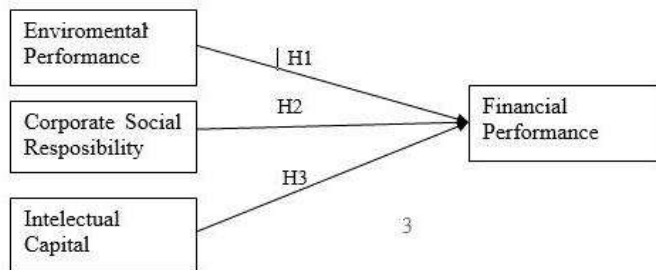


Figure 1. Research Conceptual Framework

MATERIAL AND METHODS

The design of this research is explanatory research where this research is an explanatory study that will explain the causal relationship between the research variables and hypothesis testing based on a theory that has been previously formulated using a quantitative approach (Sugiyono 2013/). As for the independent variables in this research is environmental performance company, corporate social responsibility and intellectual capital, while the dependent variable is the company's financial performance. The object of research is manufacturing companies listed on the Indonesia Stock Exchange in 2016-2018. Population as a generalization area consisting of objects / subjects that have certain quantities and characteristics (Ghozali 2011/). The population of this research is manufacturing companies listed on the IDX in 2016-2018, totaling 161 companies, while manufacturing companies participating in the company performance appraisal program (PROPER) of the Ministry of Environment There are 24 companies living in the Republic of Indonesia during 2016 - 2018, so the number of 24 companies is used as the sample.

Table 1. Details of Research Sample Determination

No.	Criteria	Number of Companies
	Manufacturing companies listed on the IDX in 2018	161
1	Manufacturing companies listed on the IDX but not consecutive during 2016 - 2018	(12)
	Manufacturing companies listed on the IDX in a row during 2016 - 2018	149
2	Manufacturing companies that do not participate in the company performance appraisal program (PROPER) of the Ministry of Environment of the Republic of Indonesia during 2016 - 2018	(125)
	Manufacturing companies participating in the company performance appraisal program (PROPER) of the Ministry of Environment of the Republic of Indonesia during 2016 - 2018	24
3	Companies that do not have complete data	(0)
	Companies that have complete data	
Research Samples		24

Based on the sampling criteria, there were 24 manufacturing companies that met the requirements to be the research sample. So, for the purposes of data analysis using 24 companies with a study period of 2016 - 2018 or 3 years. The research data is in the form of pooled data and the number of observations becomes $24 \times 3 = 72$ ($n = 72$).

The company's environmental performance is the company's performance in creating an environment that can provide benefits to the community. PROPER is an environmental performance appraisal using a color indicator starting with gold for the company with the best environmental assessment, followed by green, blue, minus blue, red, minus red and black for the worst environmental performance assessment. The

financial performance variable is a measure of the company's achievement in monetary units. The indicator used is a measure of profitability, namely return on assets (ROA), which describes the profits a company gets with its assets. ROA is a ratio that shows the results of the total assets used in the company. The greater the ROA shows the better performance, because the rate of return is greater. For the corporate social responsibility variable, the indicator used is the CSRDI approach. Basically using a dichotomous approach, where each CSR item in the assessment instrument is given a value of 1 if disclosed, and a value of 0 if not disclosed. Next, the scores of each item are added up to get the overall score for each company. Indicators of intellectual capital (VAIC) are physical capital (VACA), human capital (VAHU), and structural capital (STVA) (Khasanah 2016/). Data analysis used multiple linear regression analysis (Ghozali 2011/).

RESULTS AND DISCUSSION

Descriptive statistics

The variables used in this study are environmental performance (X1), corporate social responsibility (X2), intellectual capital (X3), and company financial performance (Y). Descriptive statistical data for each variable used in this study are presented in Table 2.

