Scopus indexed
Q3 | 0.21 | 0.66 | 1.7
ISSN 1693-6930
Vol. 19 No. 2, April 2021

TELKOMNIKA

Telecommunication Computing Electronics and Control

http://journal.uad.ac.id/index.php/TELKOMNIKA

UAD Universitas Ahmad Dahlan
iaes institute of advanced engineering and science

TELKOMNIKA Vol. 19 No. 2, April 2021

Telkomnika

COUNTRY	SUBJECT AREA AND CATEGORY	PUBLISHER	H-INDEX
Indonesia Universities and research institutions in Indonesia	Engineering Electrical and Electronic Engineering	Institute of Advanced Engineering and Science (IAES)	23

PUBLICATION TYPE	ISSN	COVERAGE	INFORMATION
Journals	16936930, 2087278X	2011-2020	Homepage How to publish in this journal telkomnika@uad.ac.id

SCOPE

TELKOMNIKA (Telecommunication Computing Electronics and Control) is a peer reviewed International Journal in English published four issues per year (March, June, September and December). The aim of TELKOMNIKA is to publish high-quality articles dedicated to all aspects of the latest outstanding developments in the field of electrical engineering. Its scope encompasses the engineering of signal processing, electrical (power), electronics, instrumentation & control, telecommunication, computing and informatics which covers, but not limited to, the following scope: Signal Processing[...] Electronics[...] Electrical[...] Telecommunication[...] Instrumentation & Control[...] Computing and Informatics[...]

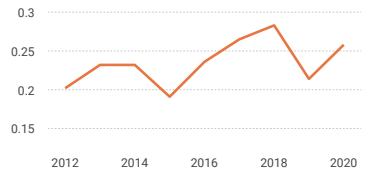
Quartiles

FIND SIMILAR JOURNALS

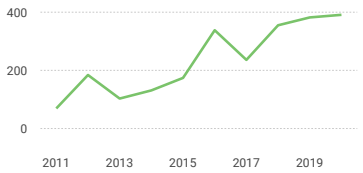
options

1	2	3	4	5
Indonesian Journal of Electrical Engineering and IDN	**Indonesian Journal of Electrical Engineering and** IDN	**Bulletin of Electrical Engineering and Informatics** IDN	**International Journal of Electrical and Computer** IDN	**Journal of Telecommunication,** MYS
48% similarity	**46%** similarity	**44%** similarity	**41%** similarity	**22%** similarity

SJR

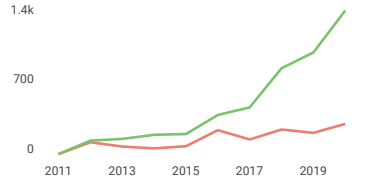


Total Documents

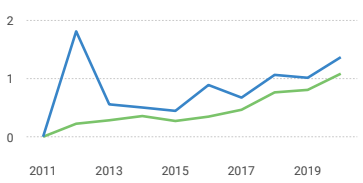


Citations per document

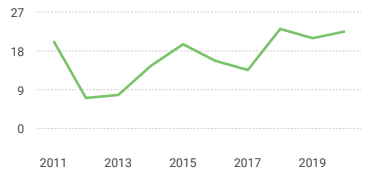
Total Cites Self-Cites



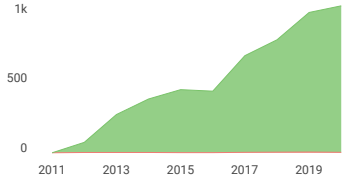
External Cites per Doc Cites per Doc



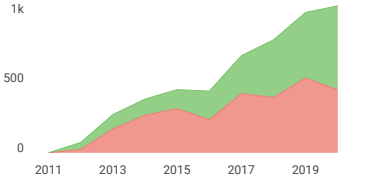
% International Collaboration



Citable documents Non-citable documents



Cited documents Uncited documents



← Show this widget in your own website

Just copy the code below and paste within your html code:

<a href="https://www.scima

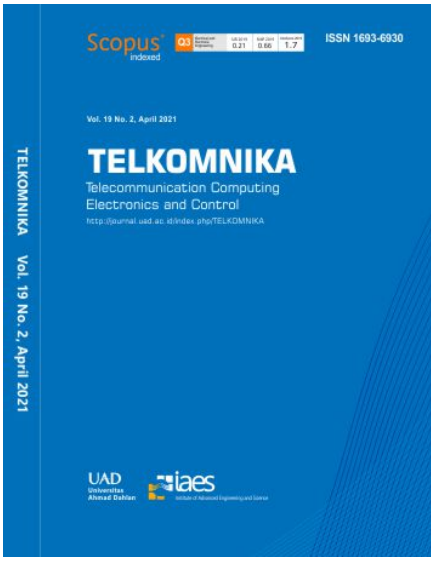
SCImago Graphica

Explore, visually communicate and make sense of data with our **new free tool**.

Get it

TELKOMNIKA (Telecommunication Computing Electronics and Control)

TELKOMNIKA (Telecommunication, Computing, Electronics and Control) ISSN: 1693-6930, e-ISSN: 2302-9293 is a peer-reviewed, scientific journal published by Universitas Ahmad Dahlan (UAD) *in collaboration with* Institute of Advanced Engineering and Science (IAES). The aim of this journal is to publish high-quality articles dedicated to all aspects of the latest outstanding developments in the field of electrical & electronics engineering and computer science. Its scope encompasses the applications of Telecommunication, Computing, Electrical & Electronics, and Instrumentation & Control. It was first published in 2003. Beginning with issue 1 of volume 16 (2018), TELKOMNIKA will be published as a bimonthly journal (6 issues/year). The journal registered in the CrossRef system with Digital Object Identifier (DOI) prefix 10.12928. The Journal has been indexed by SCOPUS, Google Scholar, Scholar Metrics etc; accredited 'A' Grade by DGHE (Ministry of Research, Technology and Higher Education, Republic of Indonesia); registered BASE - Bielefeld Academic Search Engine and CORE KMi, etc. The Journal also have a license agreement with ProQuest LLC and EBSCO Publishing.



A submitted paper should be an original work, and should not have been presented or published previously. Submission for publication in this journal presumes that the paper is not being considered for publication elsewhere and is not under review by any other publication. All articles undergo a thorough evaluation process while following all ethical guidelines to maintain the highest publishing standards. The TELKOMNIKA Team strictly review suitability, originality of manuscripts for publication. Our Editors maintain transparency of research, assess manuscript for scientific value, ensure that content is free from any manifestations of discrimination, and evaluate information objectively without any conflict of interests. **Publication integrity is one of the principle responsibilities we take.** Beginning with **issue 1** of **volume 20 (2022), TELKOMNIKA** will publish about **25 manuscripts ONLY** per **issue** (or about **150 manuscripts** per **year**).

Authors should submit only papers that have been carefully proofread and polished. Manuscripts are accepted with the understanding that they are an original or extended version of previously published papers in conferences and/or journals and that, if the work received an official sponsorship, it has been duly released for open publication. Before submission please make sure that your paper is prepared using the journal paper template. The authors must refer to TELKOMNIKA Journal for writing format and style (Please download and use as a template for initial manuscript submission in .DOCX or LATEX). This will ensure fast processing and publication. Any papers not fulfilling the requirements based on the guideline to authors will not be processed.

Submit

If you have any problems with the online submission, please do email to telkomnika [at] uad.ac.id (subject: Your Name_Problem with Online Submission), and cc: telkomnika [at] journal.uad.ac.id.

Announcements

Improving Quality of the TELKOMNIKA

Dear Authors,

In **2022**, we plan to publish **6 issues** *(as in 2018-2021)*, and **each issue is about 25 papers**. We will publish high quality original/research articles only, and some review papers by invitation. We intend to maintain, improve the high standards of excellence, visibility and further develop of the journal. The goal is to maintain journal indexation in the Scopus and to get indexation in the Web of Science, with the continuous increasing the quality of the journal articles and visibility of the journal.

We would be more than happy to receive any suggestions for improving our Journal.

Than you

Best Regards,
Tole Sutikno
Editor-in-Chief

Posted: 2021-04-02 More...

Editorial Team

TELKOMNIKA Telecommunication, Computing, Electronics and Control
ISSN: 1693-6930, e-ISSN: 2302-9293
Universitas Ahmad Dahlan, 4th Campus
Jl. Ringroad Selatan, Kragilan, Tamanan, Banguntapan, Bantul, Yogyakarta, Indonesia 55191
Phone: +62 (274) 563515, 511830, 379418, 371120
Fax: +62 274 564604

Reviewers of TELKOMNIKA

The Editors gratefully acknowledge the assistance of the following people, who reviewed manuscripts for TELKOMNIKA (Telecommunication Computing Electronics and Control).

