ICAKMPET

IFERP Academy

5th International Conference on
Advancing Knowledge from Multidisciplinary Perspectives in Education, Engineering & Technology

ICAKMPET 2025

24th-25th January, 2025
Cebu, Philippines

Organized by:

Bohol Island State University - Philippines,
Eurasian Doctoral Student Academy - London, United Kingdom,
Western Philippines University - Philippines,
Nueva Ecija University of Science and Technology - Philippines,
& IFERP Academy - Philippines Society.

ICAKMPET

5th International Conference on Advancing Knowledge from Multidisciplinary Perspectives in Education, Engineering & Technology - 2025, Cebu, Philippines

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ICAKMPET 2025
THEME

"Reshaping the Future:
Education, Engineering,
and Technology for
Sustainable Societies"

Preface

We are delighted to extend a warm welcome to all participants attending 5th International Conference on Advancing Knowledge from Multidisciplinary Perspectives in Engineering & Technology (ICAKMPET-2025) organized by Bohol Island State University (Philippines), Eurasian Doctoral Student Academy (London, United Kingdom), Western Philippines University (Philippines), Nueva Ecija University of Science and Technology (Philippines) and IFERP Academy-Philippines Society taking place in Cebu, Philippines on January 24th-25th, 2025. This conference provides a vital platform for researchers, students, academicians, and industry professionals from all over the world to share their latest research results and development activities in the field of Engineering & Technology. It offers delegates an opportunity to exchange new ideas and experiences, establish business or research relationships, and explore global collaborations.

The proceedings for ICAKMPET-2025 contain the most up-to-date, comprehensive, and globally relevant knowledge in the field of Engineering & Technology. All submitted papers were subject to rigorous peer-reviewing by 2-4 expert referees, and the papers included in these proceedings have been selected for their quality and relevance to the conference. We are confident that these proceedings will not only provide readers with a broad overview of the latest research results in Engineering & Technology but also serve as a valuable summary and reference for further research in this field.

We are grateful for the support of many universities and research institutes, whose contributions were vital to the success of this conference. We extend our sincerest gratitude and highest respect to the many professors who played an important role in the review process, providing valuable feedback and suggestions to authors to improve their work. We also extend our appreciation to the external reviewers for providing additional support in the review process and to the authors for contributing their research results to the ICAKMPET-2025.

Since September 2024, the Organizing Committees have received more than 200+ manuscript papers, covering all aspects of ICAKMPET-2025. After review, approximately 90+ papers were selected for inclusion in the proceedings of ICAKMPET-2025. We would like to thank all participants at the conference for their significant contribution to its success.

We express our gratitude to the keynote and individual speakers and all participating authors for their dedication and hard work. We also sincerely appreciate the efforts of the technical program committee and all reviewers, whose contributions made this conference possible. Finally, we extend our thanks to all the referees for their constructive comments on all papers, and we express our deepest gratitude to the organizing committee for their tireless work in making this conference a reality.

About **ICAKMPET 2025**

In the ever-evolving landscape of engineering and technology, the 5th International Conference on Advancing Knowledge from Multidisciplinary Perspectives in Education, Engineering & Technology (ICAKMPET-2025), Organized by Bohol Island State University, Philippines, Eurasian Doctoral Student Academy,London,United Kingdom,Western Philippines University, Philippines and IFERP Academy - Philippines Society emerges as a catalyst for innovation, collaboration, and knowledge exchange. Set to take place on January 24th and 25th, 2025 in the vibrant city of Cebu, Philippines ICAKMPET-2025 beckons professionals, researchers, and academics from around the world to participate in a transformative experience.

Multidisciplinary Confluence

ICAKMPET-2025 stands as a melting pot of ideas, where the boundaries between engineering disciplines blur, giving rise to innovative solutions that address global challenges. The conference embraces the multidisciplinary nature of contemporary research, recognizing that true breakthroughs often occur at the intersections of different fields.

This theme encapsulates the conference's focus on fostering innovation and collaboration across diverse disciplines within engineering and technology. It encourages participants to explore and present cutting-edge solutions that contribute to the sustainable development of industries, addressing challenges and advancing knowledge for a better future. The multidisciplinary perspective highlights the interconnectedness of various fields in creating holistic and impactful solutions.

About **IFEERP Academy**

T he IFERP Academy - Philippines Society is a professional association devoted to the advancement of the fields of engineering, science, and technology through the funding of research activities, propagation of the latest research insights, furtherance of industry trends, and other related ventures. IFERP aims to digitalize this entire process of innovation, collaboration, and knowledge-sharing through the fostering of a unified virtual scientific community worldwide. Everything from networking and joint ventures to learning, research assistance, publication, and more, will be carried out as part of this objective.

IFERP has established robust scientific, academic, and industry networks throughout Asia, the Middle East, and Europe. Some of the countries that IFERP has its presence in, include Iraq, Maldives, Thailand, Malaysia, Singapore, Philippines, Indonesia, Taiwan, Vietnam, UAE, Australia, Japan, Sri Lanka, Nepal, Ghana, and Africa.

Mission & Vision

Mission : "Upskilling the knowledge hub through technological innovation and excellence for the benefit of humanity"

Vision : "A Digitally equipped robust, dynamic & swift professional community integrating academics & industry for upgraded technical knowledge implementation."

What We Do?

- IFERP believes that there is always a better way to treat the professionals by providing them a world class stage by organizing conferences. We are committed to doing the following activities:-
- We encourage convenient access to academic resources and support for all the aspirants and research scholors in urban and rural areas.
- IFERP organizes public education programmes, Workshops, Conferences, Webinars, Seminars, Guest Lectures, Short Term Training Programme, Faculty Development programme in the field of Engineering, Science & Technology.
- IFERP is dedicated to inquisitiveness, innovations and recent trends and developments in the field of Engineering & Technology.
- IFERP believes in knowledge sharing by collaborating with other Universities, organizations/Associations, to bring a better tomorrow.

About Our Academic Partners

The Bohol Island State University

The Bohol Island State University (BISU), the first and only state university in the Province of Bohol, is a conversion by operation of law, RA 8659 to RA 9722, with the title: "An Act Converting the Central Vtsayas State College of Agriculture, Forestry and Technology (CVSCAFT), Its Units and Satellite Campuses in the City of Tagbilaran and in the Municipalities of Bilar, Candijay, Clarin, Calape, and Balilihan, all located in the Province of Bohol to be known as the Bohol Island State University (BISU) and Appropriating Funds Therefor', on October 14, 2009, by President Gloria Macapagal Arroyo.

The Nueva Ecija University of Science and Technology (NEUST)
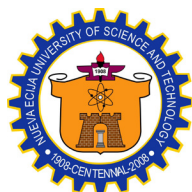
The Nueva Ecija University of Science and Technology (NEUST) started in June, 1908 as a vocational course at the Wright Institute in San Isidro, Nueva Ecija where young Filipinos were trained in woodworking and basic telegraphy. Said vocational course lasted until SY 1927-1928 when the general secondary school was transferred to Cabanatuan City.

However, on June 9, 1929, the school continued its operation in San Isidro, under a new name, Nueva Ecija Trade School (NETS) with woodworking as the vocational course offered in addition to the existing secondary curriculum inherited from the Wright Institute.

The Western Philippines University

The Western Philippines University is a state higher education institution located at Aborlan, Palawan. The University began as the Aborlan Farm Settlement School for the Tabanuas (an indigenous cultural community of Palawan) in 1910. It became the Aborlan Agricultural High School in 1928, and the Palawan Regional Agricultural School in 1960. It was renamed Palawan National School in 1962, and became the Palawan National Agricultural College. Its name was again changed to State Polytechnic College of Palawan in 1995 by virtue of RA 8012, and in 2004 President Gloria Macapagal-Arroyo signed the RA 9260 converting it to Western Philippines University.

Eurasian Doctoral Student Academy (EDSA)

Eurasian Doctoral Student Academy (EDSA) was founded and established as an academic initiative with the view of assisting Doctoral Candidates, encompassing both Ph.D. and DBA. The idea is to equip the candidates with tools for ensuring a high quality of their thesis in compliance with sound scientific method. This is particularly the case where there exist differences in the way post-graduate studies are conducted in countries other than those of the Anglo-American academic traditions.

One of the main objectives of Eurasian Doctoral Student Academy (EDSA) is to narrow these differences, and work towards a cohesive standardized and universally accepted code and conduct of research. This goal facilitates further dissemination of scientific work, as they enjoy generally accepted research methods, in top tier journals and as monographs with reputable publishing houses.

Message From
Managing Director, IFERP Academy

Mr. A. Siddth Kumar Chhajer

Managing Director & Founder
IFERP Academy, Technoarete Groups

On behalf of Institute For Educational Research and Publications (IFERP) & the organizing Committee, I express my hearty gratitude to the Participants, Keynote Speakers, Delegates, Reviewers and Researchers.

The goal of the 5th International Conference on Advancing Knowledge from Multidisciplinary Perspectives in Engineering & Technology (ICAKMPET-2025) is to provide knowledge enrichment and innovative technical exchange between international researchers or scholars and practitioners from the academia and industries in the field of Engineering, Technology.

This conference creates solutions in different ways and to share innovative ideas in the field of Engineering, Technology. ICAKMPET-2025 provides a world class stage to the Researchers, Professionals, Scientists, Academicians and Students to engage in very challenging conversations, assess the current body of research and determine knowledge and capability gaps.

5th International Conference on Advancing Knowledge from Multidisciplinary Perspectives in Engineering & Technology (ICAKMPET-2025) will explore the new horizons of innovations from distinguished Researchers, Scientists and Eminent Authors in academia and industry working for the advancements in Science and Engineering from all over the world. ICAKMPET-2025 hopes to set the perfect platform for participants to establish careers as successful and globally renowned specialists in the field of Engineering, Technology.

Message From
CEO, IFERP Academy

Mr. Rudra Bhanu Satpathy

CEO & Founder
IFERP Academy, Technoarete Groups

IFERP is hosting the 5th International Conference on Advancing Knowledge from Multidisciplinary Perspectives in Engineering & Technology (ICAKMPET-2025) this year in month of January, 2025. The main objective of ICAKMPET-2025 is to grant the amazing opportunity to learn about groundbreaking developments in modern industry, talk through difficult workplace scenarios with peers who experience the same pain points and experience enormous growth and development as a professional. There will be no shortage of continuous networking opportunities and informational sessions. The sessions serve as an excellent opportunity to soak up information from widely respected experts.

Connecting with fellow professionals and sharing the success stories of your firm is an excellent way to build relations and become known as a thought leader. I express my hearty gratitude to all my Colleagues, Staffs, Professors, Reviewers and Members of Organizing Committee for their hearty and dedicated support to make this conference successful. I am also thankful to all our delegates for their pain staking effort to make this conference successful.