Table 2. Results of Research Variable Descriptive Statistics

Variable	Minimum	Maximum	Mean	Std. Deviation
X1	2,000	4,000	2,861	0,512
X2	0,241	0,456	0,339	0,069
X3	-1,905	4,855	1,264	1,162
Y	-17,610	53,000	6,748	11,049

Table 2 shows that the environmental performance variable (X1) has an average of 2.861. Environmental performance has a minimum value of 2, which is a company with environmental performance in the red category, while the maximum value of 4 is a company with environmental performance in the green category. Corporate social responsibility (X2) has an average of 0.339. Corporate social responsibility has a minimum value of 0.241, which is the corporate social responsibility of several companies, while the maximum value of 0.461 is the corporate social responsibility of PT. Multi Bintang Indonesia Tbk. (MLBI) 2016 and 2017. Disclosure of corporate social responsibility is carried out by assessing the corporate social responsibility index (CSR_i), in this case the higher the value of the corporate social responsibility index, the better the corporate social responsibility. Intellectual capital (X3) has an average of

1,264. Intellectual capital has a minimum value of -1.905, which is the intellectual capital of the company PT. Bentoel International Investama Tbk. (RMBA) in 2016, while the maximum value of 4,858 is the intellectual capital of the company PT. Multi Bintang Indonesia Tbk. (MLBI) in 2016. The company's financial performance (Y) as measured by the proxy of Return on Assets (ROA) has an average of 6.75%. The company's financial performance has a minimum value of -17.61, which is the company's financial performance at PT. Martina Berto Tbk. (MBTO) in 2018, while the maximum value of 53.00 is the Company's Financial Performance at PT. Multi Bintang Indonesia Tbk. (MLBI) in 2017.

Classical Assumption Test Results

Multicollinearity means that there is an intercorrelation between independent variables which indicates that there is more than one significant linear relationship. If the correlation coefficient of the variable in question is located outside the acceptance limits then the correlation coefficient is significant and multicollinearity occurs. If the correlation coefficient lies within the acceptance limits, the correlation coefficient is insignificant and there is no multicollinearity.

Table 3. Collinearity Statistic

Variable	VIF	Information
X1	1,291	Non Multicollinearity
X2	1,323	Non Multicollinearity
X3	1,064	Non Multicollinearity

Based on the results of the Collinearity Statistic analysis, it can be concluded that multicollinearity does not occur, because the VIF value is 10, meaning that there is no linear relationship between the independent variables used in the regression model.

Heteroscedasticity test is conducted to test whether in a regression model there is an inequality of variance from one residual observation to another. Detection of the presence or absence of heteroscedasticity can be done by looking at the presence or absence of a certain pattern on the scatterplot graph between SRESID and ZPRED. The results of the heteroscedasticity test show that there is no clear pattern, and the dots spread above and below the number 0, so there is no heteroscedasticity.

Autocorrelation test is conducted to test the assumption that the data must be independent in the sense that the data is in the previous period or in the period after. Autocorrelation testing is done by testing the Durbin Watson statistical test, where the magnitude of Durbin Watson's statistical value is denoted by d or DW. The test is done by comparing the Durbin-Watson test value with the Durbin-Watson test table. The Durbin-Watson table value for n = 72 and k = 3 at the 5% level of significance obtained a value of 1.525 and a value of

1.703. The test results can be seen in Appendix 3, the DW value is 2.224, which means that it is located between $dU < d < 4 - dU$ ($1.703 < 2,224 < 2,297$). This means that the regression model above does not have an autocorrelation problem.

Data normality testing is used to determine whether the data is normally distributed or not. Data normality is detected by looking at the distribution of data (points) on the diagonal axis of the normal P-Plot Of Regression Standardized Residual graph. With this method, the data can be said to be normally distributed if the data spreads around the diagonal line and follows the direction of the diagonal line of the normal graph P-Plot Of Regression Standardized Residual (Santoso, 2012). The results of the normality test on the regression model show

that the points spread around the diagonal line, and the distribution follows the direction of the diagonal line. Then the regression model is suitable for use because it has met the normality assumption.

Results of Multiple Linear Regression Analysis

Multiple linear regression testing is useful for knowing the effect of independent variables consisting of environmental performance (X1), corporate social responsibility (X2), and intellectual capital (X3) on the dependent variable, namely the company's financial performance (Y). The results of bias testing are shown in Table 4.