- A. Arockia Bazil Raj, Defence Institute of Advanced Technology (Deemed University), India, Scopus Author ID: 26639770500
- A.N. Afandi, State University of Malang, Indonesia, Scopus Author ID: 56107604800
- Abdelfatah Kolli, IFSTTAR - French institute of science and technology for transport, France, Scopus Author ID: 55800660000
- Abdelhalim Kessal, Universite Bachir El Ibrahimi de Bordj Bou Arreridj, Algeria, Scopus Author ID: 37664472800
- Adil Denizli, Hacettepe Universitesi, Turkey, Scopus Author ID: 7101623828
- Adolfo Dannier, Universita degli Studi di Napoli Federico II, Italy, Scopus Author ID: 22834293500
- Afandi, A. N., State University of Malang, , Indonesia, Scopus Author ID: 56107604800
- Ahmed El-Mowafy, Curtin University, Australia, Scopus Author ID: 7004059531
- Ahn, Jong Hyun, Yonsei University, School of Electrical and Electronic Engineering, Seoul, South Korea, Scopus Author ID: 56637126000
- Aiman Zakwan Jidin, Universiti Teknikal Malaysia Melaka, Malaysia, Scopus Author ID: 56470973700
- Akito Sasaki, University of Tokyo, Japan, Scopus Author ID: 7402225383
- Akram Reza, Islamic Azad University, Iran, Scopus Author ID: 26435542000
- Andrea Morabito, Universita degli Studi di Reggio Calabria, Italy, Scopus Author ID: 16024894100
- Angelo Chianese, Universita degli Studi di Napoli Federico II, Italy, Scopus Author ID: 35317103300
- Ardeshir Hezarkhani, Amirkabir University of Technology, Iran, Scopus Author ID: 12795689200
- Arif Basgumus, Dumlupinar Universitesi, Turkey, Scopus Author ID: 8532006600
- Arun Prakash, Motilal Nehru National Institute of Technology, India, Scopus Author ID: 55810605800
- Awang Pratomo, Universitas Pembangunan Nasional Veteran Yogyakarta, Indonesia, Scopus Author ID: 35174983600
- Ban Khammas, Universiti Teknologi Malaysia, Malaysia, Scopus Author ID: 56151984900
- Bayu Kanigoro, Bina Nusantara University, Indonesia, Scopus Author ID: 55792309400
- Bennett, Thomas, Florida Atlantic University, United States, Scopus Author ID: 57197372255
- Beom Kwon, Yonsei University, South Korea, Scopus Author ID: 56076830000
- Camila Sundermann, Universidade de Sao Paulo - USP, Brazil, Scopus Author ID: 56344725900
- Chénier, Félix, Institut universitaire sur la réadaptation en déficience physique de Montréal, Pathokinesiology Laboratory, Montreal, Canada, Scopus Author ID: 50560896200
- Chiara Bedon, Universita degli Studi di Trieste, Italy, Scopus Author ID: 36468065600
- Chih-Lung Shen, National Kaohsiung First University of Science and Technology, Taiwan, Scopus Author ID: 7402860121
- D'Agostino, Fabio, Consiglio Nazionale delle Ricerche, Institute for Coastal Marine Environment, Rome, Italy, Scopus Author ID: 14055634900
- Da Silva, Leandro Aureliano, Universidade de Uberaba, Department of Electrical Engineering, Uberaba, Brazil, Scopus Author ID: 23567719100
- Darak, Sumit Jagdish, Indraprastha Institute of Information Technology Delhi, New Delhi, India, Scopus Author ID: 36169103800
- Deepali K. Borakhade, St. Vincent Pallotti College of Engineering and Technology, India, Scopus Author ID: 56081507700
- Dethan, Jacob F.N., Monash University Malaysia, Malaysia, Scopus Author ID: 57200495795
- Dilek Küçük, Turkiye Bilimsel ve Teknolojik Arastirma Kurumu, Turkey, Scopus Author ID: 25652213800
- Dominic Williams, Hewdon Consulting, United Kingdom, Scopus Author ID: 35996114000
- Durgesh Singh, UGC-DAE Consortium for Scientific Research India,India, Scopus Author ID: 56037689000
- Elisa Negri, Politecnico di Milano, Italy, Scopus Author ID: 56349650400
- Eroshkin, Sergey, Moscow State Technical University of Civil Aviation, Moscow, Russian Federation, Scopus Author ID: 25654790600
- Faisal Ahmed, Islamic University of Technology, Bangladesh, Scopus Author ID: 26025950100
- Fernandes, Diogo A.B., PepsiCo, , Poland, Scopus Author ID: 55959661700
- Ferretti, G., Politecnico di Milano, Dipartimento di Elettronica Informazione e Bioingegneria, Milan, Italy, Scopus Author ID: 56227784200
- Ferry Wahyu Wibowo, AMIKOM Yogyakarta University, Indonesia, Scopus Author ID: 55443377300
- Ferry Wahyu Wibowo, AMIKOM Yogyakarta University, Indonesia, Scopus Author ID: 55443377300
- Fornace, Kimberly M., Royal Veterinary College University of London, United Kingdom, Scopus Author ID: 24472918000
- Fraire, Juan Andres, Universidad Nacional de Cordoba, Argentina, Scopus Author ID: 55667636500
- García, Elena, Universidad Politecnica de Madrid, Madrid, Spain, Scopus Author ID: 7402250033
- Gatc, Jullend, Kalbis Institute, Indonesia, Scopus Author ID: 56118948100
- Ghodrati Amiri, Gholamreza, Iran University of Science and Technology, Iran, Scopus Author ID: 16633816200
- Gilmanur Rashid, ABB Group, United States, Scopus Author ID: 37124754300
- Guanglei Tian, China Jiliang University, China, Scopus Author ID: 8569129500
- Guo, Jinhua, University of Michigan-Dearborn, United States, Scopus Author ID: 22733942100
- Guoxing Zhan, Wayne State University, United States, Scopus Author ID: 26533613300
- Hadi Nasiri-Rad, Semnan University, Iran, Scopus Author ID: 26321877600
- Hairol Nizam Mohd Shah, Universiti Teknikal Malaysia, Malaysia, Scopus Author ID: 35185637500
- Hekmati, Arsalan, Shahid Beheshti University, Tehran, Iran, Scopus Author ID: 24605066200
- Hong-Wei Yang, Nanjing Agricultural University, China, Scopus Author ID: 8271300900
- Hossein Shahinzadeh, Amirkabir University of Technology, Iran, Scopus Author ID: 55855215900
- Hugeng, Hugeng, Universitas Multimedia Nusantara, Tangerang, Indonesia, Scopus Author ID: 55135962100
- Hung Tran, Malardalens hogskola, Sweden, Scopus Author ID: 7202596558
- Imamul Muttakin, Edwar Technology Co., Indonesia, Scopus Author ID: 36703129000
- Intan Areni, Hasanuddin University, Indonesia, Scopus Author ID: 38361089400
- Ioannis Korkontzelos, Edge Hill University, United Kingdom, Scopus Author ID: 57194016459
- Izhak Michaelevski, Ariel University, Israel, Scopus Author ID: 6507717638
- Jian Ouyang, Nanjing University of Post and TeleCommunications, China, Scopus Author ID: 57201237501
- Jianhua Yan, Zhejiang University, China, Scopus Author ID: 7403729306
- Jidin, Auzani Bin, Universiti Teknikal Malaysia, Malaysia, Scopus Author ID: 36910175700
- Jingyu Tang, PLA University of Science and Technology, China, Scopus Author ID: 57194456480
- John K. Tarus, Beijing Institute of Technology, China, Scopus Author ID: 56469465400
- Jullend Gatc, Kalbis Institute, Indonesia, Scopus Author ID: 56118948100
- Kamarudin, Muhammadramlee, Cranfield University, Cranfield, United Kingdom, Scopus Author ID: 11940735500
- Kartika Firdausy, Universitas Ahmad Dahlan, Indonesia, Scopus Author ID: 57190671256
- Kelton A.P. Costa, UNESP-Universidade Estadual Paulista, Brazil, Scopus Author ID: 54917025300
- Khalil Azha Mohd Annuar, Universiti Teknikal Malaysia Melaka, Malaysia, Scopus Author ID: 56333614300
- Khan, Diba, National Center for Health Statistics, Hyattsville, United States, Scopus Author ID: 55933880400
- Kristijan Kuk, Academy of Criminalistic and Police Studies, Serbia, Scopus Author ID: 45561264500
- Lee, Chie In, National Sun Yat-Sen University Taiwan, Department of Electrical Engineering, Kaohsiung, Taiwan, Scopus Author ID: 57140997200
- Li, Ming, Institute of Semiconductors Chinese Academy of Sciences, Beijing, China, Scopus Author ID: 56911221500
- Li, Qiang, Nanjing University of Science and Technology, School of Energy and Power Engineering, Nanjing, China, Scopus Author ID: 56166538600
- Lorena M. Fortuna, City College of New York, United States, Scopus Author ID: 56640894400
- M. Nazari-Heris, University of Tabriz, Iran, Scopus Author ID: 56604148800
- M. Trabelsi, Texas A and M University at Qatar, Qatar, Scopus Author ID: 36651742900
- M.M. Ardehali, Amirkabir University of Technology, Iran, Scopus Author ID: 6603687996
- Malik, Reza Firsandaya, Universitas Sriwijaya, Indonesia, Scopus Author ID: 55976994100
- Marta Vallejo, Heriot-Watt University, Edinburgh, United Kingdom, Scopus Author ID: 7004446108
- Maso, Marco, Huawei Technologies France SASU, France, Scopus Author ID: 36663826600
- Mendes De Seixas, Falcondes José, Universidade de Sao Paulo - USP, Department of Electrical Engineering, Sao Paulo,

TELKOMNIKA Telecommunication, Computing, Electronics and Control
ISSN: 1693-6930, e-ISSN: 2302-9293
Universitas Ahmad Dahlan, 4th Campus
Jl. Ringroad Selatan, Kragilan, Tamanan, Banguntapan, Bantul, Yogyakarta, Indonesia 55191
Phone: +62 (274) 563515, 511830, 379418, 371120
Fax: +62 274 564604

Editorial Policies

Focus and Scope

TELKOMNIKA (Telecommunication Computing Electronics and Control) publishes six issues per year (February, April, June, August, October and December). The aim of TELKOMNIKA is to publish **high-quality articles** dedicated to all aspects of the latest outstanding developments in the field of electrical & electronics engineering, and computer science **from authors world-wide**. Its scope encompasses the engineering of telecommunication, computing, electrical & electronics, and instrumentation & control, which covers, but not limited to, the following scope:

Communication Engineering: Antenna and wave propagation; Communication electronics and microwave; Communication network and systems; Compression through intelligent communication; Cooperative and cognitive wireless networks; Design, modelling and optimisation of photonics devices; Diamond-based photonics devices; Error control coding; Fiber-optic communication; Global navigation satellite systems; High-speed switching architectures; LDPC coding; MIMO systems; Mobile content distribution systems; Modal propagation in electromagnetic optical waveguides; Modulation and signal processing for telecommunication; Multiuser information theory; Nanophotonics; OFDM; Optical networks; Photonic signal processing technologies; Quantum communications; Radar and sonar signal processing; Radar imaging; Radio communication; Robust communication of scalable multimedia content; Routing protocols; Space-time coding; Telematics services and security network; Cognitive radio; Turbo coding; Wideband-CDMA; Wireless and mobile communications; Wireless communications; Wireless network coding; Wireless positioning systems; Wireless security; Wireless sensor network; Wireless systems; Wireless, mobile & satellite communications; etc.

Computer Network and System Engineering: Computer and communication networks: planning, implementation, operation and management of a communications network; Computer control systems design; Micro-controller applications, designs, programming and integration; Microprocessor, digital and electronic theory and application; Network and systems security: mechanisms and techniques for the security and privacy of information in the media and systems that transport and process it; Network communication theory, test, design, and applications; Network implementation and administration; Operating systems; Project Management; Real-time control networks; Software development and applications; Systems management: design, installation and management of different types of services and systems, hardware and software technologies; etc.