Guest of Honor

Dr. Marilyn Morales Obod

Dean of the Graduate School,
Head, Research Development and
Publication Office, World Citi Colleges
Quezon City , Philippines

Dr. Sarah C. Alvarez

Dean, College of Management and
Business Technology, Neuva Ecija
University of Science and Technology
Philippines

About Keynote Speaker

Dr. Ralph Vendel

Faculty, Social Sciences & Graduate School, University of Science and Technology of Southern Philippines, Philippines

Dr. Musni is an Outstanding Professional by Instabright International, Vice President for External Affairs of Career Counselor & Advocates Region X and Faculty, the Social Sciences Unit and the Graduate School of University of Science and Technology of Southern Philippines, a Career Service Eligible for both Professional and subprofessional by the Civil Service, Registered Psychometrician, Licensed Guidance Counselor, and Professional Teacher by the PRC, NC II (Top1) & NC III holder of TESDA and finished the following degrees with scholarship: Doctor of Education Management, Master of Arts in Guidance & Counseling, Master in Business Administration – Human Resources, Bachelor of Science in Psychology with Professional Education. He also finished a Diploma in Human Resources and other Specialized Courses in Technology in Teaching and Learning & Understanding the Child Better by the University of the Philippines Open University, Managing Emotions in Times of Uncertainty by Yale University, and Universal Treatment Curriculum for Substance Use Disorder by Ateneo de Davao University & the U.S. Department of State.

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Explore Your Research Journey...

About Keynote Speaker

Dr. Rhodora R. Jugo

University President
Nueva Ecija University of Science and
Technology, Philippines

Dr. Rhodora R. Jugo is a globally-minded and transformative leader and educator, proficient in inspiring and guiding employees to reach their full potential and bring about meaningful change and outstanding outcomes. With exceptional communication skills, she effortlessly cultivates positive and constructive relationships with students, parents, faculty, and administrators. Recognizing the importance of diverse skill sets and learning styles, she effectively tailors her approach to provide optimum support for individual growth. A devoted advocate for Global Citizenship Education (GCED), she actively promotes its principles and practices throughout her work. As a strong and influential woman, she leads by example and lives with unwavering passion and purpose, acting as a catalyst for change and igniting inspiration within others. Her sphere of influence extends to creating inclusive, collaborative, and empowering work environments that shine a spotlight on everyone's success and achievements.

About Keynote Speaker

Dr Cameron A. Batmanghlich

Founder and Non-Executive President
Eurasian Doctoral Student Academy
(EDSA), Sweden

Prof. Batmanghlich is a full professor of Corporate Leadership and Ethics. He was awarded his full Profes-sorship in 2014, from four different institutions. Professor Batmanghlich has a strong international back-ground having lived and worked in over eleven different countries in Europe, Asia, Middle East, South America, The Caribbean, China, Central Asia, and Sub-Sahara Africa. He has held positions as the Dean of various business schools around the world, been a former President of a private university in Malta as well as the Deputy Dean and Director of the MBA department at the top business school in C. Asia. He is a frequent keynote speaker at various international conferences and is a of member of various scientific associations, among them the Paris Research in Norms Management and Law (PRIMAL) within 'Corporate Social Responsibility and Social Accountability' research group, Sopot Scientific Association, in Poland, as well as a permanent member of several scientific peer-reviewed journals based in countries such as U.K., France, Canada, Mexico, India and Poland.   His seminal monograph on leadership called 'Why Leaders Fail Ethically, and published by Springer, has been sold and downloaded over 12000 copies. Prof. Batmanghlich is engaged in consulting other higher educations in international accreditation, internationalization and design of new academic programs.

About Keynote Speaker

Dr. Thelma D. Palaoag, Director of the Innovation and Technology Transfer Office of the University of the Cordilleras, she is a visionary leader, accomplished researcher, and trailblazer in the field of Information Technology (IT). With an unwavering commitment to advancing technological frontiers, she has dedicated her career to pushing the boundaries of IT research and fostering innovation within academic institutions.

Dr. Thelma Domingo Palaoag

Professor, College of Information Technology and Computer Science
University of the Cordilleras,
Philippines

About Session Speaker

Dr. Surbhi Saroha

Shobhit University
India

Ms. Surbhi Saroha is currently serving as an Assistant Professor in the Computer Science department at Shobhit University, Meerut. She has over 10 years of teaching experience, having worked in schools, colleges, and universities. In addition to her academic career, she runs her own YouTube channel under her name, Surbhi Saroha, and maintains a blog called 'pehu-motivation.blogspot.com.' She has also uploaded 100 PowerPoint presentations on SlideShare. Furthermore, she has written 3 books, which are available on platforms like Amazon, Flipkart, etc.

About Session Speaker

Dr. Shazmin Shareena Ab Azis

Senior Lecturer Real Estate, Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, Malaysia

A full time Real Estate senior lecturer at Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia. Did a post-doctoral fellowship at Universiti Teknologi Malaysia. Doctor of Philosophy Degree in Real Estate, Bachelor Degree in Property Management, and Diploma in Valuation from Universiti Teknologi, Malaysia. A Member of Royal Institution of Surveyor Malaysia (MRISM) and Malaysian Institute of Property & Facility Managers (MIPFM). Area of expertise and research interests include real estate sustainability, property appraisal, green building, environmental economics, cost-benefit, local government taxation, and building energy. Project leader for several research grants and consultancy projects. Published books and academic papers on various research interests particularly green roof, urban flash flood management, green building, building energy saving and also present academic papers at both local and international conferences. Editorial board member for several journal including Web of Science indexed journal. Awarded as Young Researcher Icon in 2022 by Universitl Teknologi Malaysia. Visiting lecturer for several international and local universities. A curriculum committee member and head in academic syllabus module development for Real Estate undergraduate programme in Universiti Teknologi Malaysia. Teaches several subjects at university including real estate sustainability, real estate economic analysis, urban land economics, and town and country planning modules for undergraduate courses.

About Session Speaker

Dr. Suresh D. Mane

Principal
D Y Patil Prathsthan's College of
Engineering, India

Dr. Suresh D. Mane is a seasoned academic with expertise in multidisciplinary engineering. Heading AICTE-approved engineering colleges since 2015, he oversees academics and administration while guiding the institution through its NAAC Cycle 1 accreditation process. His research interests span accreditation, OBE, SDGs, solar PV, IC engines, and biofuels. He has contributed significantly to the field through his work on biodiesel manufacturing, characterization, and performance testing on both direct injection and CRDi engines, with research findings presented at international conferences like ICAER. A certified energy manager and auditor, Dr. Mane has held principal positions at prestigious institutions like Dr. D. Y. Patil Prathisthan College of Engineering, Girijabai Sail Institute of Technology, and Shaikh College of Engineering & Technology.

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About Session Speaker

Dr. Anjum Parveen Nazir Qureshi

Electronics & Communication Engineering, Rajiv Gandhi College of Engineering Research & Technology, India

Dr. Anjum Nazir Qureshi, is working as Assistant Professor in the department of Electronics & Communication Engineering at Rajiv Gandhi College of Engineering Research & Technology, Chandrapur. She is a certified life coach, motivational speaker and certified meditation trainer. She has published 20+ research papers, 3 patents, 26 articles and authored 5 book chapters. She is author of a book "10 Core Life Skills". She has been evaluator for grand finale of Toycathon-2021 and prescreening round of Smart-India Hackathon 2022 organized by Ministry of Education and AICTE. She has received awards like Educational Excellence Award, Young Educator and Researcher Award, Best Woman Faculty Award and has been listed among the Top 50 influential Researchers in Indian higher Education for the year 2020. She has been a resource person for many seminars and workshops for school and college students. She has conducted trainings at district level and national level. She has worked for two international documentary films of UNICEF.

About Session Speaker

Dr. Feliciana P. Jacoba

Vice President for Academic Affairs
Nueva Ecija University of Science and
Technology, Philippines

Dr. Feliciana Pascual Jacoba has a humble beginning as an educator and as a Licensed Mechanical Engineer. She has held several key positions in the university notably as SUC President III, Vice President III, VP for Research, Extension and Training, Officer-in-Charge of the College of Industrial Technology and Dean of the Graduate School. She has served as Chair of Mechanical Engineering Department, Bids and Awards Committee for Goods and Services and Infrastructure, Over-all Review Committee on PBB and Research Technical Committee. In addition, she also served as the Secretary of the NEUST Governing Board. At present, she is the Vice President for Academic Affairs. She holds the following degrees to wit: Doctor of Education, major in Vocational Technological Education, Master in Engineering Education, major in Mechanical Engineering and BS in Mechanical Engineering (Cum Laude), all from the Nueva Ecija University of Science and Technology. She has been a member of different professional organizations in which she keeps a lifetime membership at the Phil Society of Mechanical Engineers; Board of Trustee of the Pambansang Samahan ng Inhenyero Mekanikal, Chair of the Multi Sectoral Governance Council of the AFP Special Operations Command and Dr. Paulino J. Garcia Memorial Research and Medical Center, member of the Philippine Association of State Universities and Colleges, among others. She is a recipient of various awards, recognition and appreciation. She was awarded as "Natatanging Anak ng Cabanatuan" and Outstanding Woman in National Development by the Cabanatuan City Government. Just recently, she was awarded as "2024 Outstanding Government Worker (SOGW)" by the Civil Service Commission- Regional Office III. Further, she has been invited as resource speaker, consultant, and paper presenter in different fora and symposia in national and international arena. She is a daughter of Mr. and Mrs. Benito and Remedios Pascual. As the old adage goes, behind the success of a woman is a man. She is happily married to Mr. Danilo Maano Jacoba. Her greatest source of inspiration are her three kids Patrice Kyla, Lance Adrian, and Danielle Ira.

About Session Speaker

Dr. Allen Paul Esteban

Chair, Research, Extension, & Training Office, Graduate School, Nueva Ecija University of Science and Technology Philippines

DR. ALLEN PAUL ESTEBAN is an Assistant Professor IV at the Graduate School of Nueva Ecija University of Science and Technology. He holds a Doctorate Degree in Information Technology and has earned multiple awards in recognition of his outstanding contributions to the field. As a dedicated professional, he received the title of Scientific and Technological Specialist from the Department of Science and Technology. With a passion in Research-based Information Technology solutions, he holds the title of Microsoft Technology Associate and Certified Microsoft Innovative Educator, a testament to his mastery in the world of technology. As an integral part of the academic community, Mr. Allen Paul dons multiple hats. He serves as an IT instructor at NEUST and assumes the mantle of Research, Extension, and Training Chairperson of the Graduate School Department. He is also appointed as the University Focal Person in the National Library of the Philippines. Demonstrating his commitment to excellence, he is an active Associate Member of the National Research Council of the Philippines. His editorial prowess shines through as well, as he holds the position of Managing Editor and Editor-in-Chief of "The Quest: Journal of Multidisciplinary Research and Development", the first indexed online research publication in NEUST. This journal is currently indexed in Google Scholar, Crossref International, and other indexing systems. With this achievement, he was invited to be a member of the paper reviewers of the Philippine Society of Information Technology Educators, and appointed as Managing Editor of Graduate Education Association of Public Higher Education Institutions. He was also invited to India to deliver a keynote during the International Conference on Disruptive Technologies, and invited as session chair in International Workshop on Artificial Intelligence and Education held in Tokyo, Japan. His influence extends beyond the academic world into the field of research publication. He has made a mark in the research community by publishing articles in Scopus-indexed journals. His research contributions cover a wide array of topics, including Networks Anomaly Detection, Grid Computing Optimization and Deep Learning, and Image Processing Techniques in Agriculture. He also published a book titled, "Web Engineering & E- Commerce", available on Lulu, Amazon, Google Books, and soon in Apple Books. Sir Allen is not only passionate in Information Technology, but he also has a wonderful family that supports his endeavors. He is happily married to his wife, Liezel, and together they are proud parents to their beautiful and super cute daughter, Lil Callie. With their unwavering support, Mr. Esteban is working on a research-based system development advocating digital governance and digitizing government processes.