Table 4. Results of Multiple Linear Regression Analysis

Variable	Regression Coefficient	t-count	t-table	Significance	Information
Constant	-35,446	-4,924	1,980	0,000	-
X1	5,852	2,480	1,980	0,016	Ha1 accepted
X2	72,209	4,050	1,980	0,000	Ha2 accepted
X3	0,784	0,830	1,980	0,409	Ha3 rejected
				R	= 0,609
				R Square	= 0,370
				Standart of Error	= 8,959
				F _{count}	= 13,334
				Fsig	= 0,000
				N	= 72

Multiple Determination Coefficient Analysis (R2)

The multiple coefficient of determination (R2) is intended to determine the size of the contribution of the independent variable to the dependent variable. The coefficient of determination lies between 0 and 1. If R square or R2 = 1, then the regression line of the model contributes 100% to the change in the dependent variable. If R2 = 0, then the model cannot influence or contribute to changes in the dependent variable. The fit of the model gets better the closer it is to unity. Based on the results of the analysis which can be seen in Table 4, the results of the multiple coefficient of determination (R2) are 0.370, this means that 37.0% of the variation in changes in corporate financial performance is influenced by environmental performance variables, corporate social responsibility, and intellectual capital while the remaining 63% is caused by other factors that are not included in the regression equation created.

DISCUSSION

Effect of Environmental Performance on Company Financial Performance

The results of statistical analysis show that the environmental performance variable (X1) has a positive and significant influence on the company's financial performance with a beta coefficient value of 5.852 and the t value is 2.480 where the significance value (P) < 0.05 is 0.016. Statistically, the positive beta coefficient value indicates a unidirectional influence, which means that the greater the value of environmental performance, the greater the company's financial performance. So that it is found statistically significant evidence that the level of environmental performance has a positive effect on the company's financial performance (H1 accepted). Environmental performance is the performance of a company that cares about the surrounding environment. Environmental performance in manufacturing companies reflects the company's performance in creating a good environment. The government through the Ministry of Environment launched a

company performance appraisal program (PROPER) which is closely related to the dissemination of information on the compliance performance of each company to all stakeholders on a national scale. Companies that have a high level of environmental performance will be responded positively by investors, increasing public trust as well as enhancing the company's image in the eyes of people who will buy company products or invest in company operations through investment. These various conditions will certainly encourage an increase in company sales which will have an impact on the company's profitability and better financial performance.

The Effect of Corporate Social Responsibility on Corporate Financial Performance

The results of the calculation show that the variable corporate social responsibility (X2) has a positive and significant effect on the company's financial performance with a beta coefficient value of 72.209 and the t value is 4.050 where the significance value (P) <0.05 is 0.000. Statistically, the positive beta coefficient value shows a unidirectional influence, which means that the greater the social responsibility of the company, the greater the company's financial performance. So that it is found statistically significant evidence that the amount of CSR has a positive effect on the Company's Financial Performance (H2 accepted). Corporate Social Responsibility (CSR) is a form of corporate responsibility to the community for the company's operational activities, which is conveyed in the company's annual report. The more social and environmental information delivered by a company, the more it will improve the company's image. Investors will tend to invest in companies that have a good image, so that it has an impact on high consumer loyalty to the company's products. Thus in the long term the company's sales will improve so that its profitability will also increase. This increase in profitability shows that the company's financial performance is getting better.

The Influence of Intellectual Capital on Company Financial Performance

The results of the analysis show that the intellectual capital variable (X3) has a positive but insignificant effect on the Company's financial performance with a beta coefficient value of 0.784 and the t value is 0.830 where the significance value (P) > 0.05 is 0.409. Statistically, the positive beta coefficient value shows a unidirectional but insignificant influence, meaning that the greater the intellectual capital, the lower the company's financial performance. So that it is found statistically insignificant evidence that the amount of intellectual capital has no effect on the company's financial performance (H3 rejected). The regression test results show that the intellectual capital variable has a positive but insignificant effect on the company's financial performance with a regression coefficient of 0.784. This means that greater intellectual capital is not a factor that affects the company's financial performance. Intellectual capital is an intangible asset with the ability to provide value to companies and communities including patents, intellectual property rights,

copyrights, and franchises. Intellectual capital (IC) can be defined as company resources that are knowledge-based and in the form of intangible assets that are used to produce high-value assets and provide future economic benefits for the company. Intellectual capital is divided into three components, namely: physical capital, human capital (HU), and structural capital (SC). Physical capital shows a harmonious relationship with its partners, both from suppliers, customers, government, and the surrounding community.