Computer Science and Information System: Analog computing; Approximate computing; Big data; Bioinformatics; Blockchain; Business process; Case studies and experimental and theoretical evaluations; Cloud computing (runtime systems, parallel and distributed systems, virtualization, and software-hardware interactions); Cognitive systems; Computational theory and mathematics; Computer architecture; Computer components and interconnection networks; Computer graphics and computer-aided design; Computer network security; Computer networks and communications; Computer organizations and architectures (multicores, accelerators, application-specific, processing-in-memory, near-data processing, and datacenters); Computer science applications; Computer security; Computer vision; Data mining; Data and knowledge level modelling; Dependable computing; Distributed computing system; Edge computing; High performance computing; Human-computer interaction; Human-machine interface; Information management practices; Information retrieval; Information search engine; Internet service architectures; Internet trust and privacy; IT governance; Knowledge based management system; Knowledge discovery in data; Mobile processing; Multimedia security; Networking technology; New and important applications and trends; Next generation media; Next network generation; Operating systems; Parallel and distributed computer; Performance modelling; Performance, fault tolerance, reliability, security, and testability; Pervasive computing; Programming (programming methodology and paradigm); Quantum computing; Neuromorphic computing; Software developments; Software engineering (software: lifecycle, management, engineering process, engineering tools and methods); Software systems; Specification, design, prototyping, and testing methods and tools; Stochastic systems; Virtual/augmented reality; etc.

Machine Learning, AI and Soft Computing: Agent systems; Ant algorithm; Ant colony optimization; Approximate reasoning; Artificial intelligence; Artificial neural networks; Automated reasoning; Bayesian network; Bayesian statistics; Biologically inspired computing; Brain emotional learning; Business intelligence; Chaos theory; Chaotic systems; Cognitive science; Complex systems theory; Computational creativity; Decision support system; Deep learning; Differential evolution; Early cybernetics and brain simulation; Evolutionary algorithms; Evolutionary computing; Expert system; Functional approximation; Fuzzy logic; Fuzzy set theory; Fuzzy systems; Genetic algorithm; Genetic programming; Hidden Markov model; Hybrid neural network; Intelligent controller; Intelligent system; Kalman filter; Machine intelligence; Machine learning techniques; Metaheuristic; Natural intelligence; Natural language processing (NLP); Nouvelle AI; Neural net systems; Neural science; Neural systems; Particle swarm optimization; Perceptron; Probabilistic models; Randomized search; Recurrent neural network; Regression trees; Superintelligence; Support vector machines; Symbolic AI; Swarm intelligence; etc.

Signal, Image and Video Processing: Acoustic and vibration signal processing; Biomedical imaging and image processing; Biomedical signal processing; Biometrics; Communication signal processing; Compression; Data processing; Detection and estimation; Digital signal & data processing; Digital signal processing; Earth resources signal processing; Emotion detection; Environmental signal processing; Facial recognition systems; Feature extraction; Filtering; Forensic voice comparison; Genomic signal processing; Geophysical and astrophysical signal processing; Handwriting recognition; Image and video compression: scalability, interactivity, international; Image processing: statistical inverse problems, motion estimation; Image processing; Industrial applications; Medical imaging equipment and techniques; Multi-dimensional signal processing; New applications; Emotion and mental state recognition from speech; Optical signal processing; Pattern recognition; Radar signal processing; Remote sensing; Segmentation; Seismic signal processing; Signal processing systems; Signal processing technology; Signal theory; Sonar signal processing; Spectral analysis; Speech and audio coding; Speech and speaker recognition; Speech based emotion recognition; Speech enhancement; Speech modelling and feature extraction; Speech processing, signal processing for audio; Statistical and multidimensional signal processing; Stochastic processes; Video processing; Visual and performance arts; etc.

Electronics Engineering: Amplifying electronic signals; Analog circuits; Application-specific polymer optical fibres and devices; Application-specific silica optical fibres and devices; Bioelectronics; Biomechanics and rehabilitation engineering; Biomedical circuits; Biomedical transducers and instrumentation; Building blocks and systems; Circuit theory and applications; Circuits; Complementary metal–oxide–semiconductor (CMOS); Consumer electronics; Design and implementation of application specific integrated circuits (ASIC); Digital electronics; Electromagnetic theory; Electronic components; Electronic devices; Electronic instrumentation; Electronic materials; Electronic sensors; Electronic systems; Embedded system; Filters; High levels design languages; Integrated circuits; Interface circuits; Measurement and acquisition of physical quantities; Medical electronics; Memristors and memristive circuits; Microcontrollers; Microelectronic system; Microprocessor; Mixed signal circuits; MOSFET; Network analysis and synthesis; Neuromorphic circuits; Organic field-effect transistor; Oscillators; Phase-locked loop (PLL); Printed electronics; Programmable logic chips; Programmable logic devices; RF circuits; Semiconductor devices; Silicon thin-film cell; System-on-a-chip (SoC); Thin film electronics; Thin-film diode; Thin-film memory; Thin-film solar cell; Thin-film transistor; Transform to electrical signals; Transistor; VLSI Design; Voltage-controlled oscillator (VCO); etc.

Electrical Power Engineering: Development modelling and analysis of environmental impact of electric power systems; Development, stability, availability, reliability and operational safety of electric power system subsystems; Disturbances and

transient phenomena in power systems; Economic analysis in electrical power engineering; Efficient use of energy and energy conservation; Electric facilities automation; Electric power generation; Electric traction; Electric usage; Electrical apparatus connected to such systems; Electrical engineering materials; Electrical measurements; Electromagnetic compatibility; Energy efficiency methods; Energy management; Environmental protection; Establishment of open market environment, risk management and electrical energy trading; Flexible alternating current transmission system (FACTS); High voltage apparatuses; High voltage insulation technologies; Lightning detection and protection; Mathematical modelling of power plants components and subsystems; Deterministic and reliability analysis of operational safety; New power system technologies; Optimization methods applied to power systems; Power economic; Power electronics; Power generation; Power transmission and distribution; Power system control and stability; High voltage engineering; Dielectrics and insulation technology; Electrical machinery; Power quality; Power system analysis; Power system protection; Reactive power control; Reliability theory; Renewable energy (wind, solar/photovoltaic, hydro, tidal, geothermal, biomass); Smart grid; Micro grid; Distributed generation; Industrial power systems; Green facilities and industries; Electromagnetic compatibility; SCADA; Theory of power systems control; Transmission and distribution networks network planning; Transmission and distribution; Utilization of electric power; etc.

Power Electronics and Drives: Active components; Adjustable speed drives; Advanced power converter topologies; All types of converters, inverters, active filters, switched mode power and uninterruptible power supplies; Batteries and Fuses; Batteries and management systems (BMS); Contactless power supply; Control and conversion of electric power in electric machine drives; Current control for shunt active power filters using predictive control; Current control of AC/DC or AC/DC/AC converters using predictive control; Current control; Distributed power supplies; Electrical machines; Electronic ballasts and solid-state lighting; EMC and noise mitigation; EV´s battery chargers: contact and contact-less, standards and regulations; Fault coordination and protection of DC grids; Hard and soft switching techniques; High performance drives; High-voltage direct current (HVDC); Model predictive control in industrial electronics; Motion control; New applications of predictive control for power converters; New materials and active devices; Packaging & thermal management; Passive components; Photovoltaic devices; Power converters for electric vehicles; Power electronics and Applications; Power factor correction techniques; Power semiconductor devices; Predictive control for power electronics and drives applications; Simulation and animation in power electronics and drive systems; Special drives; Static Synchronous Compensator (STATCOM); Techniques for controlling, analysing, modelling and/or simulation of power electronics circuits and complete power electronic systems; Uninterruptible power supplies (UPS); Vehicles and applications where a movement is created by an electric propulsion system; etc.

Instrumentation and Control Engineering: Adaptive controls; Advanced computing for measurement; Advanced control techniques; Advanced manufacturing systems; Applications of control theory in industry; Automated guided vehicles; Automation industrial applications; Complex adaptive systems; Control and automation; Control and intelligent systems; Control stochastic; Control theory and applications; Digital control; Distributed control; Dynamic simulation Man/Machine interface; Fault detection and isolation; Fieldbus technology and interfaces; Hybrid and switching control; Image-based control; Industrial automation; Linear and nonlinear control systems; Manufacturing systems and automation; Mathematical control theory; Measurement techniques; Mechatronics; Modelling and identification; Optimization and optimal control; Predictive control; Process control and instrumentation; Process optimization and scheduling; Recent developments in automation and control; Recent trends in control systems; Robotics and applications; Robust control; Sampled-data control systems and digital control; Sensors; Stochastic control and filtering; System identification and control; Systems and automation; Transducer principles; Virtual instrumentation and control; etc.

Internet of Things (IoT): Applications of the IoT; Authentication and access control in IoT; Channel and traffic models; Circuit and system design for secure smart objects in the IoT; Circuit and system design for smart objects in the IoT; Communication systems and network architectures for the IoT; Computation, storage, and network virtualization in Mobile Cloud Computing (MCC); Emerging IoT business models and process changes; Energy efficient designs of architecture and device in IoT; Ethics and legal considerations in IoT; Experience reports from the introduction and operation of networked things in areas such as healthcare, logistics & transport; Green by IoT/Green of IoT Technology; Identification and biometrics in IoT; IoT access network technologies and capillary networks; IoT architectures and system such as things-centric, data-centric, service-centric architecture, CPS and SCADA platforms, future Internet design for IoT, cloud-based IoT, and system security and manageability; IoT enabling technologies such as sensors, radio frequency identification, low power and energy harvesting, sensor networks, machine-type communication, resource-constrained networks, real-time systems, IoT data analytics, in situ processing, and embedded software; IoT networking and communication, infrastructure and security; IoT protocols; IoT secure access network technologies and capillary networks; IoT secure network infrastructure; IoT security protocols; IoT services, applications, standards, and test-beds such as streaming data management and mining platforms, service middleware, open service platform, semantic service management, security and privacy-preserving protocols, design examples of smart services and applications, and IoT application support; Liability and policy enforcement in IoT; Methods for IoT security analysis and audit; Methods for secure by design IoT; Modeling, analysis, and optimization of MCC and IoT; Novel architecture designs and evaluations of MCC and IoT; Novel mobile cloud applications and services for IoT; Privacy and anonymization techniques in IoT; Privacy in applications of the IoT; Quality of Service (QoS) of MCC and IoT; Secure cloud of things; Secure spectrum management for M2M/IoT radio communications; Security of Big data in IoT; Security, privacy, and reliability issues of MCC and IoT; Spectrum management for M2M/IoT radio communications; Trends and challenges of MCC and IoT; etc.

Section Policies

Peer Review Process

Submitted papers are evaluated by anonymous referees by single blind peer review for contribution, originality, relevance, and presentation. The Editor shall inform you of the results of the review as soon as possible, hopefully in 10 weeks. Please notice that because of the great number of submissions that TELKOMNIKA has received during the last few months the duration of the review process can be up to 14 weeks.

Open Access Policy

This journal adhere to the best practice and high publishing standards and comply with the following conditions:

1. Provides immediate open access to its content on the principle that making research freely available to the public supports a greater global exchange of knowledge;
2. Allows the author to hold the copyright and to retain publishing right without restrictions;
3. Deposits content with a long term digital preservation or archiving program;
4. Uses DOIs as permanent identifiers;
5. Embeds machine-readable CC licensing information in articles;
6. Allows generous reuse and mixing of content, in accordance with CC BY-NC license;
7. Can Provide Provide article level metadata for any indexers and aggregators
8. Has a deposit policy registered with a deposit policy registry, e.g. Sherpa/Romeo.