About Session Speaker

Dr. Heena V Sanghani

Dr. D Y . Patil Pratishthan's College of Engineering, Kolhapur, Maharashtra, India

I have a vast experience of 19 years plus with long association with the students. I have versatile experience of administration as Acting Principal, in Umang College of women SNDT Nagpur, PG Coordinator in Chemistry Department of Haribhai V Desai College of Arts Science and Commerce, as well as online teaching to overseas students. I was Assistant Professor in various departments of Chemistry and Science colleges as well as Engineering Colleges. Backed as a doctorate and Mastery in Chemistry, Applied Chemistry, and Industrial Chemistry, Polymers, Physics, Biology & basic sciences. I am a Certified & appreciated by the parents of the students in overseas and places as Pune and Nagpur. All the students in my journey are posted across top most levels of their fields including the profession of Researchers & Scientist. I would like to apply for the post of Associate Professor and any other eligible field of skill research Innovation and so on through which I serve your Institution.

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Session Chairs

Ms. Carla Marie Santos

Associate Professor (English)
National University
Philippines

Dr. Mary Chris Austria

Associate Professor, College of
Management and Business technology
Nueva Ecija university of science and
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Faculty member, College of Engineering
and Computational Science, Partido
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Mr. John Bryan Coleta Villapa

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Department of Civil Engineering
Western Philippines University Aborlan
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Program Administrator
Department of Information Technology
Education, Sto. Domingo Community
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Ms. Marilou Benoza-Lansangan

Instructor, Information Technology
Infotech Development Systems Colleges
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Dr. Sandeep Gajanan Sutar

Assistant Professor, Department of Computer Science and Engineering, Dr D. Y. Patil Pratishthan's College of Engineering, Maharashtra, India

Mr. Benjamin Haboc

College Instructors
EARIST - MANILA, Philippines

Dr. Analiza Acuña Villacorte

Professor
Department of English
Bulacan State University Bulacan
Philippines

Ms. Girlie M. Samson

Associate Professor V
Bulacan State University Bulacan
Philippines

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Explore Your Research Journey...

Session Chair & Moderators

Session Chair

Engr. Merricris U. Pangilinan

Former Program Chair
Department of Civil Engineering
Bulacan State University
Philippines

Moderator

Ms. Kryslen Serona-Benelizo

Assistant Professor,
College of Business, Bukidnon State
University Bukidnon, Philippines

Moderator

Ms. Daisy Mae Bongtiwon

Faculty of Physics and Mathematics
Eulogio Amang Rodriguez Institute
of science and technology, Manila,
Philippines

Moderator

Ms. Vivien Amor Viloria

Research Unit Chair,
CMBT.

Moderator

Mr. Alec C. De Leon

Dean,
Nueva Ecija University of Science and
Technology.

Volunteers

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Department of English Education
Bukidnon State University Malaybalay,
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Mr. Jovert J Delegencia

Instructor
Department of Business Administration
Bukidnon State University Malaybalay,
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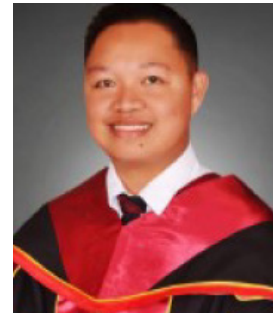
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Mr. Michael Briant T Calao

Instructor
Department of Business Administration
Bukidnon State University Malaybalay,
Philippines

Ms. Kathleen Rose Y. Jose

Associate Professor III,
Nueva Ecija University of Science and
technology

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Panel Discussion

Disscussion on

The Complete Research Cycle: From Idea to Citation – Maximizing Impact through Conferences, Publications, and Citation Boosting

Dr. Benedicto B. Balilo Jr.

Dean,
Bicol University, Albay, Philippines

Dr. Thelma Domingo Palaoag

Professor, College of Information
Technology and Computer Science
University of the Cordilleras, Philippines

Dr. Sarah C. Alvarez

Dean, College of Management and
Business Technology, Neuva Ecija
University of Science and Technology,
Philippines

Dr. Marilene C. Hipolito

Director, Research Services Department
Nueva Ecija University of Science and
Technology, Philippines

About Committee Members

Organizing Committee

CONFERENCE CHAIR

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Dean, Bicol University, Albay, Philippines

ORGANISING SECRETARY

MS. Kryslen Serona-Benelizo
Assistant Professor, College of Business, Bukidnon State University Bukidnon, Philippines

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Mr. Rodrigo Salimaco Jr.
Assistant Professor, Faculty of Computing, Data Sciences, Engineering and Technology, Davao Oriental State University Mati, Philippines

Dr. Analiza Acuña Villacorte
Professor, Department of English, Bulacan State University Bulacan, Philippines

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Associate Professor, Department of Management, UST-AMV College of Accountancy Manila, Philippines

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Board of Director, Graduate Studies, Iloilo State University of FisheriesScience and Technology Dingle Campus Iloilo, Philippines

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Associate Professor, Department of Management, University of Batagas Batagas, Philippines

Dr. Sunny Joseph Kalayathankal
Professor & Dean, Department of computer science and engineering, Jyothi Engineering College Kerala, India

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Associate Professor, Department of Computer Studies, Quezon City University Manila, Philippines

Ms. Susan Diosalan
Program chair, Department of Education, Capiz state University Capiz, Philippines

Dr. Parames Chutima
Professor, Department of Manufacturing Engineering, University of Nottingham Nottingham, Thailand

Mr. Richard Colasito
Professor, Department of computer science, Bicol university Albay, Philippines

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Program Administrator, Department of Information Technology Education, Sto. Domingo Community College Sto. Domingo, Albay, Philippines

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Associate Professor, College of Management and Business Technology, Nueva Ecija university of science and technology Cabanatuan City, Philippines

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Associate Professor, Department of Mechanical Engineering, University of Malaya Kuala Lumpur, Malaysia

Dr. Suresh D. Mane
Principal, Department of Mechanical Engneering, DY Patil College of Engineering Mumbai, India

Dr. Vaishali Dhingra
Dean & Professor, Department of Commerce and Management, RAMA University Uttar Pradesh, India

Review Committee

Dr. H. N. M. Ekramul Mahmud
Associate Professor, Department of Chemistry, University of Malaya Kuala Lumpur, Malaysia

Dr. Amit Bindaj Karpurapu
Professor & Head, Department of Electronics and Communication Engineering, Swarna Bharathi Institute of Science & Technology (NAAC) Telangana, India

Dr. Shaik Qadeer
Professor, Department of Electronics and Communication Engineering, MJ College of Engineering and Technology Telangana, India

Dr. Jemmarie G. Suetos
Assistant Professor, Department of Agricultural Science, Mariano Marcos State University Batac, Philippines

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Abstracts **Index**

Characterization and Analysis of Tension Parallel Properties in *Bambusa blumeana*-A Study of Bamboo's Mechanical Strength for Structural Application

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The dissertation showcased the comprehensive exploration of a specific bamboo species, Bambusa blumeana, the mechanical properties specifically focusing on its tension parallel characteristics. The study employs a rigorous methodology, including one-way analysis of variance, t-test, and multiple linear regression as statistical treatment methods, to characterize tension parallel properties of Bambusa blumeana. By subjecting bamboo specimens, Bambusa blumeana, Bambusa vulgaris, and Dendrocalamus asper, to controlled tension forces, the research team meticulously analyzes a key mechanical parameter: tensile parallel strength to fiber. The findings enhanced understanding on its potential applications in various structural contexts. The results suggest that both Dendrocalamus asper and Bambusa vulgaris contain higher allowable tensile strength compared to Bambusa blumeana. This then indicates that Dendrocalamus asper and Bambusa vulgaris emerge as a material with their tensile parallel strength mechanical attributes. The study outcomes presented herein aim to inform future research endeavors and inspire innovative bamboo applications in structural engineering.

Index Terms

Bambusa blumeana Mechanical Properties, Structural Applications, Tension Parallel Properties

Application of Cognitive Load Theory in Interactive Multimedia to Increase Civic Education Learning Engagement

Jimmy Novenaldi, *Universitas Negeri Yogyakarta, Indonesia*

Mukhamad Murdiono, *Universitas Negeri Yogyakarta, Indonesia*

This classroom action research focuses on increasing student engagement in civic education through cognitive load theory and interactive multimedia. Strategies include structured group discussions, problem-based learning, and others. The results showed an increase in student involvement of up to 86.25%. Data analysis uses a mixture of qualitative and quantitative methods. This research is motivated by the low involvement of students in civic education. By applying the principles of cognitive load theory and interactive multimedia, hoped that it can create a more effective learning environment. Overall, this study shows the potential of this approach in improving learning effectiveness and helping students understand the concepts of citizenship, making a significant contribution to the development of more effective learning strategies.

Enhancing Leadership and Organizational Effectiveness: A Case Study of Civil Engineering Faculty

John Bryan C. Villapa, *Western Philippines University, Philippines*

This capstone project, investigates leadership dynamics and organizational culture within the Civil Engineering Department. The study aims to assess the current leadership styles, evaluate organizational culture and climate, develop communication strategies, and propose effective decision-making models to enhance team performance and overall departmental effectiveness. Additionally, the research focuses on leading organizational change initiatives and promoting ethical, innovative leadership practices. The methodology employs both qualitative and quantitative approaches, including surveys and interviews, to gather data from faculty members on leadership effectiveness, communication practices, and organizational behavior. The findings highlight the significance of transformational leadership in motivating faculty and fostering a positive organizational climate, while also identifying areas for improvement in participative leadership and communication strategies. Barriers to innovation and challenges related to decision-making processes are also explored, leading to recommendations for fostering an inclusive, dynamic environment that supports academic excellence and faculty development. The results of this study contribute to the ongoing discourse on leadership in higher education, particularly in engineering faculties, offering insights for optimizing leadership practices and organizational performance. The proposed changes aim to enhance leadership capacity, foster collaboration, and create a supportive culture that drives innovation and academic success within the Civil Engineering Department.

Index Terms

Leadership, Organizational Effectiveness, Civil Engineering, Academic Development, Decision-Making, Communication Strategies, Transformational Leadership

ICAKMPET

Pull-Out Strength of Expansion Anchor Bolt Embedded in Polypropylene Fiber Reinforced Concrete

Reycielo B. Denzon, *Western Philippines University, Philippines*

Concrete is a well-known composite material valued for its high compressive resistance. Its most significant disadvantage is having a deficient tensile strength that causes the development and propagation of cracks—these properties of concrete limit its application with tensile stresses. To improve concrete's tensile strength, durability, and mechanical behavior, uniformly distributing fibers throughout its volume is now widespread and referred to as fiber-reinforced concrete. The study examined how the addition of polypropylene fibers influences the pull-out strength of expansion anchor bolts in concrete. An investigation into the influence of fiber content (0%, 0.1%, 0.2%, and 0.3%) on the material's resistance to splitting, compression, and pull-out was conducted. 56 cylindrical samples were tested for split tensile and compression tests, while 24 rectangular samples were tested for the pullout test. The inclusion of polypropylene fiber reinforcement led to significant enhancements in the splitting strength, compressive strength, and pull-out strength of ordinary concrete.