CONCLUSIONS AND RECOMMENDATIONS

Based on the descriptions that have been disclosed in the discussion, several conclusions can be drawn as answers to the main problems raised in this study, namely: environmental performance has a positive and significant effect on the company's financial performance. Corporate social responsibility has a positive and significant effect on the company's financial performance. Intellectual Capital does not have a significant effect on the company's financial performance.

Referring to the results of the conclusions and discussion, several suggestions can be made as follows: the results prove that environmental performance and CSR disclosure have a significant effect on the company's financial performance. Therefore, it is hoped that manufacturing companies listed on the IDX will always strive to improve the company's ability to meet various requirements in environmental performance and increase disclosure of corporate social responsibility, so that the company will have a positive image. In further research, it is expected to use other variables such as company size, leverage, good corporate governance / GCG, and others as well as increase the research period to find out more about the factors that affect the company's financial performance.

REFERENCE

- Agustina, Wahyuni, Gede Adi Yuniarta, et al Ni Kadek Sinarwati. 2015/. «Pengaruh Intellectual Capital, Corporate Governance dan Corporate Social Responsibility Terhadap Kinerja Keuangan». *e-Journal Akuntansi Universitas Pendidikan Ganesha* 3(1):1–11.
- Al-Tuwaijri, Sulaiman A., Theodore E. Christensen, et al K. E. Hughes. 2004/. «The relations among environmental disclosure, environmental performance, and economic performance: A simultaneous equations approach». *Accounting, Organizations and Society* 29(5–6):447–71.
- Albertini, Elisabeth. 2013/. «Does Environmental Management Improve Financial Performance? A Meta-Analytical Review». *Organization and Environment* 26(4):431–57.
- Almilia, Luciana Spica, et al Dwi Wijayanto. 2007/. «PENGARUH ENVIRONMENTAL PERFORMANCE DAN ENVIRONMENTAL DISCLOSURE TERHADAP ECONOMIC PERFORMANCE». in *Proceedings The 1st Accounting Conference*.