Archiving

This journal utilizes the LOCKSS system to create a distributed archiving system among participating libraries and permits those libraries to create permanent archives of the journal for purposes of preservation and restoration. More...

Publication Ethics and Publication Malpractice Statement

This statement clarifies ethical behaviour of all parties involved in the act of publishing an article in our journals, including the authors, the editors, the peer-reviewers and the publisher (***Universitas Ahmad Dahlan*** and ***Institute of Advanced Engineering and Science***). This statement is based on COPE's Best Practice Guidelines for Journal Editors.

Ethical Guideline for Journal Publication

The publication of an article in a peer-reviewed IAES Journals is an essential building block in the development of a coherent and respected network of knowledge. It is a direct reflection of the quality of the work of the authors and the institutions that support them. Peer-reviewed articles support and embody the scientific method. It is therefore important to agree upon standards of expected ethical behavior for all parties involved in the act of publishing: the authors, the journal editors, the peer reviewers, the publisher and the society.

Universitas Ahmad Dahlan (UAD) and Institute of Advanced Engineering and Science (IAES) as publisher of this Journal takes its duties of guardianship over all stages of publishing extremely seriously and we recognize our ethical and other responsibilities. We are committed to ensuring that advertising, reprint or other commercial revenue has no impact or influence on editorial decisions. In addition, the UAD, IAES and Editorial Board will assist in communications with other journals and/or publishers where this is useful and necessary.

Publication decisions

The editors of the IAES journals are responsible for deciding which of the articles submitted to the journal should be published. The validation of the work in question and its importance to researchers and readers must always drive such decisions. The editors may be guided by the policies of the journal's editorial board and constrained by such legal requirements as shall then be in force regarding libel, copyright infringement and plagiarism. The editors may confer with other editors or reviewers in making this decision.

Fair play

An editor at any time evaluate manuscripts for their intellectual content without regard to race, gender, sexual orientation, religious belief, ethnic origin, citizenship, or political philosophy of the authors.

Confidentiality

The editor and any editorial staff must not disclose any information about a submitted manuscript to anyone other than the corresponding author, reviewers, potential reviewers, other editorial advisers, and the publisher, as appropriate.

Disclosure and conflicts of interest

Unpublished materials disclosed in a submitted manuscript must not be used in an editor's own research without the express written consent of the author.

Duties of Reviewers

Contribution to Editorial Decisions

Peer review assists the editor in making editorial decisions and through the editorial communications with the author may also assist the author in improving the paper.

Promptness

Any selected referee who feels unqualified to review the research reported in a manuscript or knows that its prompt review will be impossible should notify the editor and excuse himself from the review process.

Confidentiality

Any manuscripts received for review must be treated as confidential documents. They must not be shown to or discussed with others except as authorized by the editor.

Standards of Objectivity

Reviews should be conducted objectively. Personal criticism of the author is inappropriate. Referees should express their views clearly with supporting arguments.

Acknowledgement of Sources

Reviewers should identify relevant published work that has not been cited by the authors. Any statement that an observation, derivation, or argument had been previously reported should be accompanied by the relevant citation. A reviewer should also call to the editor's attention any substantial similarity or overlap between the manuscript under consideration and any other published paper of which they have personal knowledge.

Disclosure and Conflict of Interest

Privileged information or ideas obtained through peer review must be kept confidential and not used for personal advantage. Reviewers should not consider manuscripts in which they have conflicts of interest resulting from competitive, collaborative, or other relationships or connections with any of the authors, companies, or institutions connected to the papers.

Duties of Authors

Reporting standards

Authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance. Underlying data should be represented accurately in the paper. A paper should contain sufficient detail and references to permit others to replicate the work. Fraudulent or knowingly inaccurate statements constitute unethical behaviour and are unacceptable.

Data Access and Retention

Authors are asked to provide the raw data in connection with a paper for editorial review, and should be prepared to provide public access to such data (consistent with the ALPSP-STM Statement on Data and Databases), if practicable, and should in any event be prepared to retain such data for a reasonable time after publication.

Originality and Plagiarism

The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted.

Multiple, Redundant or Concurrent Publication

An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Submitting the same manuscript to more than one journal concurrently constitutes unethical publishing behaviour and is unacceptable.

Acknowledgement of Sources

Proper acknowledgment of the work of others must always be given. Authors should cite publications that have been influential in determining the nature of the reported work.

Authorship of the Paper

Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. All those who have made significant contributions should be listed as co-authors. Where there are others who have participated in certain substantive aspects of the research project, they should be acknowledged or listed as contributors. The corresponding author should ensure that all appropriate co-authors and no inappropriate co-authors are included on the paper, and that all co-authors have seen and approved the final version of the paper and have agreed to its submission for publication.

Hazards and Human or Animal Subjects

If the work involves chemicals, procedures or equipment that have any unusual hazards inherent in their use, the author must

clearly identify these in the manuscript.

Disclosure and Conflicts of Interest

All authors should disclose in their manuscript any financial or other substantive conflict of interest that might be construed to influence the results or interpretation of their manuscript. All sources of financial support for the project should be disclosed.

Fundamental errors in published works

When an author discovers a significant error or inaccuracy in his/her own published work, it is the author's obligation to promptly notify the journal editor or publisher and cooperate with the editor to retract or correct the paper.

Article acceptance requirements

The criteria for an article to be accepted for publication include:

1. The article should be original writing that enhances the existing body of knowledge in the given subject area. Original review articles and surveys are acceptable, even if new data/concepts are not presented.
2. Results reported have not been submitted or published elsewhere (although expanded versions of conference publications are eligible for submission).
3. Experiments, statistics, and other analyses are performed to a high technical standard and are described in sufficient detail.
4. Conclusions are presented in an appropriate fashion and are supported by the data.
5. The article is presented in an intelligible fashion and is written in Standard English.
6. Appropriate references to related prior published works must be included.

Checklist for preparing your paper for publication

You can use this list to carry out a final check of your submission before you send it to the journal for review.

1. Is your manuscript adhere to the minimum standards? (written in English; the length of submitted paper is at least 4 pages and no more than 16 pages; use of a tool such as **EndNote, Mendeley**, or **Zotero** for **reference management and formatting**, and choose **IEEE** style)
2. Is your manuscript written in TELKOMNIKA format? At this stage, it is essential that you follow every detail of the TELKOMNIKA format. Please try to follow the format as closely as possible.
3. is your title adequate and is your abstract correctly written? The title of paper is max 10 words, without Acronym or abbreviation. The Abstract (MAX 200 WORDS) should be informative and completely **self-explanatory (no citation in abstract)**, provide a clear statement of the **problem**, the **proposed** approach or solution, and point out **major findings** and conclusions.
4. Authors are suggested to present their articles in the sections structure**: Introduction - The Proposed Method/Algorithm/Procedure specifically designed (optional) - Research Method - Results and Discussion – Conclusion.** Authors may present complex proofs of theorems or non-obvious proofs of correctness of algorithms after introduction section (obvious theorems & straightforward proofs of existing theorems are NOT needed).
5. Introduction section: explain the context of the study and state the precise objective. An Introduction should contain the following three parts:
   - Background: Authors have to make clear what the context is. Ideally, authors should give an idea of the state-of-the art of the field the report is about.
   - The Problem: If there was no problem, there would be no reason for writing a manuscript, and definitely no reason for reading it. So, please tell readers why they should proceed reading. Experience shows that for this part a few lines are often sufficient.
   - The Proposed Solution: Now and only now! - authors may outline the contribution of the manuscript. Here authors have to make sure readers point out what are the novel aspects of authors work.
   Authors should place the paper in proper context by citing relevant papers. At least, 10 references (recently journal articles) are used in this section.
6. Method section: the presentation of the experimental methods should be clear and complete in every detail facilitating reproducibility by other scientists.
7. Results and discussion section: The presentation of results should be simple and straightforward in style. This section report the most important findings, including results of statistical analyses as apropriate and comparisons to other research results. Results given in figures should not be repeated in tables. This is where the author(s) should explain in words what he/she/they discovered in the research. It should be clearly laid out and in a logical sequence. This section should be supported suitable references.
8. Conclusion section: Summarize sentences the primary outcomes of the study in a paragraph. Are the claims in this section supported by the results, do they seem reasonable? Have the authors indicated how the results relate to expectations and to earlier research? Does the article support or contradict previous theories? Does the conclusion explain how the research has moved the body of scientific knowledge forward?
9. **Language**. If an article is poorly written due to grammatical errors, while it may make it more difficult to understand the science.
10. Please be sure that the manuscript is up to date. **It is expected that 20 to 30% of references are to recent papers.**
11. Is the manuscript clearly written? Is the article exciting? Does the content flow well from one section to another? Please try to keep your manuscript on the proper level. It should be easy to understand by well qualified professionals, but at the same time please avoid describing well known facts (use proper references instead). Often manuscripts receive negative reviews because reviewers are not able to understand the manuscript and this is authors' (not reviewers') fault. Notice, that if reviewers have difficulties, then other readers will face the same problem and there is no reason to publish the manuscript.
12. Do you have enough references? We will usually expect a minimum of 25 to 30 references primarily to journal papers, depending on the length of the paper. Citations of textbooks should be used very rarely and citations to web pages should be avoided. All cited papers should be referenced within the text of the manuscript.
13. Figures and Tables. Relation of Tables or Figures and Text: Because tables and figures supplement the text, all tables and figures should be referenced in the text. Avoid placing figures and tables before their first mention in the text. Authors also must explain what the reader should look for when using the table or figure. Focus only on the important point the reader should draw from them, and leave the details for the reader to examine on her own.
    Figures:
    a. All figures appearing in article must be numbered in the order that they appear in the text.
    b. Each figure must have a caption fully explaining the content
    c. Figure captions are presented as a paragraph starting with the figure number i.e. Figure 1, Figure 2, etc.
    d. Figure captions appear below the figure
    e. Each figure must be fully cited if taken from another article
    f. all figures must be referred to in the body of the article
    Tables:
    a. Material that is tabular in nature must appear in a numbered captioned table.
    b. All tables appearing in article must be numbered in the order that they appear in the text.
    c. Each table must have a caption fully explaining the content with the table number i.e. Table 1, Table 2, etc.
    d. Each column must have a clear and concise heading
    e. Tables are to be presented with single horizontal line under: the table caption, the column headings and at the end of the table.
    f. All tables must be referred to in the body of the article
    g. Each table must be fully cited if taken from another article
14. Each citation should be written in the order of appearance in the text in square brackets. For example, the first citation [1], the second citation [2], and the third and fourth citations [3,4]. When citing multiple sources at once, the preferred method is to list each number separately, in its own brackets, using a comma or dash between numbers, as such: [1], [3], [5] or [4-8]. It is not necessary to mention an author's name, pages used, or date of publication in the in-text citation. Instead, refer to the source with a number in a square bracket, e.g. [9], that will then correspond to the full citation in your reference list. Examples of in-text citations:
    - This theory was first put forward in 1970 [9]."
    - Sutikno [10] has argued that...
    - Several recent studies [7], [9], [11-15] have suggested that....
    - ...end of the line for my research [16].
15. Self-citations: to control for citation manipulation (COPE, 2019), this journal asks that authors keep self-citation to a minimum. We would strongly recommend no more than 5 (including jointly authored publications), or **20% self-citations, whichever number is lower**.
16. Please be aware that for the final submission of regular paper you will be asked to tailor your paper so the last page is not half empty.