Index Terms

Polypropylene fiber, compressive strength, anchor bolt, pull-out strength

Impact Assessment of Environmental Management System Instrument of ISO 14001:2015 Standard in Construction Firms in Palawan

Kristine Clarisse S. Canilla, *Western Philippines University, Philippines*

Application of ISO 14001-EMS standard in construction firms is used and being studied in different countries. In the Philippines, the province of Palawan, declared as the last frontier, considers environmental protection as its culture where constructions firms are being established through various and vast construction projects. This study aims to develop environmental management system assessment model instrument standard for construction firms in Palawan based on the ISO 14001:2015 – Environmental Management System. The survey questionnaire was constructed by the certified internal audit of ISO 14001:2015 EMS standard and distributed to the population of the construction firms in Palawan. The analysis of data includes descriptive statistical analysis such as mean and frequency. The results revealed that most of the construction firms in Palawan are private owned and did not apply ISO 14001:2015 in their construction firm. Most issues contraries and self-implication of assessment model are it requires more stable worker cost and most of the indicators in their firm has most criterion met but need more improvement. The assessment model instrument of ISO 14001:2015 EMS was further revised and analyzed using the principal component analysis and further its reliability using Cronbach alpha. The assessment model instrument was develop through data reduction using the Principal component analysis. It undergoes evaluation by as ISO certified individual

Index Terms

ISO 14001, Environmental Management System (EMS), Construction Firm, Palawan, Pincipal Component Analysis

iSpeakAI: AI-Driven Development of Pronunciation Learning Bot for Deaf Speech Precision

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Co, Joseph Darwin C., *Pamantasan ng Lungsod ng Maynila, Philippines*

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This study presents iSpeakAI, an AI-driven pronunciation learning bot aimed at improving speech precision among individuals who are deaf or hard of hearing. Recognizing the unique challenges these learners face in acquiring spoken language, iSpeakAI employs advanced machine learning algorithms to assess and analyze speech patterns. The bot offers personalized feedback and adaptive learning paths, enhancing the effectiveness of pronunciation practice. This study involved a diverse group of participants, and results indicated significant gains in both speech clarity and user confidence. The integration of visual and substantial feedback mechanisms ensures an inclusive and engaging learning experience. This presentation will discuss the development process, key findings from user studies, and the potential impact of iSpeakAI on speech therapy practices. By showcasing the capabilities of AI in adapting effective communication, this highlights the transformative role of technology in creating equitable learning opportunities for demote populations. This research points out the importance of innovative educational tools in bridging communication gaps and promoting inclusivity in diverse settings

Index Terms

AI-Driven Development, Deaf Speech Precisio, Pronunciation Learning Botn

Modelling of Machining Ti-6Al-4V Alloys to Investigate Surface Integrity

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Thirein Myo, *Hassan Ghadbeigi, University of Sheffield, UK*

This study concentrated on the modelling of machining Ti-6Al-4V alloy. Ti-6Al-4V alloy is widely utilised in industries like aerospace, automotive, and biomedical because of its exceptional mechanical characteristics, which include a high strength-to-weight ratio, corrosion resistance, and biocompatibility. Ti-6Al-4V alloy is hard to machine due to low thermal conductivity, low modulus of elasticity, and high chemical reactivity. Because of these difficulties, machining Ti-6Al-4V alloy requires an in-depth understanding of the cutting process and the variables that affect results, including surface integrity, chip formation, and subsurface deformation. The present study employed ABAQUS software to conduct in-depth finite element modell (FEM) simulations to address these challenges. This study attempted to understand how chip shape, surface integrity, and subsurface deformation during Ti-6Al-4V machining are affected by friction and cutting speed. To examine their effects on the machining process, the FEM simulations were performed with a range of cutting parameters, such as friction coefficients and cutting speeds. One of the study's findings is that unstable cutting circumstances are linked to the creation of serrated chips, which are caused by increased friction levels at the tool-workpiece interface. Additionally, the study discovered that increased friction leads to increased surface roughness and deeper subsurface plastic deformation, both of which can affect the machined component's fatigue life and overall performance. The study showed that optimising cutting parameters, such as decreasing cutting speed and employing moderate feed rates, can assist preserve better surface quality and reduce subsurface deformation concerning surface integrity. The study also illustrated how plastic strain, stress, and cutting force influenced the surface integrity. Excessive plastic deformation can lead to the development of surface roughness and an increase in material hardness. Residual stress can cause surface cracking, while compressive stress improves fatigue life. The cutting force has an impact on the level of plastic deformation and stress, and higher forces may lead to a reduction in surface quality. The modell simulations were compared to the existing experimental data from the literature review and showed agreement on how different cutting speeds and coefficients of friction affect the surface integrity of the machined components.

Index Terms

ABAQUS, Modelling, Surface Integrity, Ti-6Al-4V Alloy.

Enhancement of Random Forest Applied to Course-Recommendation for Waitlisted Applicants

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This study introduces an Enhanced Random Forest model for a course recommendation system aimed at supporting waitlisted applicants. The study integrates feature engineering, feature selection, and a hybrid hyperparameter tuning approach to improve the model's classification accuracy, reliability, and interpretability. Feature engineering was used to capture interrelationship between program choices and associated college departments, allowing the model to recognize nuance relationships. Recursive Feature Elimination systematically eliminated the least significant features, ensuring that the model focuses on features that have high predictive attributes. To mitigate the limitations of traditional hyperparameter tuning methods, a hybrid approach of RandomizedSearchCV and GridSearchCV was utilized to effectively find optimal parameters while minimizing computation costs. A dataset of 1,505 applicants who underwent the Pamantasan ng Lungsod ng Maynila Admission Test for school year 2024 was utilized to train models. The Enhanced Random Forest was compared against Traditional Random Forest, AdaBoost, Gradient Boosting, and Extra Trees Classifier using an 8-fold cross-validation with different scoring metrics such as accuracy, F1-Score, and ROC-AUC. Results show a significant improvement, where the enhanced model achieved an accuracy of 75.10% with an F1-Score of 74.23% and an ROC-AUC score of 96.57%, outperforming other models across all metrics. The Enhanced Random Forest also achieved a lower standard deviation across all metrics resulting in a stable model compared to the other models. A web application using the enhanced model was developed to support the course recommendation process. The findings demonstrate the effectiveness of the proposed enhancements in addressing challenges in an admission-based recommendation system by offering a robust framework for academic decision-making.

Index Terms

Course Recommendation, Feature Engineering, Feature Selection, GridSearchCV, Hyperparameters, Random Forest, RandomizedSearchCV

Development and Validation of An Aptitude Test in Research Productivity

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The creation and validation of the Aptitude Test for Research Productivity (ATRP), a tool for predicting higher education faculty members' research capacity and productivity, are presented in this paper. ATRP is positioned as a tool to help with the strategic recruitment and development of faculty members who are engaged in research.

Research used a mixed-methods strategy, thorough literature analysis conducted in the first phase to determine the essential competencies linked to high research productivity, refined into quantifiable attributes through expert interviews, modified into a pilot test version that included several psychometric features meant to assess cognitive and non-cognitive abilities relevant to research.

Sample faculty members from three state universities participated in a multi-step process that involved item analysis, reliability testing, and construct validation to validate the ATRP. The study evaluated the validity and reliability of the ATRP using Rasch measurement models and traditional test theory. Ordinal logistic regression used to assess the test's predictive ability and determine how well it could differentiate between various degrees of research productivity.

The validation process's results showed that the ATRP can accurately distinguish between faculty members who are likely to be highly and poorly productive researchers. ATRP items successfully capture fundamental components of research aptitude, evidenced by the test's strong construct validity and internal consistency.

The study suggests using ATRP in conjunction with a comprehensive evaluation plan for hiring and training new faculty members. Subsequent investigations on enhancing the ATRP by the integration of adaptive testing technologies and investigating the effects of cross-disciplinary applications.

Index Terms

Research Productivity, Aptitude Testing, Higher Education, Psychometric Validation, Faculty Development

Enhancing Technical-Vocational Education through Augmented Reality: Evaluating the Usability and Effectiveness of an AR Application for Computer Hardware Assembly Among Senior High School Students in the Philippines

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Thelma Domingo Palaoag, *College of Information and Computer Science, University of the Cordilleras, Baguio City, Philippines*

Technical-vocational education in the Philippines faces significant challenges due to limited access to resources for hands-on training in computer hardware assembly. This lack of practical experience hinders students' skill development, especially in underfunded schools and rural areas. This study evaluates the usability and effectiveness of an Augmented Reality (AR) application designed to simulate computer hardware assembly, aiming to bridge the gap between theoretical knowledge and practical skills. A mixed-methods approach was employed with 41 Grade 11 students from Naguilian National High School in La Union, Philippines. All participants were enrolled in the Technical-Vocational Livelihood track, Information and Communication Technology strand, specializing in Computer Systems Servicing NC-II. Usability was assessed using the System Usability Scale (SUS), while learning outcomes were measured through pre- and post-tests. The Learning Object Evaluation Scale for Students (LOES-S) evaluated instructional design quality and student engagement. The results indicated high usability of the AR application, with an average SUS score of 4.6 out of 5. Students' average scores improved from 7.1 (pre-test) to 8.9 (post-test) out of 10, demonstrating a significant enhancement in learning outcomes. The average LOES-S score was 4.5 out of 5, reflecting strong instructional quality and high student engagement. These findings suggest that the AR application is an effective tool for enhancing learning and engagement in technical-vocational education, particularly in resource-limited settings. By providing practical training without the need for physical equipment, the AR application has the potential to improve technical skills development and promote educational equity in the Philippines.

Forecasting Water Shortages in Agricultural Irrigation in La Trinidad, Benguet Through Predictive Analysis

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The study focused on La Trinidad, Benguet, which is a pillar of highland agriculture in the Philippines, and developed a model in predicting water constraints in agricultural irrigation. Given the region's reliance on a consistent water supply, precise forecasting of water availability can help in mitigating the consequences of possible shortages. Data on drought occurrences and water use from January 2018 to December 2023 were obtained from the La Trinidad Municipal Office and the La Trinidad Water District. The Autoregressive Integrated Moving Average (ARIMA) model was chosen for its ability to handle seasonal changes in time series data. Data preprocessing removed inconsistencies, and cross-validation improved the model's performance in predicting water shortages. Moreover, the study determined the accuracy of the model in forecasting the water shortage. The study's findings provide early warnings to local farmers and officials to facilitate smart resource management. This approach encourages flexible agricultural practices and optimizes irrigation by anticipating water shortages, which aids in the development of water conservation programs. This preventive strategy enhances La Trinidad's agricultural sector, preparing it to withstand future water constraint and contributing to the local food system's sustainability. Finally, the study helps to construct a more adaptable and sustainable agricultural framework for the province.

The Level of Awareness of Education Students at the University of Nizwa Specializing in Science and Information Technology Majors of Digital Ethical Values from their Perspectives

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Dr. Nasser Sulaiyam Nasser Almazidi, *University of Nizwa, Nizwa, Oman*

Dr. Mahmood Zahran Mohammed Al-Waaili, *University of Nizwa, Nizwa, Oman*

The current study aimed to reveal the level of awareness of education students at the University of Nizwa, specializing in Science and Information Technology of digital ethical values from their point of view. The study used the descriptive analytical method. The study sample consisted of 109 female students who included 32 female students from the science major and 77 female students from the information technology major. To answer the study's questions and achieve its objectives, a questionnaire was constructed consisting of three dimensions: respect for usage rules, etiquette for communicating with others, and intellectual property rights. The validity and reliability of the questionnaire were calculated using appropriate statistical methods, where Cronbach's alpha reliability coefficient reached (0.918). The results of the study showed a very high level of awareness of digital ethical values among the participants. The study also showed that there were no statistically significant differences at the level of significance ($\alpha \leq 0.05$) for the level of awareness of the study sample about digital ethical values due to the variable of major in science and information technology. The study recommended that Students should develop their skills in critically evaluating the information they obtain from the internet.