- Andriana, Denny. 2014/. «Pengaruh Intellectual Capital Terhadap Kinerja Keuangan Dan Pertumbuhan Perusahaan». *Jurnal Riset Akuntansi dan Keuangan* 2(1):251–60.
- Astuti, Fitria Puji, Indah Anisykurlillah, eta Henny Murtni. 2014/. «Pengaruh Kinerja Lingkungan dan Kepemilikan Asing Terhadap Kinerja Keuangan». *Accounting Analysis Journal* 3(4):493–500.
- Darmawati, Deni. 2015/. «Pengaruh Tanggung Jawab Sosial Perusahaan Terhadap Kinerja Dan Risiko Perbankan Di Indonesia». *Finance and Banking Journal* 17(1):83–97.
- Deegan, C. 2002/. «Introduction: the legitimising effect of social and environmental disclosures -a theoretical foundation». *Accounting, Auditing & Accountability* 15(3):282–311.
- Dwie Lestari, Santi, Hadi Paramu, eta Hari Sukarno. 2017/. «Pengaruh Intellectual Capital Terhadap Kinerja Keuangan Perbankan Syari'Ah Di Indonesia». *EKUITAS (Jurnal Ekonomi dan Keuangan)* 20(3):346.
- Dženopoljac, Vladimir, Stevo Janošević, eta Nick Bontis. 2016/. «Intellectual capital and financial performance in the Serbian ICT industry». *Journal of Intellectual Capital* 17(2):373–96.
- Elsayed, Khaled, eta David Paton. 2005/. «The impact of environmental performance on firm performance: Static and dynamic panel data evidence». *Structural Change and Economic Dynamics* 16(3 SPEC. ISS.):395–412.
- Ezez. 2018/a/. «<https://www.eddyelly.com/2019/01/daftar-perusahaan-manufaktur-tahun-2018.html>».
- Ezez. 2018/b/. «<https://www.kemenperin.go.id/artikel/18609/Sektor-Sektor-Manufaktur-Andalan-Tahun-2018>».
- Fitriani, Anis. 2013/. «PENGARUH KINERJA LINGKUNGAN DAN BIAYA LINGKUNGAN TERHADAP KINERJA KEUANGAN PADA BUMN». *Jurnal Ilmu Manajemen* 1(1):137–48.
- Gantino, Rilla. 2016/. «Pengaruh Corporate Social Responsibility Terhadap Kinerja Keuangan Perusahaan Manufaktur yang Terdaftar di Bursa Efek Indonesia periode 2008-2014». *Jurnal Dinamika Akuntansi dan Bisnis* 3(2):19–32.
- Ghozali, Imam. 2011/. *Aplikasi Analisis Multivariate dengan Program SPSS*. Semarang: BP Universitas Diponegoro.
- Gozali, Adrian, eta Saerce Elyse Hatane. 2014/. «Pengaruh Intellectual Capital Terhadap Kinerja Keuangan Dan Nilai Perusahaan Khususnya Di Industri Keuangan Dan Industri Pertambangan Yang Terdaftar Di Bursa Efek Indonesia Tahun 2008 – 2012». *Business Accounting Review* 2(2):208–17.
- Habibah, Binti Nur, eta Ikhsan Budi Riharjo. 2016/. «Pengaruh Intellectual Terhadap Kinerja Keuangan Pada Perusahaan Manufaktur». *Jurnal Ilmu Dan Riset Akuntansi* 5(Ic):1–16.
- Haholongan, Rutinaias. 2016/. «KINERJA LINGKUNGAN DAN KINERJA EKONOMI». *Jurnal Ekonomi dan Bisnis* 19(3):413–23.
- Hamdani, Mailani. 2014/. «Hubungan Pengungkapan Corporate Social Responsibility (CSR) Terhadap Kinerja Keuangan dan Harga Saham Pada Perusahaan LQ45». *Jurnal Organisasi dan Manajemen* 10:27–36.
- Hardiyansah, Mohammad, eta Aisa Tri Agustini. 2020/. «Analysis of carbon emissions disclosure and firm value: Type of industry as a moderating model». *International Journal of Scientific and Technology Research* 9(2):1125–32.
- Haryanto, Melinda, eta Henny. 2013/. «Pengaruh Intellectual Capital Terhadap Kinerja Keuangan Dan Nilai Pasar Perusahaan». *Jurnal Manajemen Maranatha* 12(2):133–48.
- Hasanah, Jamingatun, eta Mediya Destalia. 2017/. «PENGARUH PENGUNGKAPAN BIAYA LINGKUNGAN SESUAI PSAK 33 DAN PERATURAN PEMERINTAH NOMOR 78 TAHUN 2010 TERHADAP KINERJA KEUANGAN (Studi Pada Perusahaan Pertambangan yang Terdaftar di Bursa Efek Indonesia Periode 2013-2015)». *Journal of Business Administration* 1(2):149–57.
- <https://nebraska.co.id/blog/view/dampak-limbah-terhadap-lingkungan-sekitar>. 2018/. «Dampak Industri Terhadap Lingkungan».
- Ihyaul, Ulum. 2009/. *Intellectual Capital: Konsep dan Kajian Empiris*. Yogyakarta: Graha Ilmu.
- Iriyanto, Felecia Novita, eta Paskah Ika Nugroho. 2014/. «PENGARUH KINERJA LINGKUNGAN TERHADAP PRAKTIK PENGUNGKAPAN SUSTAINABILITY REPORT dan KINERJA EKONOMI». *Dinamika Akuntansi, Keuangan dan Perbankan* 3(1):46–57.
- Iskandar, Rusdiah, Musdalifah Azis, eta Nur Rahmat. 2019/. «Vaic mediated by financial performance and gcg increase stock prices». *International Journal of Scientific and Technology Research* 8(12):164–68.
- Iwata, Hiroki, eta Keisuke Okada. 2011/. «How does environmental performance affect financial performance? Evidence from Japanese manufacturing firms». *Ecological Economics* 70(9):1691–1700.
- Khasanah, Anita Nur. 2016/. «Jurnal Nominal / Volume V Nomor 1 / Tahun 2016 Pengaruh Intelektual Capital dan Islamicity Performance Index Terhadap Kinerja Keuangan Perbankan Syariah di Indonesia». *Jurnal Nominal* V(6):1–18.
- Kurniawan, Indra Suyoto. 2013/. «Ntellectual Capital Terhadap Kinerja Keuangan Perusahaan Publik Di Indonesia». *Jurnal Keuangan dan Perbankan* 17(1):21–35.
- Kusuma, Destia, eta Muchamad Syafruddin. 2014/. «Analisis Pengaruh Corporate Social Responsibility Terhadap