Authorship

Authorship provides credit for a researcher's contributions to a study and carries accountability.

TELKOMNIKA considers individuals who meet all of the following criteria to be authors:

- Made a significant intellectual contribution to the theoretical development, system or experimental design, prototype development, and/or the analysis and interpretation of data associated with the work contained in the article.
- Contributed to drafting the article or reviewing and/or revising it for intellectual content.
- Approved the final version of the article as accepted for publication, including references.

Each author has approved the submitted version (and any substantially modified version that involves the author's contribution to the study).

Each author has agreed both to be personally accountable for the author's own contributions and to ensure that questions related to the accuracy or integrity of any part of the work, even ones in which the author was not personally involved, are appropriately investigated, resolved, and the resolution documented in the literature.

TELKOMNIKA does not require all authors of a research paper to sign the letter of submission, nor do they impose an order on the list of authors. Submission to TELKOMNIKA is taken to mean that all the listed authors have agreed all of the contents, including the author list and author contribution statements. The corresponding author is responsible for having ensured that this agreement has been reached that all authors have agreed to be so listed,and have approved the manuscript submission to the journal, and for managing all communication between the journal and all co-authors, before and after publication. The corresponding author is also responsible for submitting a competing interests' statement on behalf of all authors of the paper.

It is expected that the corresponding author (and on multi-group collaborations, at least one member of each collaborating group, usually the most senior member of each submitting group or team, who accepts responsibility for the contributions to the manuscript from that team) will be responsible forthe following with respect to data, code and materials:

- ensuring that data, materials, and code comply with transparency and reproducibility standards of the field and journal;
- ensuring that original data/materials/code upon which the submission is based are preserved following best practices in the field so that they are retrievable for reanalysis;
- confirming that data/materials/code presentation accurately reflects the original;
- foreseeing and minimizing obstacles to the sharing of data/materials/code described in the work
- ensuring that all authors (or group leaders in multi-lab collaborations) have certified the author list and author contributions

Author lists should be carefully considered before submission. At submission, the corresponding author must include written permission from the authors of the work concerned for mention of any unpublished material cited in the manuscript (for example others' data, in press manuscripts, personal communications or work in preparation). The corresponding author also must clearly identify at submission any material within the manuscript (such as figures) that has been published previously elsewhere and provide written permission from authors of the prior work and/or publishers, as appropriate, for the re-use of such material.

After acceptance, the corresponding author is responsible for the accuracy of all content in the proof, including the names of coauthors, addresses and affiliations. **Changes to author list post acceptance are not allowed.**

After publication, the corresponding author is the point of contact for queries about the published paper. It is their responsibility to inform all co-authors of any matters arising in relation to the published paper and to ensure such matters are dealt with promptly. Authors of published material have a responsibility to inform the journal immediately if they become aware of any aspects that requires correction.

Any changes to the author list after submission, such as a change in the order of the authors or the deletion or addition of authors, must be approved by every author. **TELKOMNIKA** editors are not in a position to investigate or adjudicate authorship disputes before or after publication. Such disagreements, if they cannot be resolved amongst authors, should be directed to the relevant institutional authority.

The primary affiliation for each author should be the institution where the majority of their work was done. If an author has subsequently moved, the current address may also be stated.

Withdrawal of Manuscripts

Author is not allowed to withdraw submitted manuscripts, because the withdrawal is a waste of valuable resources that editors and referees spent a great deal of time processing submitted manuscripts, money and works invested by the publisher.
If the author still requests withdrawal of his/her manuscript when the manuscript is still in the peer-reviewing process, the author will be punished with paying $200 per manuscript, as withdrawal penalty to the publisher. However, it is unethical to withdraw a submitted manuscript from one journal if accepted by another journal. The withdrawal of manuscript after the manuscript is accepted for publication, the author will be punished by paying US$500 per manuscript. Withdrawal of an accepted manuscript is only allowed after withdrawal penalty has been fully paid to the Publisher. If the author doesn't agree to pay the penalty, the author and his/her affiliation will be blacklisted for publication in this journal in future. Even his/her previously published articles will be removed from our online system.

Retraction and Correction policies

Withdrawing an already published paper is called a Retraction. A published article is a scientific record and we cannot make any changes without publishing a corrigendum. Universitas Ahmad Dahlan (UAD) takes its responsibility to maintain the integrity and completeness of the scholarly record of our content for all end users very seriously. Changes to articles after they have been published online may only be made under the circumstances outlined below. UAD places great importance on the authority of articles after they have been published and our policy is based on best practice in the academic publishing community. An Erratum is a statement by the authors of the original paper that briefly describes any correction(s) resulting from errors or omissions. Any effects on the conclusions of the paper should be noted. The corrected article is not removed from the online journal, but notice of erratum is given. The Erratum is made freely available to all readers and is linked to the corrected article. A Retraction is a notice that the paper should not be regarded as part of the scientific literature. Retractions are issued if there is clear evidence that the findings are unreliable, this can be as a result of misconduct or honest error; if the findings have previously been published elsewhere without proper referencing, permission or justification; if the work is plagiarized; or if the work reports unethical research. To protect the integrity of the record, the retracted article is not removed from the online journal, but notice of retraction is given, is made freely available to all readers, and is linked to the retracted article. Retractions can be published by the authors when they have discovered substantial scientific errors; in other cases, the Editors or Publisher may conclude that retraction is appropriate. In all cases, the retraction indicates the reason for the action and who is responsible for the decision. If a retraction is made without the unanimous agreement of the authors, that is also noted. In rare and extreme cases involving legal infringement, the Publisher may redact or remove an article. Bibliographic information about the article will be retained to ensure the integrity of the scientific record. A Publisher’s Note notifies readers that an article has been corrected subsequent to publication. It is issued by the Publisher and is used in cases where typographical or production errors (which are the fault of the Publisher) affect the integrity of the article metadata (such as title, author list or byline) or will significantly impact the readers' ability to comprehend the article. The original article is removed and replaced with a corrected version. Publisher’s Notes are freely available to all readers. Minor errors that do not affect the integrity of the metadata or a reader's ability to understand an article and that do not involve a scientific error or omission will be corrected at the discretion of the Publisher. In such a case, the original article is removed and replaced with a corrected version. The date the correction is made is noted on the corrected article. Authors should also be aware that an original article can only be removed and replaced with a corrected version less than one year after the original publication date. Corrections to an article which has a publication date that is older than one year will only be documented by a Publisher’s Note. The following guideline may also be helpful:
COPE Guidelines for Retracting Articles

TELKOMNIKA Profile in Scimago and Google Scholar

SCImago Journal & Country Rank

TELKOMNIKA Telecommunication, Computing, Electronics and Control - Google Scholar Citations

TELKOMNIKA Telecommunication, Computing, Electronics and Control
ISSN: 1693-6930, e-ISSN: 2302-9293
Universitas Ahmad Dahlan, 4th Campus
Jl. Ringroad Selatan, Kragilan, Tamanan, Banguntapan, Bantul, Yogyakarta, Indonesia 55191
Phone: +62 (274) 563515, 511830, 379418, 371120
Fax: +62 274 564604

Abstracting and Indexing

TELKOMNIKA Telecommunication Computing Electronics and Control is a **Scopus** indexed journal, **CiteScore** 2019**: 1.7**, **SNIP** 2019**: 0.659**, **SJR** 2019**: 0.21**, **Q3**. The TELKOMNIKA is abstracted/indexed in:

- Scopus
- Scimagojr
- Google Scholar
- Scholar Metrics
- Semantic Scholar
- SINTA Ristekdikti (all Indonesian Journals at SINTA)
- Publons
- IPI Portal Garuda
- ROAD
- CiteSeerX
- Asean Citation Index
- Microsoft Academic
- ProQuest
- EBSCOhost
- WorldCat OCLC
- CiteULike
- SHERPA/RoMEO

TELKOMNIKA Telecommunication, Computing, Electronics and Control
ISSN: 1693-6930, e-ISSN: 2302-9293
Universitas Ahmad Dahlan, 4th Campus
Jl. Ringroad Selatan, Kragilan, Tamanan, Banguntapan, Bantul, Yogyakarta, Indonesia 55191
Phone: +62 (274) 563515, 511830, 379418, 371120
Fax: +62 274 564604

Journal Contact

Mailing Address

Lab of Microcontroller and Embedded Systems
5th Floor, 2nd Building, 4th Campus of Universitas Ahmad Dahlan
Ahmad Yani st. (Southern Ring Road), Tamanan, Banguntapan, Bantul, Yogyakarta 55191, Indonesia
Email : telkomnika[at]ee.uad.ac.id

Principal Contact

Tole Sutikno
Editor-in-Chief, TELKOMNIKA
Universitas Ahmad Dahlan
Email: telkomnika@ee.uad.ac.id

Support Contact

TEAM TELKOMNIKA
Email: telkomnika@journal.uad.ac.id

TELKOMNIKA Telecommunication, Computing, Electronics and Control
ISSN: 1693-6930, e-ISSN: 2302-9293
Universitas Ahmad Dahlan, 4th Campus
Jl. Ringroad Selatan, Kragilan, Tamanan, Banguntapan, Bantul, Yogyakarta, Indonesia 55191
Phone: +62 (274) 563515, 511830, 379418, 371120
Fax: +62 274 564604

UAD Universitas Ahmad Dahlan

TELKOMNIKA (Telecommunication Computing Electronics and Control)

SJR Scopus Q3 Electrical and Electronic Engineering SJR 2020 0.258 SNIP 2020 0.746 CiteScore 2.2

Vol 17, No 5

October 2019

DOI: http://dx.doi.org/10.12928/telkomnika.v17i5

Table of Contents

TELKOMNIKA Telecommunication, Computing, Electronics and Control
ISSN: 1693-6930, e-ISSN: 2302-9293
Universitas Ahmad Dahlan, 4th Campus
Jl. Ringroad Selatan, Kragilan, Tamanan, Banguntapan, Bantul, Yogyakarta, Indonesia 55191
Phone: +62 (274) 563515, 511830, 379418, 371120
Fax: +62 274 564604

Information system of Limboto Lake potential management

Lanto Ningrayati Amali, Sunarty Eraku, Ishak Isa, Rifadli Bahsuan, Sitti Suhada, Muhammad Rifai Katili

Abstract

Limboto Lake is one of the lakes in Gorontalo Province; its water supply is generated from 23 small and large rivers. The lake holds potential in several sectors, e.g., tourism, fisheries, socio-economy and culture. However, such an advantage has no quality information system as it is found that there are no particular services that manage the information regarding Limboto Lake accurately. The objective of this research is to create an information system for the management of the potential area of the lake to provide quality services to access the information accurately and completely. The provided information is also updated timely. This research employed the System Development Life Cycle (SDLC) method in the development of the information system. Furthermore, the data were collected from interview, observation, and reviewing literature and document. This system is tested using white box and black box where it generated the expected outcome and is web-based. The output of this research is a system that eases the society to access the information regarding the management of the potential area in Limboto Lake.