Index Terms

Awareness, Science, Information Technology Digital Ethical Values, Perspectives

Exploring Emerging Technologies' Impact on AIDA and Marketing Mix in Digital Marketing for India

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Dr. Raj Sinha, *Assistant Professor, School of Computer Applications, Lovely Professional University, Punjab, India*

This study aims to evaluate the impact and effectiveness of digital marketing on the audiences of the Indian OTT (over the top) media industry in the year 2024. The Over-the-Top (OTT) services have become like a streaming gadgets technology that gaining piquancy, soothed by growth, internet penetration and mobile usage across India. The questionnaire-based study proceeds to use the AIDA approach strategy (that stands for Attention, Interest, Desire, and Action) in assessing the impacts of marketing on different types of media and that of consumer behavior.

The survey looks at the levels of satisfaction with both the content and its advertising appeal as well as the level of customer care offered. This is applied on AIDA system to structure these answers encoding the role of persuasive advertising as well as the role of emerging trends — the level of interest development and preservation. Also, the study takes into consideration the rapidly changing digital landscape in India, which is encouraging marketers to be more data driven in their selling effort. The study also describes the role of artificial intelligence and machine learning (ML) in providing targeted services.

The research results provide confidence that the application of the AIDA structure to digital marketing communication measures attracts the audience's attention for OTT sector in India. This research offers important considerations for the attention of marketers looking to adapt to the Indian media system which is content-rich but fraught with challenges in personalization and moderation of privacy at the same time.

Index Terms

Over-the-Top (OTT) Media; AIDA (Attention-Interest-Desire-Action) Model; Consumer Behavior; Artificial Intelligence (AI) in Marketing; Marketing Mix; Consumer Behavior

Digital Marketing Evolution and Societal Challenges in India's Software and Allied Industries

Prasenjit Chakrabarty, *Research Scholar, Department of Management, Dr. K.N. Modi University, Newai, Rajasthan, India*

Dr. Raj Sinha, *Assistant Professor, School of Computer Applications, Lovely Professional University, Punjab, India*

The study explores the rapid expansion of digital marketing in India, especially in software and associated industry. The rapid evolution of digital marketing, in India, was accelerated by the rapid internet adaptation, tele-density and systematic 4G, 5G roll out. Through a dual perspective survey of industry, sales- marketing professionals, & OTT (over the top) consumers, we gauged the impact of various channels, underlying factors. These factors included the local language, local customs and cultural differences, and local unique festivities. The data reveals the strong customer inclination towards quality of content, flexibility in payment method, stressing the requirement of regional tailored marketing strategies. This study reveals significant correlations between marketing channels like social media, content, influencer marketing, and demographic segmentation, (location, age gender, income group). These insights are essential for the marketers to estimate the likely success of their campaigns.

Index Terms

Digital Marketing, Digital Media, Marketing, Promotions, Digital Advertising

Offline Augmented Reality for Rural Tourism Development: Empowering Cultural Preservation and Community Sustainability through ID-QUBE and ID-MAP Design

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This paper presents the development and application of two integrated product of an offline augmented reality (AR) systems, namely as ID-QUBE and ID-MAP - to support rural tourism in areas with limited internet connectivity. The ID-QUBE, a portable AR server, and ID-MAP, an interactive digital poster, were designed to provide digital and cultural information to tourists in offline environments. These systems address the infrastructural challenges faced by rural tourism initiatives by utilizing solar-powered, user-friendly interfaces that facilitate real-time AR experiences without the need for internet access. Through an innovative approach combining AR technology with local tourism, this research explores how digital interactivity can enhance the economic potential of rural communities by offering immersive cultural experiences. The paper discusses the system's architecture, its use of marker-based applications for offline data retrieval, and its potential for scalability in similar rural settings. The integration of these technologies' positions ID-QUBE and ID-MAP as pivotal tools for the sustainable development of rural tourism. The study concludes with recommendations for further enhancements and commercialization, highlighting the role of digital innovations in promoting cultural heritage in underserved areas.

Index Terms

Augmented Reality (AR), Offline Systems, Rural Tourism Development, Digital Mapping, Cultural Heritage Preservation

ICAKMPET

Enhancement of Profanity Filtering and Hate Speech Detection Algorithm Applied in Minecraft Chats

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Gorel Kaiser G. Marbella, *Pamantasan ng Lungsod ng Maynila, Philippines*

This study addresses critical limitations in an existing profanity-filtering algorithm: insufficient context interpretation and absence of leetspeak detection. First, the researchers integrated the BERT transformer model to improve context-sensitive filtering, achieving a 99.1% accuracy rate and a 10.4% increase in correctly censoring 1,000 chat results from the Minecraft-Server-Chat dataset. Toxicity scoring with Toxic-BERT allowed precise filtering, distinguishing between friendly and harmful content words. Second, the researchers incorporated a reverse mapping function to identify leetspeak, significantly improving censorship accuracy. In the dataset of 1,000 chats in Minecraft-Server-Chat dataset, 108 leetspeak inputs were analyzed. The Enhanced Algorithm demonstrates an 82.4% censorship success rate for leetspeak-masked inputs, reducing the error rate to 2.8% compared to the Existing Algorithm's 10.2%. It was found that the Enhanced algorithm had a performance improvement of 8.3% over the existing algorithm. These advancements made the Enhanced Algorithm a robust, context-aware and accurate in leetspeaks for moderating Minecraft chats, fostering a safer and more inclusive online environment.

Index Terms

Augmented Reality (AR), Offline Systems, Rural Tourism Development, Digital Mapping, Cultural Heritage Preservation

An Enhancement of the Glicko-2 Algorithm Applied to Matchmaking in Chess Games

Sealtiel P. Fajardo, *Pamantasan ng Lungsod ng Maynila, Philippines*

Rbi Mikko H. Nevado, *Pamantasan ng Lungsod ng Maynila, Philippines*

This study addresses critical limitations in an existing profanity-filtering algorithm: insufficient context interpretation and absence of leetspeak detection. First, the researchers integrated the BERT transformer model to improve context-sensitive filtering, achieving a 99.1% accuracy rate and a 10.4% increase in correctly censoring 1,000 chat results from the Minecraft-Server-Chat dataset. Toxicity scoring with Toxic-BERT allowed precise filtering, distinguishing between friendly and harmful content words. Second, the researchers incorporated a reverse mapping function to identify leetspeak, significantly improving censorship accuracy. In the dataset of 1,000 chats in Minecraft-Server-Chat dataset, 108 leetspeak inputs were analyzed. The Enhanced Algorithm demonstrates an 82.4% censorship success rate for leetspeak-masked inputs, reducing the error rate to 2.8% compared to the Existing Algorithm's 10.2%. It was found that the Enhanced algorithm had a performance improvement of 8.3% over the existing algorithm. These advancements made the Enhanced Algorithm a robust, context-aware and accurate in leetspeaks for moderating Minecraft chats, fostering a safer and more inclusive online environment.

Index Terms

Augmented Reality (AR), Offline Systems, Rural Tourism Development, Digital Mapping, Cultural Heritage Preservation

Enhancement of Discrete Wavelet Transform Algorithm Applied in Medical Image Compression

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Rona Jean B. Castro, *Pamantasan ng Lungsod ng Maynila, Philippines*

The Discrete Wavelet Transform (DWT) is widely used in medical image com-pression for its ability to capture spatial and frequency characteristics. However, DWT's inability to retain phase information—critical for maintaining the alignment of edges and textures in images—can result in distortions and loss of essential details, potentially affecting clinical diagnosis. This paper presents an enhanced DWT algorithm designed to address this limitation by incorporating a trained Autoencoder to learn and preserve essential image features for improved reconstruction. The Autoencoder comprises an encoder with convolutional layers using non-separable filters to enforce orthogonality, and a decoder with trans-posed convolutions for image reconstruction. JPEG2000 was employed as the compression technique, with the proposed method achieving a similar compression ratio to traditional DWT, indicating no compromise in efficiency. Experimental results show that the enhanced DWT with autoencoder significantly out-performs the traditional DWT method, achieving up to 61.90% improvement in Peak Signal-to-Noise Ratio (PSNR), thereby reducing distortions and preserving critical image details more effectively. This improvement is crucial for maintaining the integrity and diagnostic quality of medical images, ensuring that essential features are accurately represented.

Enhanced Support Vector Machine for Spam Email Classification

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Dana Justine D. Pacatang, *Pamantasan ng Lungsod ng Maynila, Philippines*

Support Vector Machines (SVM) have proven to be effective in many classification tasks. However, SVM's performance deteriorates when faced with high-dimensional data due to the curse of dimensionality, where the increasing number of features reduces the model's ability to generalize and increases computational complexity. This study addressed this challenge by using an enhanced SVM model that incorporates a Term Frequency-Inverse Document Frequency - Class Variance (TF-IDF-CV) feature extraction method applied in spam email classification. Unlike traditional methods, TF-IDF-CV considers class variance during feature extraction, which helps mitigate the negative effects of high-dimensional data. Experimental results demonstrate that the enhanced SVM outperforms traditional feature extraction techniques, including TF-IDF, Bag of Words, and Word2Vec, achieving an accuracy of 99.42%, precision of 99.43%, recall of 99.42%, and an F1-score of 99.42%. These findings underscore the enhanced robustness and reliability of the SVM model, positioning it as a promising solution for efficient and accurate spam detection in high-dimensional datasets.

Enhancement of Density Based Spatial Algorithm with Noise for Fire Risk Assessment and Warning in Metro Manila

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Pinky Mae De Leon, *Pamantasan ng Lungsod ng Maynila, Philippines*

This study focuses on applying an enhanced Density-Based Spatial Clustering Algorithm with Noise for fire risk assessments and warning in Metro Manila. Unlike other clustering algorithms, DBSCAN is known for its ability to identify arbitrary shaped clusters and its resistance to noise. However, its performance diminishes when handling high dimensional data, wherein it can read the noise points as relevant data points. Also, the algorithm is dependent on the parameters (eps & minPts) set by the user, choosing the wrong parameters can greatly affect its clustering result. To overcome these challenges, the study proposes three key enhancements, first is to utilize multiple MinHash and Locality-Sensitive Hashing to decrease the dimensionality of the data set, second is to implement Jaccard Similarity before applying the parameter Epsilon to ensure that only similar data points are considered neighbors, and third is to use the concept of Jaccard Neighborhood along with the parameter MinPts to improve in classifying core points and identifying noise in the data set. The results show that the modified DBSCAN algorithm outperformed three other clustering methods, achieving fewer outliers, which facilitated a clearer identification of fire-prone areas, high Silhouette score, indicating well-separated clusters that distinctly identify areas with potential fire hazards and exceptionally achieved a low Davies-Bouldin Index and a high Calinski-Harabasz score, highlighting its ability to form compact and well-defined clusters, making it an effective tool for assessing fire hazard zones. This study is intended for assessing areas in Metro Manila that are most prone to fire risk.