- Kinerja Keuangan Perusahaan Dengan Manajemen Laba Sebagai Variabel Pemoderasi». *DIPONEGORO JOURNAL OF ACCOUNTING* 3(1):52–64.
- Lestari, Henny Setyo. 2017/. «Pengaruh Intellectual Capital Terhadap Kinerja Perusahaan Asuransi Di Indonesia». *Jurnal Manajemen* 21(3):491.
- Lingga, Winayaka, et al. I. Gusti Ngurah Agung Suaryana. 2017/. «LINGKUNGAN PADA NILAI PERUSAHAAN». *E-Jurnal Akuntansi* 20(2):1419–45.
- Manrique, Sergio, et al. Carmen Pilar Martí-Ballester. 2017/. «Analyzing the effect of corporate environmental performance on corporate financial performance in developed and developing countries». *Sustainability (Switzerland)* 9(11).
- Nakao, Yuriko, Akihiro Amano, Kanichiro Matsumura, Kiminori Genba, et al. Makiko Nakano. 2007/. «Relationship between environmental performance and financial performance: An empirical analysis of Japanese corporations». *Business Strategy and the Environment* 16(2):106–18.
- Nurhayati, Siti. 2017/. «Analisa Pengaruh Intellectual Capital Terhadap Kinerja Pasar Dan Kinerja Keuangan Pada Perusahaan Lq45 Yang Terdaftar Di Bursa Efek Indonesia Periode Tahun 2010-2013». *Jurnal ASET (Akuntansi Riset)* 9(1):133.
- Nurhuda, Adhita Setya, et al. Titiek Suwanti. 2011/. «ANALISIS PENGARUH CORPORATE SOCIAL RESPONSIBILITY, INTELLECTUAL CAPITAL, DAN KINERJA LINGKUNGAN TERHADAP KINERJA KEUANGAN PERUSAHAAN MANUFAKTUR YANG TERDAFTAR DI BURSA EFEK INDONESIA». Or. 978–79 in *Prosiding Seminar Nasional Multi Disiplin Ilmu & Call For Papers Unisbank (SENDI_U)*. Semarang.
- Nurleli, et al. Faisal. 2013/. «Pengaruh Pengungkapan Informasi Lingkungan Terhadap Kinerja Keuangan». 31–54.
- Ozkan, Nasif, Sinan Cakan, et al. Murad Kayacan. 2017/. «Intellectual capital and financial performance: A study of the Turkish Banking Sector». *Borsa Istanbul Review* 17(3):190–98.
- Parengkuan, Winnie. 2017/. «Pengaruh Corporate Social Responsibility(Csr) Terhadap Kinerja Keuangan Perusahaan Manufaktur Yang Terdaftar Di Bursa Efek Indonesia Melalui Pojok Bursa Feb Â€“ Unsrat». *Jurnal Riset Ekonomi, Manajemen, Bisnis dan Akuntansi* 5(2):564–71.
- Pramukti, Andika, et al. Andika Prawira Buana. 2019/. «Pengungkapan Tanggungjawab Sosial dan Kinerja Keuangan». *Owner* 3(2):301.
- Pratiwi, Monica Weni, et al. Susi Setyoningsih. 2010/. «PENGARUH KINERJA LINGKUNGAN TERHADAP NILAI PERUSAHAAN DENGAN CORPORATE SOCIAL RESPONSIBILITY DISCLOSURE SEBAGAI VARIABEL INTERVENING».
- Qomariah, Nurul. 2015/. «The Effect of Corporate Social Responsibility, Size, and Profitability Toward On the Value of Corporate». *Journal of Business and Management* 17(2):25–30.