Keywords

information system; Limboto Lake; management; potential area;

Full Text:

PDF

DOI: http://dx.doi.org/10.12928/telkomnika.v17i5.11800

Article Metrics

Abstract view : 0 times
PDF - 0 times

Refbacks

There are currently no refbacks.

TELKOMNIKA Telecommunication, Computing, Electronics and Control
ISSN: 1693-6930, e-ISSN: 2302-9293
Universitas Ahmad Dahlan, 4th Campus
Jl. Ringroad Selatan, Kragilan, Tamanan, Banguntapan, Bantul, Yogyakarta, Indonesia 55191
Phone: +62 (274) 563515, 511830, 379418, 371120
Fax: +62 274 564604

TELKOMNIKA, Vol.17, No.5, October 2019, pp.2292~2300
ISSN: 1693-6930, accredited First Grade by Kemenristekdikti, Decree No: 21/E/KPT/2018
DOI: 10.12928/TELKOMNIKA.v17i5.11800

Information system of Limboto Lake potential management

Lanto Ningrayati Amali*[1], Sunarty Eraku[2], Ishak Isa[3], Rifadli Bahsuan[4], Sitti Suhada[5], Muhammad Rifai Katili[6]
[1,4,5,6]Faculty of Engineering, Universitas Negeri Gorontalo, Indonesia
[2,3]Faculty of Mathematics and Natural Sciences, Universitas Negeri Gorontalo, Indonesia
*Corresponding author, e-mail: ningrayati_amali@ung.ac.id[1], sunarty.eraku@ung.ac.id[2], isi@ung.ac.id[3], rifadli@ung.ac.id[4], sittisuhada@ung.ac.id[5], mrifaikatili@ung.ac.id[6]

Abstract

Limboto Lake is one of the lakes in Gorontalo Province; its water supply is generated from 23 small and large rivers. The lake holds potential in several sectors, e.g., tourism, fisheries, socio-economy and culture. However, such an advantage has no quality information system as it is found that there are no particular services that manage the information regarding Limboto Lake accurately. The objective of this research is to create an information system for the management of the potential area of the lake to provide quality services to access the information accurately and completely. The provided information is also updated timely. This research employed the System Development Life Cycle (SDLC) method in the development of the information system. Furthermore, the data were collected from interview, observation, and reviewing literature and document. This system is tested using white box and black box where it generated the expected outcome and is web-based. The output of this research is a system that eases the society to access the information regarding the management of the potential area in Limboto Lake.

Keywords*: information system, Limboto Lake, management, potential area*

1. Introduction

A lake is the source of freshwater that holds the potential to fulfill the needs for people and it's a very attractive components of urban landscape [1]. In addition to the home for germplasms, a lake basically functions to supply water for the agricultural sector and the society and to generate energy for power plants. Tourism sector can also benefit much from the lake [2, 3].

Limboto Lake is among the lakes in Gorontalo Province; it is located approximately three kilometers from the west of Gorontalo City. The water supply of this lake is from 23 small or large rivers, e.g., Biyonga River, Meluopo River and Alo-Pohu River [4]. As an estuary of several rivers, the lake is considered quite large with the surface area around 3000 hectares. Marganof reports that Indonesia has more than 500 lakes with the total area of more than 5,000 km², meaning that the lakes dominate 0.25% of the area of the landform [5]. Limboto Lake is among those 500 lakes; it is located at Gorontalo regency. This lake is an asset to abundant natural resources for its role to prevent flooding; it also supports the living of the fisherman, and it serves as a tourist attraction. Research by Lehmusluoto and Machbub reveals that the shrinking and silting of Limboto Lake is faster than any other lakes in Indonesia [6]. In 1932, the area of the lake was around 7,000 ha with the depth 30m at maximum. The shrinking and silting became progressive until the 1970s. Recently, the area of Limboto Lake reaches ±2,958 with the depth of ±2.5 m. The approximate volume of the sediment is one to two million m³ per year, and the population of water hyacinth dominates 20% of the area of the lake. In 52 years, the lake lost 4304 or 62.60% of its area, meaning that it loses ±65.89 ha every year and ±5.49 every month. A number of studies argue that the lake will no longer remain by 2025 [7].

With that being said, preserving the lake by developing the management of the potential area is essential. This research plays a major role in supporting the management and preservation of Limboto Lake through creating an information system of the potential area of

Received November 12, 2018; Revised December 11, 2018; Accepted March 12, 2019

the lake. This system is expected to maintain the condition of the lake and promoting other sectors, such as the socio-cultural aspect or the wellbeing of the community near the lake. It also provides information regarding the tourism attraction and educative information for the researcher and for those who are interested in studying culture.

Identifying the potential of Limboto Lake is necessary to explore its natural resources, the way people (human resources) benefit from it, the land suitability and capacity, as well as the general condition of Limboto Lake. Doing so is of great advantage for the lake community. However, such an advantage has no quality information system as it is found that there are no particular services that manage the information regarding Limboto Lake accurately. The information regarding Limboto Lake can only be accessed by searching some websites discussing the lake or using search engines, such as Google. Such a method is common, yet it spends too much time, and it does not ensure that the information is valid as ones need to be selective to confirm the reliability of the website and its sources. In the light of the above discussion, creating an information system that manages the potential area of Limboto Lake, especially the one providing the detail of the lake is essential. This web-based system comprises varied contents, i.e., texts, images and videos, as well as some geospatial information about Limboto Lake.

Limboto Lake Area

The existence of the area of Limboto Lake plays a major role, in terms of the ecological, hydrological and socio-economic aspects, for the society in Gorontalo [8]. The hydrological function of the lake as the estuary of some rivers is crucial. It serves as a water absorption area, and it helps in the management of flooding and preventing erosion. From the perspective of biology, the lake serves as habitats of several plants and animals. Many people benefit much from the lake as it supports the livelihood of the fishermen through freshwater aquaculture. Furthermore, Limboto Lake is also a tourist destination where many people can visit it for some purposes, such as to conduct research and promoting cultural development [9]. Considering the above advantages, several stakeholders and more particularly the government are demanded to pay attention to the sustainability of the lake [10].

The foremost concern in Limboto Lake is the uncontrolled growth of water hyacinths that damage the lake. It causes the silting of the lake as the water volume of the lake reduces [8, 11]. Other factors affecting the condition of the lake are erosion and sedimentation. It is revealed that the level of the erosion in the catchment area of the lake reaches 9,902,588.12 ton per year where the area of the lake in 2006 was less than 3,000 ha with the average depth 2.5 m [12-14]. This is due to illegal logging and conversion of the lake area for cultivating maize. Such issues lead to the problem in balancing the nature of Gorontalo province by which it also affects the society. With that being said, rehabilitation, conservation and other efforts are needed to preserve and even to reconstruct the area of Limboto Lake.

Information System of the Management of Potential Area of Limboto Lake

Information system implementation in both the public and government sectors has been among the priorities for the needs of the business. This is due to its function in promoting the efficiency of public service and its competitiveness. The principle of developing an information system is synced between the demands of an institution for the information and the planning as well as the development of the system. Such consideration is necessary as the system contributes to some factors, e.g., management, organizational structure, human resources and policies.

The more complex an information system or computerized technology, the higher the possibility of the risks that is caused by some issues related to data integrity, privacy and misuse of the system [15]. An immediate and accurate decision-making process, competitiveness, and the development of business demand a sophisticated and reliable technology. In such a context, the success of an organization is determined by its optimum management of information system and technology. An information system is an intertwined element that manages the data to produce useful information. Some traits, e.g., relevance, complete and accurate are the characteristics of reliable and quality information. Hall and Alter define the term information system as a series of procedures where the data are grouped and processed which results in useful information [16, 17]. This output is further distributed to some parties that need this information. The information system of the management of the potential area of Limboto Lake serves to manage the data regarding the lake. To sum up, the term

information system describes a system that functions to gather, process, and transform data into valuable information.

Accuracy and timeliness are the aspects that should be considered when particular information is needed as this notion is the tenet of the importance of information. The use of digital technology promotes the effectiveness and efficiency of the provision of information. Furthermore, it also lowers the cost for the use of paper [18, 19]. An information system is expected to satisfy the user [20, 21]. Considering whether the system is able to satisfy the needs of the users or to conceptualize the ideas of the creator of the system is also essential. A quality information system should be able to fulfill the demands of the users despite that it might not encompass all users in some aspects other than the provision of access to information.

Nowadays, the development of an information system seems exclusive to the needs of the business where the management of such a system or technology is carried out by each functional unit. This results in a segregated process and information pieces as each system is not synced to use the data. Therefore, an integrated approach is required to overcome the aforementioned issue. This resonates to the idea by Al-Sudairy and Vasista that creating an integrated information system or application has been a challenge in the development of technology that demands certain data and its resources must be heterogenic [22, 23].

An integrated information system is able to incorporate data or information within an organization. Such a system is expected to boost the effectiveness and efficiency of the distribution of information. It also allows the process of data inputs, specifically the data regarding the potential area of Limboto Lake and attempts that should be made according to the established procedures.

2. Research Method

The object of this present study is the information system of the management of the potential area of Limboto Lake. This research employed the System Development Life Cycle (SDLC) method in the development of the information system [24, 25]. Furthermore, the data were from interview, observation, and reviewing literature and document. The processes of research procedure are depicted in the following Figure 1.