Modified Isolation Forest Algorithm for Credit Card Fraud Detection

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Isolation Forest algorithm is an isolation-based method used for anomaly detection. The algorithm has a problem with swamping which is the misclassification of the normal data points as anomalies. The said problem of Isolation Forest reduces its accuracy and effectiveness. The Modified Isolation Forest used an undersampling method called Near Miss to address the problem of the Isolation Forest regarding swamping. The algorithm results in misclassification if a large imbalance dataset is used. Hence, incorporating Near Miss undersampling method to obtain a balanced dataset helps to reduce swamping. A dataset containing transaction of European cardholders is used in this study, which has 492 fraudulent transactions among 284807 transactions. Both the original algorithm and the modified algorithm are tested for anomaly detection using the same dataset. The original algorithm resulted in 140 True Positive (TP), 235469 True Negative (TN), 48846 False Positive (FP), and 352 False Negative (FN). While, the modified algorithm resulted in 405 TP, 405 TN, 87 FP, and 87 FN. The modified Isolation Forest algorithm results in a significantly better performance compared to the original algorithm. With an accuracy rate, precision, recall and f1-score of 0.82317 or 82.317%, the Modified Isolation Forest algorithm addressed the issue of swamping.

An Analysis of Time-Series Forecasting Models for Optimizing School-Based Feeding Programs

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Accurately forecasting meal demand in School-Based Feeding Programs (SBFPs) is essential for enhancing program efficiency and minimizing food waste. This study assessed the performance of four predictive models—ARIMA, Long Short-Term Memory (LSTM), Prophet, and Random Forest Regression—in forecasting daily attendance for SBFPs. Attendance data from ten schools within the Tarlac City Schools Division, spanning August 19 to October 19, 2024, were used. The LSTM model demonstrated superior predictive accuracy, achieving the lowest RMSE (5.51), MAE (4.91), and sMAPE (0.27%), making it the most effective model. Prophet followed closely with an RMSE of 5.89, MAE of 4.96, and sMAPE of 0.27%. Random Forest Regression showed moderate performance with an RMSE of 6.56 and MAE of 5.19, while ARIMA underperformed significantly with an RMSE of 435.60 and MAE of 392.43. These findings highlight the potential of AI-driven forecasting models like LSTM to optimize resource allocation, reduce food waste, and improve the operational efficiency of SBFPs.

Index Terms

School-Based Feeding Program, Forecasting, Lstm, Arima, Prophet

Analysis of Bandwidth Management Algorithms

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The internet is one of the most important technological advancements in our era, and it is difficult to imagine what our lives would be like without the internet. The National ICT Household Survey of 2019 conducted by the DICT, only 29% out of 2,617 Barangays have installed Fiber Optic Cable (FOC). Furthermore, 60% have 4G connectivity and only 12% have free wifi. To maximize the utilization of the internet and local area bandwidth of the Local Government Unit (LGUs), this study aims to analyze the different bandwidth management algorithms to mitigate bufferbloat, which is one of the primary causes of slow internet. The method will follow the Network Development Life Cycle (NDLC) and a simulated network environment & the network analysis tool, WaveForm, will be used to evaluate the metrics based on QoS standards TIPHON which are: throughput, latency & jitter. A grading system will also be utilized based on WaveForm's Bufferbloat Test. After analyzing the results, the data gathered shows evidence of having a significant difference in network quality between before and after the bandwidth management algorithms were implemented. The best overall algorithm, layer_cake, was graded A six (6) times, and A+ four (4) times. The algorithm is categorized as either excellent or good under all parameters and is the only one out of six (6) configurations that has upload quality that is almost equal with the download quality. In conclusion, this showed that proper use of bandwidth management algorithms significantly increases internet performance. The research was able to achieve its objective of evaluating the throughput, latency, and jitter after the implementation. It has successfully shown that there is a significant difference between before and after it was implemented: the results after implementation have consistency and overall better results.

Index Terms

Bandwidth Management Algorithms, Bufferbloat, Tiphon, Waveform, QOS

Understanding Consumer Sentiment and Trends in Product Reviews Using Topic Modeling

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Integration of topic modelling and sentiment analysis plays a significant role to uncover underlying themes and emotional tones in large text datasets, enhancing our understanding of complex narratives. This study employs topic modeling and sentiment analysis to analyze consumer reviews across various product categories, aiming to uncover underlying themes in consumer sentiment and preferences. Utilizing a dataset that contains over 5000 of online reviews, we preprocess the text using natural language processing techniques. Latent Dirichlet Allocation (LDA) is applied to identify ten distinct topics, each reflecting key consumer interests. In addition to topic modeling, we conduct sentiment analysis using TextBlob to calculate sentiment scores for each review, categorizing them as positive, negative, or neutral. This analysis reveals consumer attitudes towards the identified themes, such as the positive reception of "Sleep Aids" and a growing preference for "Organic Baby Formula." The results suggest that brands can leverage these insights to tailor their marketing strategies, innovate product offerings, and enhance consumer engagement. This research contributes to the understanding of consumer behavior in a dynamic market landscape, providing actionable insights for brands seeking to align their products with consumer needs and preferences. Future studies could further explore the implications of these findings on purchasing decisions and brand loyalty. Ultimately, this study contributes to the growing body of knowledge on customer sentiment analysis and its implications for e-commerce strategies.

Index Terms

Topic Modelling, Sentiment Analysis, Consumer Reviews, E-commerce, Latent Dirichlet Allocation (LDA)

The Effect of Cutting Parameters on Hole Quality in Aluminum Alloy Al5083

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Aluminum alloys are the most usable material in industrial markets such as aerospace, marine, and automotive due to their excellent performance in resisting fatigue and corrosion. As the demand for aluminum alloys increases, these materials are growing in the global market due to their low cost, machinability, and mechanical properties. However, once it comes to the machining and particularly the drilling process, the quality of the drilled hole should be considerable to investigate the effect of cutting parameters, namely spindle speed and feed rate, on the inner surface of these holes, where they play a crucial role in many industrial areas. For instance, an aircraft's wing requires namouras holes to be attached to the main structure by using rivets and bolts. This investigation might be beneficial for the manufacturers to save time and money with optimal hole quality. The current research study examines the effect of cutting parameters (feed rates and spindle speed) on hole quality in aluminum alloy Al5083 by using HSS drill bits. A CNC machine was utilized for the drilling process, where 48 holes were drilled without using any coolant and 48 holes under flooded cutting fluid. The experimental results revealed that both Ra and Rz increased by increasing the spindle speed and feed rate. However, the drilled holes with coolant have minimum Ra and Rz. In general, the holes were oversized at the entry and reduced at the exit, and by increasing the feed rate, the hole size declined. Moreover, an acrylic backup support is used to reduce the burr formation at the hole's exit. The results were supported by using the full factorial method and ANOVA (analysis of variance) to evaluate each input parameter's contribution to the hole's quality.

Enhancement of Q-Learning Algorithm for Personalizing Adaptive Learning Strategies

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This study aims to enhance the Q-learning algorithm for personalizing adaptive learning strategies. However, it addresses two critical challenges: overfitting to static datasets and overestimation bias. Static datasets constrain the algorithm's ability to generalize unseen states, resulting in suboptimal decision-making. Overestimation bias inflates the Q-values of certain actions, leading to unreliable and overly confident strategies. Integrating Prioritized Experience Replay (PER) into the Q-learning framework. PER prioritizes transitions with high temporal-difference errors, enabling the algorithm to focus on learning experiences that maximize policy improvement. The enhanced algorithm was evaluated in a simulated learning environment with probabilistic state transitions to mimic realistic scenarios. It achieved a faster convergence of Q-values with a 20% reduction in the number of episodes required for stabilization, reaching steady Q-values in fewer than 800 episodes. Action selection diversity significantly improved, with the most dominant action accounting for only 50% of decisions. By addressing key limitations in static datasets, this study contributes to advancing reinforcement learning research and offers practical insights for applications in education, healthcare, and other structured decision-making domains.

Modified Iterative Dichotomiser 3 (ID3) Algorithm Applied in Diabetes Risk Detection

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This study presents a modified ID3 decision tree algorithm aimed at mitigating multi-value bias, which can compromise classification accuracy. The algorithm employs a mutual information-based weighted gain for attribute selection, reducing the preference for attributes with numerous distinct values while ensuring strong accuracy levels. Tested on a diabetes dataset with 520 instances and 16 categorical features, the model was evaluated using standard performance metrics including accuracy, precision, recall, and F1 score, then compared to the traditional ID3 and other modified versions. For a 50% test size, the modified algorithm achieved 94.59% accuracy, surpassing the traditional ID3's 93.39%. With a 40% split, results were 95.56% compared to 93.16%. At 30%, it scored 96.04%, ahead of 93.18% from ID3. For 20% and 10% splits, the modified algorithm obtained accuracies of 96.39% and 96.82%, outperforming ID3's 94.20% and 94.09%, respectively. These findings reveal an average accuracy improvement of approximately 1.2% to 2.9% across training holdouts of 50% to 90%. The modified algorithm consistently outperforms traditional ID3, enhancing classification performance and yielding more accurate and reliable decision trees.

Index Terms

Attribute Selection, ID3, Multi-Value Bias, Mutual Information

Deriving the Current Sentiments and Issues being encountered by Work-from-Home (WFH) Employees in the Philippines

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The influx of job seekers who have applied for work-from-home (WFH) jobs after the pandemic has shifted the expectations and needs of employees involved with online and freelance work. To better understand the shift within the industry, this study aimed to determine the current sentiments and issues being encountered by people involved in the post-pandemic WFH market with the use of Natural Language Processing (NLP) tools. A total of 11,868 posts and comments were collected from the social media platform Reddit for analysis. Sentiment analysis was first conducted using the NLTK VADER model. It was found that the overall sentiment of users towards WFH jobs was slightly positive, with a compounded score of 0.1905, showing that many employees still feel that the benefits of WFH jobs still outweigh the issues that they have been encountering in recent years. Topic modeling was then conducted using a Latent Dirichlet Allocation (LDA) model and it was found that the biggest concerns users had towards WFH jobs were "salary and compensation", "time management", "company policies and culture", "job stability", and "skills management". These issues highlight the need for better policies and government regulations towards WFH jobs, to ensure employees who do remote jobs will be protected by the same laws and regulations as traditional employees. The findings also highlight the need for better platforms for WFH employees to engage in personal and professional development, so that they can keep up with the ever-growing needs and requirements of remote jobs.

From Ecosystem to Institution: The Role of Crowdfunding and Social Networks in Shaping Sustainable Entrepreneurship

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This study investigates the influence of the sustainable entrepreneurship ecosystem on social networks and their subsequent role in institutional emergence. Leveraging technological advancements and social networks, the research also explores the mechanisms through which crowdfunding fosters institutional diversity. A quantitative approach was employed, analyzing data from 256 participants, including angel investors, venture capitalists, regulators, and educationists involved in entrepreneurial promotion. Using the PLS-SEM method and convenience sampling, the findings reveal that the sustainable entrepreneurship ecosystem significantly enhances institutional emergence, particularly institutions funded through crowdfunding. Moreover, technological advancements and robust social networks positively mediate this relationship.