- Rizkan, Mirza, Islahuddin, et al. Nadirsyah. 2017/. «PENGARUH ENVIRONMENTAL PERFORMANCE DAN ENVIRONMENTAL DISCLOSURE TERHADAP FINANCIAL PERFORMANCE PERUSAHAAN PERTAMBANGAN DAN PEMEGANG HPH / HPHTI YANG TERDAFTAR DI BURSA». *jurnal Megister Akuntansi* 6(3):35–42.
- Rosyid, Ahmad. 2015/. «PENGARUH KINERJA SOSIAL DAN KINERJA LINGKUNGAN TERHADAP KINERJA KEUANGAN». *Jurnal Penelitian* 12(1):72–85.
- Sari, eka Nurmala, et al. Elizar Sinambela. 2008/. «Pengaruh Pengungkapan Tanggung Jawab Sosial Perusahaan Terhadap Kinerja Keuangan Perusahaan (Studi Empiris pada Perusahaan Perkebunan di Sumatera Utara) Eka». *Jurnal Riset Akuntansi dan Bisnis* 8(2):1–21.
- Setyaningsih, Riska Dewi, et al. Nur Fadrih Asyik. 2016/. «Pengaruh Kinerja Lingkungan Terhadap Kinerja Keuangan Dengan Corporate Social Responsibility sebagai Pemoderasi». *Jurnal Ilmu dan Riset Akuntansi* 5(4):1–15.
- Shafariani, Dhesy Eka Putri. 2013/. «Pengaruh Tanggung Jawab Sosial Perusahaan terhadap Kinerja Keuangan dengan Tata Kelola Perusahaan sebagai Pemoderasi». *Jurnal Reviu Akuntansi dan Keuangan ISSN: 2088-0685* 3(2):493–506.
- Suciwati, Desak Putu, Desak Putu Arie Pradnyan, et al. Cening Ardina. 2016/. «PENGARUH CORPORATE SOCIAL RESPONSIBILITY TERHADAP KINERJA KEUANGAN (Pada Perusahaan Sektor Pertambangan di BEI Tahun 2010-2013)». *Jurnal Bisnis Dan Kewirausahaan* 12(2):104–13.
- Sudaryanti, Dwiyani, et al. Yosevin Riana. 2017/. «Pengaruh Pengungkapan CSR terhadap Kinerja Keuangan Perusahaan». *Jurnal MIPA* 2(1):19–31.
- Sugiyono. 2013/. *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Sumani, et al. Ika Barokah Suryaningsih. 2020/. «Intellectual capital, capital structure and growth of the company and its implications on value index formers Lq-45». *International Journal of Scientific and Technology Research* 9(1):4182–89.
- Swastika, Heni, et al. Titik Aryati. 2016/. «Pengaruh Tanggung Jawab Sosial Perusahaan Terhadap Kinerja Perusahaan Perbankan». *Jurnal Informasi, Perpajakan, Akuntansi dan keuangan Publik* 11(1):15–30.
- Tjahyono, Mazda Eko Sri. 2009/. «PENGARUH KINERJA LINGKUNGAN TERHADAP NILAI PERUSAHAAN». *Jurnal Ekonomi* 4(1):38–46.

- Vivianita, Alfa, eta Febrina Nafasati. 2016/. «PENGARUH ENVIRONMENTAL PERFORMANCE TERHADAP KINERJA KEUANGAN DENGAN CORPORATE GOVERNANCE SEBAGAI VARIABEL PEMODERASI (Studi Kasus Perusahaan Tambang yang Terdaftar di Bursa Efek Indonesia Tahun 2014-2016)». *Jurnal Riset Pembangunan* 3(1):295–305.
- W, Indah Fajarini S., eta Riza Firmansyah. 2012/. «Pengaruh Intellectual Capital Terhadap Kinerja Keuangan Perusahaan (Studi Empiris Perusahaan Lq 45)». *Jurnal Dinamika Akuntansi* 4(1):1–12.
- Yulianingtyas, Devita. 2016/. «Pengaruh Corporate Social Responsibility Dan Good». *Jurnal Ilmu dan Riset Manajemen* 5(1994):1–21.