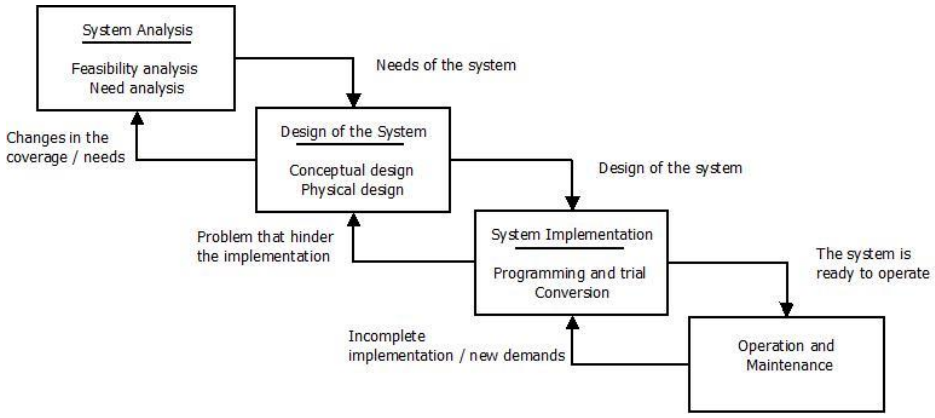


Figure 1. Research procedure

- System Analysis

The analysis of the system covers the feasibility and need analysis. It focuses on the issue relating to the management of the potential area of Limboto Lake through processes, i.e., problem identification, the feasibility of the creation of the system, the needs of the information users, and comprehending the system and the findings.

- Design of the System

The design of the system comprises two sub-processes, i.e., conceptual design (evaluating the alternative design, preparing the design specification and report of

the conceptual system) and physical design (the design of the input/output, a platform, user and system arithmetic, the basis of data, the model and its control).

- System Implementation

This step encompasses the programming and trial of the system, installation of the hardware and software, disseminating the information regarding the operation to the user through workshops and documentation.

- Operation and Maintenance

These steps cover the whole processes needed to ensure the sustainability and the completion of the system.

3. Results and Analysis

3.1. Analysis

The result of interview and observation with related stakeholders, such as the Tourism Board and Bappeda (Regency Development Planning Agency) reveals that the primary issue is the lack of quality information system and particular services that manage the information regarding Limboto Lake accurately. The information regarding Limboto Lake can only be accessed by searching some websites discussing the lake or using search engines, such as Google. However, the data from the websites is not confirmed reliable. This step encompasses the identification of the problem, i.e., the information that should be incorporated into the system. This information includes the history of the lake, its geographical location, photos and videos, article and news, and other information regarding the tourism area within the lake, such as the annual Limboto lake festival. The system is created as a web-based program that is expected to provide accurate, comprehensive and up-to-date information regarding Limboto Lake. Furthermore, this system also serves to promote the tourism sector and by providing services to access the tourism campaign. People can access the system as it is an open-access system. An administrator is assigned to manage the services of information access. The primary role of the administrator is to update and edit the information and news regarding Limboto Lake.

3.2. Designing the System

This step is aimed to boost the effectiveness and efficiency of the management of the campaign and the system regarding the potential area of Limboto Lake. Furthermore, its main objectives are twofold, namely:

- Developing a website that manages big data faster and it is integrated with some stakeholders, e.g., the Department of Tourism and Department of Maritime Affairs and Fisheries.
- Coping with the issues within systems that are yet to employ the recent technology, such as brochures or leaflets, and social media, i.e., Facebook, Instagram, and WhatsApp in the campaign of the tourism attraction of Limboto Lake is the objective of designing the new system. The design of this application system contains Unified Modeling Language (UML) that encompasses Use Case Diagram, Activity Diagram, and Sequence Diagram.

3.2.1. Use Case Diagram

This process is done by the administrator the visitors. The administrator is responsible for managing the homepage data, galleries, and tourism data regarding the lake while the visitors are able to access this information in the form of photos and videos. This process is illustrated in Figure 2.

3.2.2. Activity Diagram

This process illustrates the series of the activity constructed in operation. It also functions to assist other processes, such as use case and interaction. Figure 3 provides information regarding the process of the activity diagram; see the details of the data regarding the management of the lake area (administrator).

3.2.3. Sequence Diagram

This diagram indicates the object's behavior in the use case by describing the object's lifetime and message, delivered and accepted between the objects. Figure 4 is the scenario of details on lake management information (administration).

3.3. System Implementation

The information system of Limboto Lake is created by using the Sublime Text as the script writing medium of PHP. Meanwhile, the database employs the MySQL server, and software testing utilizes the white-box and black-box testing.

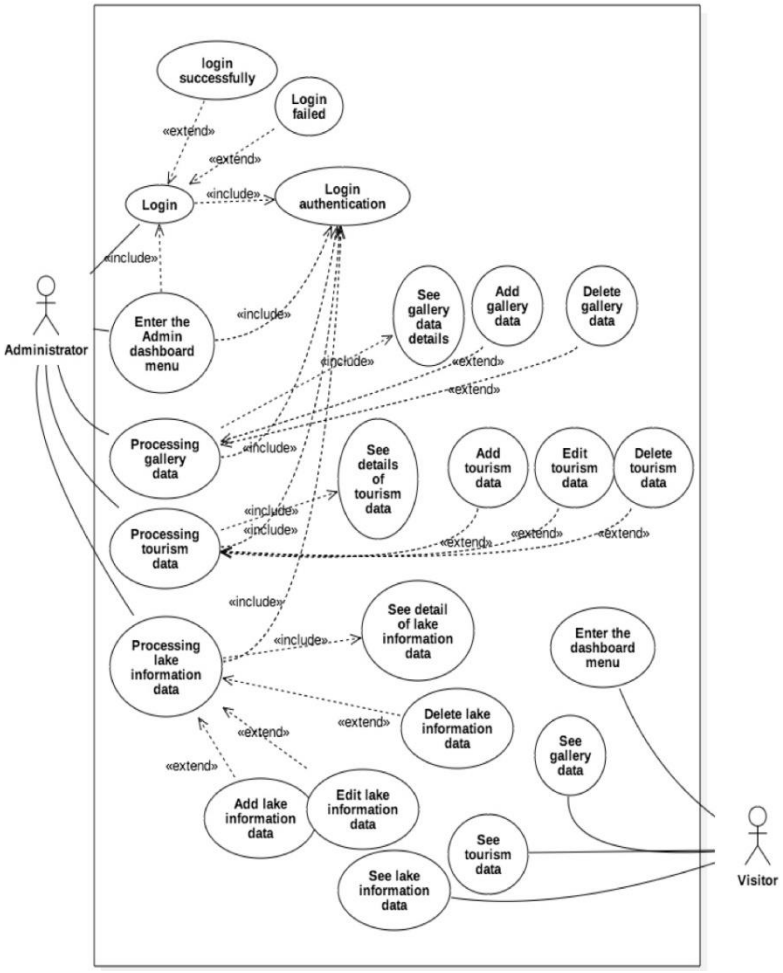


Figure 2. Use case diagram information system of Limboto Lake potential management

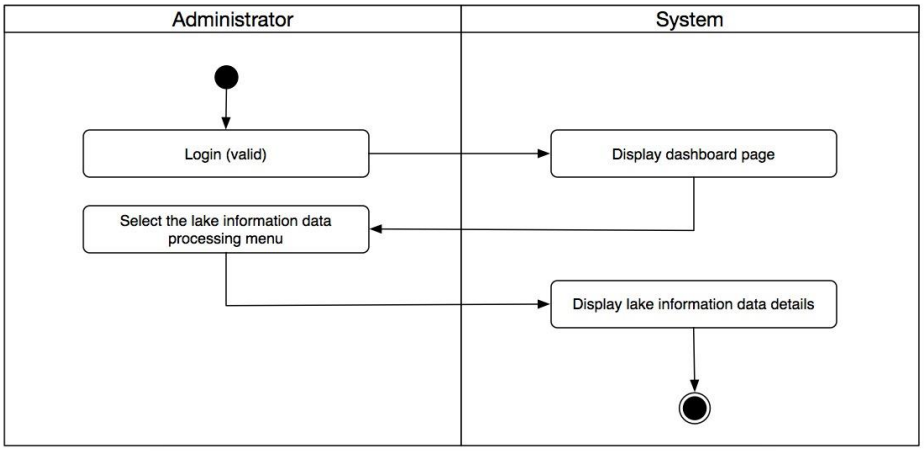


Figure 3. Activity diagram

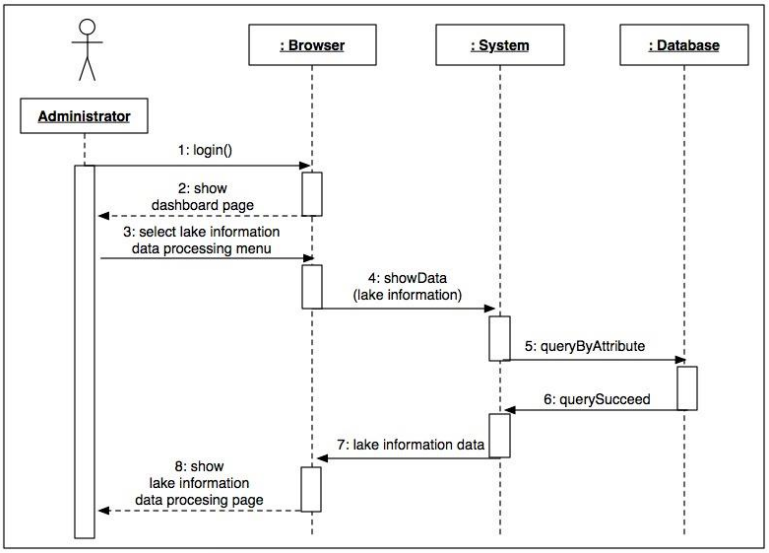


Figure 4. Sequence diagram

3.4. Operation and Maintenance

Based on the results of white-box testing in the article menu in which V(G) = 5 and Cyclomatic Complexity (CC) = 5, it is concluded that the flowchart article menu is running effectively and efficiently. Further, the result of black-box testing, i.e., system testing reaches the expected result. Therefore, this system is able to be implemented in the site area.

3.4.1. Interface

The user interface is very significant to meet the criteria, easy to use, attractive, and comfortable for the user. Interface design is intended to show the form of software that is going to be established based on the created system structure. Such a design includes menu structure, input, and output designs.

3.4.2. User Page Interface Design (Main Page)

The menu design is used to facilitate the established website search. The menu display in the information system of the management of the potential area of Limboto Lake is presented in Figure 5. This is the first page shown after entering the website address. It contains the whole menu. The menu consists of Home, Gallery, Tourism, Information, and Login. Each of the menus also has the sub-menu.