The results emphasize the need for organizations to integrate social media analytics and technological tools to deepen their understanding of the demand for new institutions. Entrepreneurs and innovators must examine how technological advancements impact markets, regulatory frameworks, and environmental dynamics. Policymakers and community leaders are urged to foster social networking spaces as strategic components to support entrepreneurial ecosystems. The dynamic interplay between technological progress and social networks drives the creation of new entities with specialized objectives, reinforcing the ecosystem's capacity for growth.

This study contributes to the literature by unveiling the nuanced role of social networks and technological innovation in institutional formation. The findings provide actionable insights for stakeholders aiming to optimize entrepreneurial ecosystems and promote institutional diversity, emphasizing the critical role of supportive networks and technological tools in adapting to evolving environments.

Adapting to Climate Change: Food Security and Agricultural Food Innovation Interventions

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Climate change poses major threats to human security, food shortages, and displacement. Extreme weather events and the spread of climate-related pests and diseases significantly impact the farmer's food security. This study examined the influence of sustainable food security and agricultural food innovation on climate change adaptation through hard copy and Google forms surveys as data gathering tools after undertaking arduous systematic testing to ensure the correctness and reliability of the instrument. Descriptive correlational and causal research designs were used in the study. A sample was drawn from 112 Learning Sites for Agriculture (LSA) owners in Northern Mindanao using a proportionate stratified random sampling. Farmers demonstrate a high-level understanding of enhancing food security and agricultural food innovation. This implies that adapting the prevailing climate change would lead to enhanced food security and agricultural food innovation. Moreover, variables that best predict the effect of climate change are food availability in food security and improving food processing and preservation techniques in food innovation. These variables play a role as a significant predictor of climate change. Finally, proposed intervention programs are developed to help the farmers navigate their farm-market activities to improve their economic condition.

Index Terms

Adaptation, Climate Change, Food Security, Innovation, Intervention Program

Qualitative Analysis of AI Experts' Interpretation of Gender Differences in Smoking Among Individuals with Disabilities

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This study investigates how AI experts interpret research findings on gender differences in smoking behaviors among individuals with disabilities, focusing on the challenges and nuances of their qualitative perspectives. The researcher presented participants with a machine learning (ML) analysis highlighting these gender differences and asked for their interpretations. Five professionals, including AI developers and sales executives of AI-related products, participated in in-depth interviews. Qualitative analysis revealed that four participants perceived the findings as consistent with general trends, while one participant critically questioned the validity of the observed patterns, suggesting they may not accurately reflect typical behaviors. These findings illustrate the diverse ways AI experts contextualize ML-generated research outcomes and emphasize the need to incorporate specialized knowledge and consider contextual factors when interpreting results related to sensitive populations.

Index Terms

Adaptation, Climate Change, Food Security, Innovation, Intervention Program

Maternal Perception of Developmental Delays in Young Children

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This study investigates the types of problems related to the risk of developmental delays that are most frequently reported by mothers of young children. A big data analysis was conducted on 1,700 posts from parenting forums between 2010 and 2024 using search terms including developmental delays, developmental disorders, ADHD, borderline intellectual functioning, and slow learners. The dataset focused on children under the age of seven. Data were preprocessed by removing extraneous and overlapped words, and text mining techniques were employed to analyze the central tendency of keyword, concerning on the top 50 keywords. Data collection and processing were carried out using the Naver API and Python 3.8. The analysis identified key terms such as language, inability to perform tasks independently, gross and fine motor delays, and so on. The findings suggest that mothers commonly observe language difficulties, challenges in performing tasks independently, attention problems and difficulties in initiation of school tasks. This study underscores the importance of prioritizing language-related concerns when addressing developmental delays in young children.

Exploring Machine Learning Models for Predictive Analytics in Solar Power Generation

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Solar power generation is a critical metric for energy management, grid stability, and renewable energy optimization. Predictive analytics offers promising solutions to improve generation efficiency through machine learning models that analyze environmental and generation data. This study focuses on developing machine learning algorithms to predict solar power generation accurately, addressing challenges like data variability, temporal alignment, and feature selection that influence energy forecasting and system reliability.

The research employs supervised machine learning algorithms, including linear regression, random forests, and gradient boosting. Weather sensor data and generation records are preprocessed to align time-series data and identify key features influencing power output, which are then used to train and test the models. Evaluation metrics for the models include mean squared error (MSE), accuracy, and interpretability.

Preliminary findings indicate that machine learning models, particularly Random Forests and Gradient Boosting, can effectively predict solar power generation with moderate to high accuracy, improving renewable energy management by optimizing grid stability. Random Forests emerged as the most reliable model, capturing non-linear relationships between variables such as ambient temperature and daily yield, while Gradient Boosting provided competitive performance but required more complex parameter tuning. Linear Regression, though less effective, highlighted opportunities for refining feature selection.

The study emphasizes the importance of addressing data quality and variability through rigorous preprocessing and model validation. Findings underscore the predictive value of ambient temperature and daily yield in determining energy output, guiding strategies for efficient plant operation. By showcasing the integration of machine learning in renewable energy, this research highlights its potential to enhance solar power efficiency, optimize resource use, and contribute to more sustainable and resilient energy systems.

Organizational Commitment, Employee Retention, Job Satisfaction, and Performance among Private School Teachers: A Structural Model

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Teachers play an essential part in molding and imparting knowledge to the young minds of the students. The more teachers feel valued in their school, the more productive they are. Retaining and satisfying dedicated teachers becomes important. This study developed a structural model of teachers' commitment, retention, and satisfaction with performance. Four hundred twenty-two (422) secondary private school teachers participated in the study. Descriptive correlational and causal-comparative research designs were employed. Valid and reliable survey questionnaires were used as data collection tools. Structural Equation Model (SEM) was developed using AMOS. Results revealed that secondary private school teachers have a high level of commitment. Teachers are highly satisfied with advancement, recognition, working conditions, and interpersonal relationships. Teachers are just moderately satisfied with their salaries. There is a significant relationship between performance and organizational commitment, employee retention, and job satisfaction, and is also positive. The best predictors of teachers' performance are affective commitment, interpersonal relationships, working conditions, advancement and normative commitment, and intent to stay. All these predictors have a positive and direct impact on teachers' performance. The best model fit that explains teachers' job performance is Structural Model 5, anchored on organizational commitment, employee retention, and job satisfaction.

Index Terms

Affective Commitment, Perceived Organizational Support, Interpersonal Relationships, Intent To Stay, Productivity, Structural Equation Modeling

Entrepreneurship Education Influencing Entrepreneurial Intentions of Business Students

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Entrepreneurship education plays a crucial role in equipping students with the skills and confidence to pursue entrepreneurial opportunities, fostering their intentions to engage in entrepreneurial activities. This study explores the influence of entrepreneurship education on the entrepreneurial intentions of business students in Cebu City, Philippines, focusing on perceived desirability, perceived feasibility, and propensity to act. It highlights how education shapes students' entrepreneurial aspirations while addressing the barriers they face.

A quantitative research design was employed, using Structural Equation Modeling (SEM) to analyze data from 300 business students across three universities: the University of San Carlos, the University of San Jose-Recoletos, and Cebu Technological University. Data were gathered through a structured questionnaire covering demographics, key constructs, and perceived obstacles. The analysis provided insights into the direct and indirect effects of entrepreneurship education on entrepreneurial intentions.

The findings indicate that entrepreneurship education significantly enhances students' perceptions of entrepreneurship as desirable and strengthens their willingness to take entrepreneurial action. These factors, in turn, positively influence entrepreneurial intentions. While perceived feasibility is moderately influenced by education, it does not directly contribute to entrepreneurial intentions in this context. Major barriers identified include lack of capital, fear of failure, and market competition.

This study emphasizes the importance of experiential learning approaches, such as mentorship programs and business simulations, in making entrepreneurship education more effective. By addressing perceived challenges and fostering proactive attitudes, educational institutions can better prepare students for entrepreneurial success. The findings provide actionable insights for designing educational programs that inspire and support aspiring entrepreneurs.

Index Terms

Entrepreneurship Education, Entrepreneurial Intentions, Perceived Desirability, Perceived Feasibility, Propensity to Act, Business Students, Structural Equation Modeling (SEM)

Enhanced You Only Look Once (YOLOv5) Object Detection Algorithm for Traffic Flow Management

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This study enhances the YOLOv5 object detection algorithm for real-time traffic flow management at intersections. The original YOLOv5 faced limitations in distinguishing parked from moving vehicles, classifying vehicles in cluttered backgrounds, and detecting under poor visibility. To address these, semantic segmentation identified moving vehicles, a modified convolutional block attention module (CBAM) improved classification amidst clutter, and data augmentation addressed rain and night-time challenges. Experimental results showed significant improvements. For parked versus moving vehicle detection, the enhanced algorithm achieved an mAP of 80.7%, Precision of 79.4%, and Recall of 84.2%, outperforming the original's 72.3%, 70.8%, and 77.9%. For cluttered environments, mAP increased to 81.9% from 70.1%, with Precision and Recall rising to 80.3% and 83.7%. Under adverse conditions, mAP improved to 78.5%, with Recall reaching 79.8%, compared to the original's 65.2% and 62.3%. Inference time decreased from 23.6ms to 20.3ms, boosting the frame rate from 42.4 FPS to 49.2 FPS, ensuring real-time responsiveness. These advancements establish the enhanced YOLOv5 as a reliable tool for intelligent traffic light systems, optimizing intersection flow and improving safety in diverse traffic scenarios

Index Terms

Entrepreneurship Education, Entrepreneurial Intentions, Perceived Desirability, Perceived Feasibility, Propensity to Act, Business Students, Structural Equation Modeling (SEM)

An Enhancement of The Jaro-Winkler Fuzzy Searching Algorithm Applied in Library Search Engine

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The Jaro-Winkler algorithm is widely used for approximate string matching, offering reliable similarity calculations between two strings. However, its performance declines with increasing string length due to bias against longer strings and its reliance on prefix similarity, which neglects significant suffix matches. This paper presents an Enhanced Jaro-Winkler algorithm that addresses these challenges by integrating a Rabin-Karp Rolling Hash – inspired technique and applying suffix weights to balance the prefix bias. Experimental evaluations using 100 words commonly found in book titles demonstrate the enhanced algorithm's robustness across varying fuzzy match thresholds (0.7, 0.8, and 0.9). Unlike the traditional algorithm, where higher thresholds reduce match accuracy, the enhanced algorithm consistently achieves 100% accuracy in identifying titles regardless of query position or threshold. Additionally, it showcases superior performance by improving the quality and quantity of retrieved results by a significant number of titles compared to the traditional approach. These advancements highlight the algorithm's potential for improving search performance in applications requiring precise and flexible string matching.

The Interplay Between the Precautionary Principle and Environmental Sustainability in Indian Jurisprudence

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The precautionary principle is a essential instrument for endorsing sustainable development in India, and it plays a vital part in the nation's conservational governance to augment well-being and ecological decision-making. The application of this principle is multifaceted and open to analysis. Several matters from the Apex Court and the NGT (National Green Tribunal) demonstrate how methodical certainty or uncertainty, along with consistent legal ethics of proof, can assist as the origin for legal decisions, predominantly in the framework (Alan Randall 2011) of the precautionary principle.