Figure 5. Main page

3.4.3. White-box Testing

The article flowchart form in the information system of the management of the potential area of Limboto lake is presented in Figure 6 and article flowgraph form in Figure 7.

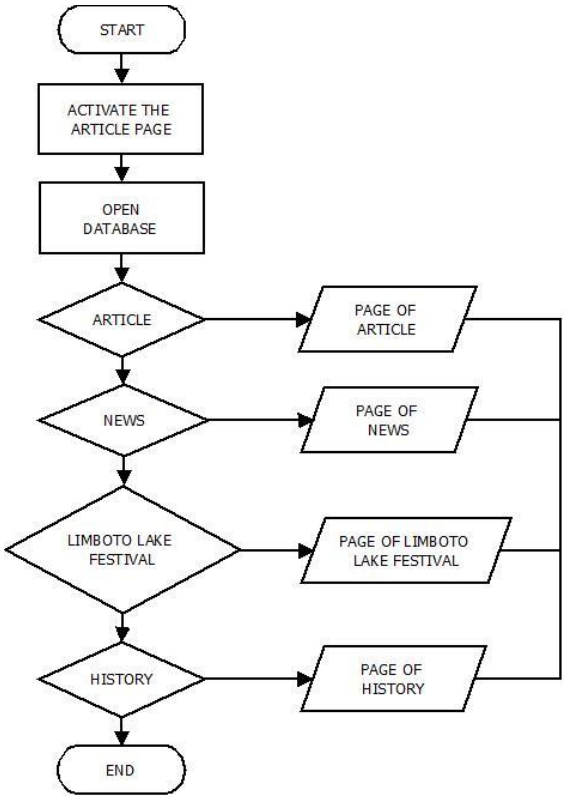


Figure 6. Article flowchart form

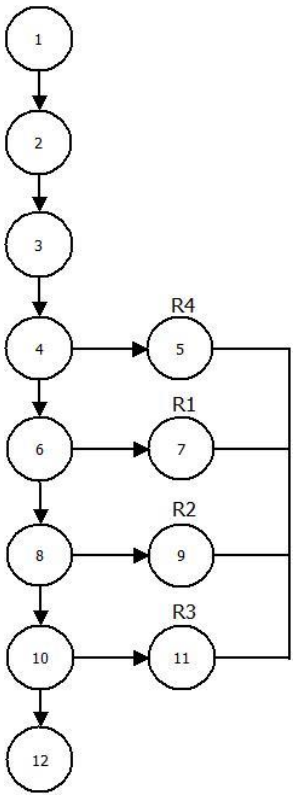


Figure 7. Article flowgraph form

Pseudecode:

- Node 1 : Start
- Node 2 : Activate the article page
- Node 3 : Open the database
- Node 4 : Select Article, if not, go to node 6, if yes, go to node 5
- Node 5 : The article page is displayed
- Node 6 : Select News, if not, go to node 8, if yes, go to node 7
- Node 7 : The News Page is Displayed
- Node 8 : Select Limboto lake festival, if not, go to node 10, if yes, go to node 9
- Node 9 : The page of Limboto lake festival is displayed
- Node 10 : Select History, if not, go to node 12, if yes, go to node 11
- Node 11 : History page is displayed
- Node 12 : End

The calculation of Cyclomatic Complexity:

- Region (R) = 4
- Node (N) = 12
- Edge (E) = 15
- Predicate Node (P) = 4

Cyclomatic Complexity (V (G)) = E – N + 2

where E = 16, N = 12

(V (G)) = E – N + 2

= 15 – 12 + 2

= 5

Clomatic Complexity (V (G)) = P + 1
where P = 4
(V (G)) = 4 + 1
= 5
Cyclomatic Complexity (V (G))
R1, R2, R3, R4 = 4
The calculation result of Cyclomatic Complexity for flowgraph in the process of filling out information is 5. The independent path is:
Path 1: 1-2-3-4-6-8-10-12
Path 2: 1-2-3-4-5
Path 3: 1-2-3-4-6-7
Path 4: 1-2-3-4-6-8-9
Path 5: 1-2-3-4-6-8-10-11
The result of white-box testing reveals that the flowchart is correct. This result signifies that the system is running very well and is feasible to be used.

3.4.4. Black-box Testing

The black-box method is employed to test this system, and it focuses on the functional software requirements as shown in Table 1.

Table 1. Black-box Testing

Input / Even	Function	Expected Results	Test Results
Open the website	Display the home	Home displayed	fit
Click the gallery menu	Display the gallery sub menu	The gallery menu displayed	fit
Select photo gallery	Display the page gallery photo	The gallery page photos displayed	fit
Select video gallery	Display the page gallery video	The gallery page video displayed	fit
Click the tourism menu	Display the tourism sub menu	The tourism menu displayed	fit
Click the information menu	Display the information sub menu	The information menu displayed	fit
Select article	Display the article menu	The article displayed	fit
Select news	Display the news menu	The news displayed	fit
Select Limboto lake festival	Display the Limboto lake festival	The Limboto lake festival page displayed	fit
Select history	Display the page history	The page history displayed	fit
Select login	Display the page login	The page login displayed	fit

4. Conclusion

The information system of the management of the potential area of Limboto Lake can facilitate the community to have information regarding the management of the potential area of Limboto Lake, Limboto lake festival, and other information about Limboto Lake and Gorontalo Province. This system is also able to facilitate the community and government of Gorontalo Regency in promoting activities and information of Limboto Lake. Since the information is already on the website, it can be easily accessed.

References

[1] Joniak T, Jakubowska N, Szeląg-Wasielewska E. Degradation of the Recreational Functionsof Urban Lake: A Preliminary Evaluationof Water Turbidity and Light Availability (Strzeszyńskie Lake, Western Poland). *Polish Journal of Natural Sciences.* 2013; 28(1): 43-51.
[2] Trisakti, B. Study of Methods for Determining Lake Water Surface Area and Distribution of Water Vegetation Based on Remote Sensing Satellite Data. *Jurnal Limnotek*. 2013; 20(1): 1-7.
[3] Mitra A, Fazli P, Zaman S, Pramanick P, Mitra A. Lakes and Their Origin. *Researchgate*. 2014: 1-7.
[4] Suryono T, Sunanisari S, Mulyana E, Rosidah. Fertility and Pollution Level of Lake Limboto, Gorontalo (in Indonesia: Tingkat Kesuburan dan Pencemaran Danau Limboto, Gorontalo). *Oseanologi dan Limnologi di Indonesia*. 2010; 36(1): 49-61.
[5] Marganof. Water Pollution Control Model in Maninjau Lake, West Sumatra (in Indonesia: Model Pengendalian Pencemaran Perairan di Danau Maninjau, Sumatera Barat). Dissertation. Bogor: Sekolah Pasca Sarjana Institut Pertanian Bogor; 2007.

[6] Lehmusluoto P, Machbub B. National Inventory of the Major Lakes and Reservoirs in Indonesia. Helsinki: Department of Lymnology and Eviromental Pretection University of Helsinki Faculty of Agriculture and Forestry. 1997.
[7] JICA. The Study on Flood Control and Water Management in Limboto-Bolango-Bone Basin in the Republic of Indonesia. Japan: Nikken Consultants Inc and Nippon Koei Co LTD. 2002.
[8] Subehi L, Wibowo H, Jung K. Characteristics of Rainfall-Discharge and Water Quality at Limboto Lake, Gorontalo, Indonesia. *J. Eng. Technol. Sci.* 2016; 48(3): 288-300.
[9] Lihawa F, Mahmud, M. Evaluation of Water Quality Characteristics of Lake Limboto (in Indonesia: Evaluasi Karakteristik Kualitas Air Danau Limboto). *Jurnal Pengelolaan Sumberdaya Alam dan Lingkungan*. 2017; 7(3): 260-266.
[10] Banteng B, Hasim, Bumulo F. Perception of Coastal Society on Ecological Damage of Limboto Lakes. *Jurnal Lingkungan dan Pembangunan*. 2015; 1(3): 289-296.
[11] Saleh SE, Baiquni M, Yunus HS. Determinants of Socio-Demography and Household Livelihood (A Study in Iluta and Limehe Timur Village, Gorontalo Regency). *International Journal of Scientific and Research Publications*. 2016; 6(5): 627-633.
[12] BPDAS-BB, Technical Planning for Land Rehabilitation and Soil Conservation for Limboto Watershed (Book 1). Gorontalo: BPDAS-BB Gorontalo. 2004.
[13] Hidayat GG, Kakizawa H. Development Process of Watershed Partnership: a Case Study of Limboto Watershed - Gorontalo, Indonesia. *Journal of Forestry Research*. 2014; 1(1): 9-20.
[14] BALITBANGPEDALDA. Regional Environmental Status, Gorontalo Province Year 2005. Gorontalo: Balitbangpedalda Provinsi Gorontalo. 2006.
[15] Amali LN, Mahmuddin M, Ahmad M. Information Technology Governance Framework in the Public Sector Organizations. *TELKOMNIKA Telecommunication Computing Electronics and Control*. 2014; 12(2): 429-436.
[16] Hall J. Accounting Information System, 4th Ed. Jakarta: Salemba Empat. 2011.
[17] Alter S. Defining Information Systems as Work Systems: Implications for the IS Field. *European Journal of Information Systems*. 2008; 17: 448-469.
[18] Raza K, Patle VK, Arya S. A Review on Green Computing for Eco-Friendly and Sustainable IT. *Journal of Computational Intelligence and Electronic Systems*. 2012; 1: 1–14.
[19] Massie R. Beyond. Document Management. Boston: Accounting Technology. 2008.
[20] Robert EM, Nita GB, Thomas WJ, Lee W. Information Systems Service Quality: An Examination of User Expectations. *American Journal of Business*, 2008; 23(2): 37–42.
[21] Kassim ES, Jailani SFAK, Hairuddin H, Zamzuri NH. Information System Acceptance and User Satisfaction: The Mediating Role of Trust. *Procedia*. 2012; 57: 412–418.
[22] Al-Sudairy MT, Vasista TGK. Semantic Data Integration Approaches for E-Governance. *International Journal of Web & Semantic Technology* (*IJWesT)*. 2011; 2(1): 1-12.
[23] Wang Y, Shi Q, Song H, Li Z, Chen X. Multi-source Heterogeneous Data Integration Technology and Its Development. *The International Conference on Promotion of Information Technology*. 2016: 0133- 0138.
[24] Barjtya S, Sharma A, Rani U. A Detailed Study of Software Development Life Cycle (SDLC). *International Journal of Engineering and Computer Science (IJECS)*. 2017; 6(7): 22097-22100
[25] Rastogi, V. Software Development Life Cycle Models-Comparison, Consequences. *International Journal of Computer Science and Information Technologies*. 2015; 6(1): 168-172.