Illustrating from Charles Weiss's notional understandings, an ecological context can be shaped to address scientific uncertainty by establishing a hierarchy of legal standards with increasing levels of certainty, familiar to both lawyers and the judiciary. Pursuing sustainable development goals requires evidence-based policies and decisions grounded in scientific knowledge, supported by environmental governance and the rule of law. The article advocates that India ought to progress a agenda of procedures to deliver a vibrant roadmap for authorities to appeal towards the precautionary principle.

Index Terms

Sustainable Development, Precautionary Principle, Environmental Governance, Environmental Degradation, Human Health

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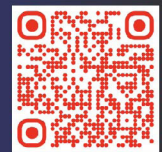
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Dr. Jordan Llego, RN, LPT, MSN, MEd-EL, PhD, D. Hon. Ex., PhDN
Dean
College of Nursing and Midwifery
University of Luzon Dagupan City, Philippines

Ms. Abhilasha Tiwari
Clinical Tutor
Rajendra Institute of Medical Sciences
Ex Nursing Officer, All India Institute of Medical Sciences
Raipur, India

Keynote Speaker

Dr. THERESA MENDOZA MOSTASISA, RN, BSN, MS, PHN, DSD, EdD
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An Enhancement of Item-Based Collaborative Filtering Algorithm Applied in Book Recommendations

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This study focuses on enhancing the Item-Based Collaborative Filtering Algorithm in book recommendation systems to improve similarity calculation. The algorithm recommends items similar to previous items the user had interacted with. The study addressed the algorithm's failure to consider the weight of the interaction date and the interaction progress in the calculation. An item interaction monitoring progress and time-based weight – depending on the interaction's aging days, were applied to the implicit interaction data. Those completed and most recent item interactions were identified as the basis for recommending similar items. Testing sequences of 10 users to 20 items, with random interactions, progress, and date, showed the enhanced algorithm outperformed the original algorithm. The average interaction data was reduced by 42.89% (0.217 ± 0.050 vs. 0.380 ± 0.067), indicating consideration of interaction date and progress, which resulted in a 29.92% decrease in the average similarity score (0.180 ± 0.017 vs. 0.257 ± 0.017). These results demonstrate that the enhanced algorithm's improved interaction data considered the varying weights of the interaction date and the interaction progress, leading to more confident and accurate similarity calculation. The findings suggest the enhanced approach provides a more reliable assessment of item interaction, enabling better item recommendations

Index Terms

Book Recommendation, Enhancement, Interaction Date, Interaction Progress, Item-Based Collaborative Filtering Algorithm, Time-Based Weight

The Efficacy of Virtual Interviewing Techniques: A Demographic Viewpoint

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I n today's interconnected world, virtual interviews have become increasingly popular for job interviews and other professional interactions remotely. With advancements in technology and the widespread availability of video conferencing tools, virtual interviews offer convenience, cost-effectiveness, and accessibility to employers and candidates. This empirical paper aims to explore the concept of virtual interviews, their uses, and the challenges of demographic perspectives.

Index Terms

Virtual Interviews, Covid-19, Remote Hiring

Central Tropical Indian Ocean Heat Budget Analysis during Indian Ocean Tripole Events

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T he Indian Ocean Tripole (IOT) mode, associated with the third mode of sea surface temperature anomaly (SSTA) variability, exhibits a unique pattern characterized by positive SSTA dominating the central Tropical Indian Ocean (TIO), while negative SSTA prevail in the western and eastern regions. This distinct mode of variability significantly influences the surrounding climate. In this study, the underlying causes of SSTA variability in the central TIO during tripole events are investigated through an SST heat budget analysis. Specifically, the anomalous warming in the central TIO is examined. A multiple linear regression analysis is performed using climate indices linked to most dominant SSTA-based climate modes, El Nino Southern Oscillations (ENSO), Indian Ocean Dipole (IOD), and IOT on SST budget terms to determine key drivers. The results reveal that net heat flux is the primary contributor to the positive SSTA in the central TIO. To further disentangle this influence, the individual contributions of radiative and turbulent heat flux components are analysed. This study enhances our understanding of TIO dynamics during IOT events and their broader implications for regional and global climate systems.

Index Terms

Tropical Indian Ocean, Indian Ocean Tripole, Sea Surface Temperature, Heat budget analysis, Multiple Linear Regression

Mature Coconut Fruit Detection and Monitoring System Using Computer Vision with A Web Dashboard Visualization Platform

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The coconut tree, often referred to as the "Tree of Life", is one of the most valuable trees globally, providing essential resources for human needs. Traditionally, harvesting is a labor-intensive process posing risks including severe injury and fatal accidents, causing a steady decline in the population of skilled climbers, and in response, recent research has explored the development of robotic harvesters, some of which incorporate computer vision systems for the automated detection of coconut fruits. Another challenge is the coconut maturity classification, which requires substantial expertise, time, and effort. Existing studies have lately employed CNN architectures for coconut fruit maturity detection, demonstrating high accuracy in classification. However, these studies focus solely on detection without the integration with functional hardware for practical harvesting applications. Moreover, current research lacks a comprehensive approach that includes the real-time display and monitoring of detected data, such as the maturity status of coconut fruits, via a web-based dashboard, underscoring the need for integration with harvesting technologies and provide a usable interface for data visualization and decision-making. This study presents a computer-vision-based detection and monitoring system designed for detecting and monitoring coconut fruits by maturity, with a focus on mature fruits wherein YOLOv8 model training achieved an mAP50 of 98.9%, mAP50-95 of 81.6%, 96.3% precision, and 97% recall on 3,752 image datasets. Additionally, a web-based dashboard is integrated to provide visualization and monitoring of detected coconut fruits along with a notification system notifying every detected mature coconut fruit to efficiently track fruit maturity through the integrated system.

The Application of Machine Learning Techniques for Corn Yield Prediction and Management: A Systematic Literature Review

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This systematic literature review examines the application of machine learning techniques for corn yield prediction and management. Fifty primary studies published between 2015 and 2024 were analyzed to synthesize the current state of research in this domain. The review focuses on the machine learning algorithms, input features and data sources leveraged, prediction accuracy achieved, and key challenges identified. The findings indicate that ensemble methods like Random Forest and XGBoost and deep learning approaches like Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks are the most commonly used and practical algorithms. The most critical input features are remote sensing data, weather variables, and soil properties. While machine learning models demonstrate strong predictive performance, challenges remain around data quality, interpretability, and generalizability across diverse growing conditions. This review provides a comprehensive overview to guide future research and practical machine-learning applications for corn yield forecasting.

From Anxiety to Confidence: Strategies to Overcome Speaking Anxiety among ESL Learners in Online Oral Presentations

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Speaking anxiety is a persistent problem among English as a Second Language (ESL) learners, often impairing effective communication during oral presentations. While extensive research has examined language anxiety, there remains a critical gap in understanding how anxiety manifests itself in both verbal and non-verbal communication, particularly in the context of online presentations. This gap is further compounded by the limited understanding of the underlying strategies employed by ESL learners to mitigate anxiety during online presentations. This study employs a qualitative methodology that includes in-depth interviews with ten ESL learners and three expert educators. Thematic coding of the interview data was conducted using Atlas Ti 22 to capture perspectives on the coping mechanisms. Findings of the interviews highlighted that ESL learners employed seven strategies to cope with anxiety, which were categorised into one internal and six external approaches, indicating a preference for externally oriented coping mechanisms. This study provides new theoretical and practical insights into the complex dynamics of speaking anxiety in online presentations and offers valuable guidance to educators and policymakers in developing interventions tailored to the specific needs of ESL learners in Malaysia. By enhancing our understanding of anxiety triggers and effective strategies, this study aims to support the development of targeted pedagogical practices that promote greater confidence and communication efficacy among ESL learners.

Cybersecurity Strategy for Higher Education Institutions: Exploring Standards and Frameworks for Effective Protection

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Higher education institutions (HEIs) are increasingly vulnerable to cybersecurity attacks. As HEIs shift their operations online, they inevitably employ open systems and decentralized processing, making them particularly susceptible to cyberattacks. The study aims to identify the cybersecurity frameworks that HEIs currently employ as well as the characteristics that these frameworks must have. HEIs' cybersecurity frameworks were evaluated using a mixed-methods approach. Initially, a comprehensive review of existing literature was conducted to identify current cybersecurity practices and frameworks used by HEIs. This was followed by expert interviews and case analyses with IT and cybersecurity professionals across a range of HEIs to gather insights into the attributes of effective cybersecurity frameworks. Qualitative data is analyzed through thematic coding to identify common attributes and challenges. Finally, a proposed cybersecurity framework is developed by integrating these identified attributes with established cybersecurity concepts and best practices. The proposed framework is then validated through expert feedback and comparative analysis with existing frameworks to ensure its relevance and effectiveness. The proposed cybersecurity framework, developed from the identified attributes and established concepts, offers a comprehensive approach tailored to the specific needs of HEIs. By incorporating insights from industry professionals and aligning with best practices, the framework provides a robust tool for enhancing the cybersecurity posture of HEIs. This research contributes to the ongoing development of effective cybersecurity strategies in the higher education sector and underscores the importance of a tailored approach to addressing the evolving cyber threat landscape.

Enhancing Reading Comprehension: A Comparative Analysis of Storytelling Videos and Picture Books

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This study explores the effectiveness of two instructional materials—Storyline Online storytelling videos and picture books—in enhancing the reading comprehension of second-year Bachelor of Secondary Education students majoring in English at the Polytechnic University of the Philippines, Santa Maria Bulacan Campus. Using a quantitative research design, pre-tests and post-tests were administered to assess changes in students' comprehension skills.

The study involved 80 participants divided into two groups. Pre-test results showed both groups had low baseline reading comprehension levels. Post-intervention analysis revealed that storytelling videos produced a higher mean improvement (0.73 points, Cohen's d = 0.199) compared to picture books (0.25 points, Cohen's d = 0.062). Storytelling videos demonstrated greater effectiveness, attributed to their multisensory engagement and audiovisual features, which aligned with multimedia learning theories.

While picture books showed limited improvement, they remain valuable for fostering critical thinking and imagination, making them a complementary tool for long-term interventions. The findings suggest that storytelling videos are more effective for immediate comprehension gains, while picture books can support deeper cognitive engagement.

This study highlights the potential of interactive multimedia tools in addressing diverse learning needs and provides insights for educators seeking to enhance literacy instruction. The results advocate for integrating these materials into teaching strategies to optimize students' reading comprehension outcomes.

Designing a Performance Metrics Evaluation Framework for NLP-Driven Chatbots in Local Government Unit

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The integration of Natural Language Processing (NLP) in AI-driven chatbots offers a transformative solution to enhance service delivery and citizen engagement within the Local Government Units (LGUs). The primary goal of this study is to identify and evaluate relevant performance metrics for NLP-driven chatbot and proposes a comprehensive performance metrics evaluation framework tailored to LGUs. A systematic review of relevant academic literature was conducted to identify key performance aspects which were then organized into multi-perspective framework. The proposed framework includes five perspectives: User Experience, Information Retrieval, Linguistic Quality, Technology Efficiency, and Public Service. These perspectives address critical aspects of chatbot performance, including task completion rates and response accuracy to linguistic coherence and public trust. The multi-perspective approach of the framework specifically addresses LGU challenges by incorporating bilingual support and inclusivity that ensures alignment with the unique needs of diverse citizens. Future work includes pilot testing with LGU-specific datasets to empirically validate the framework, refine its metrics and enhance its practical applicability.

Blockchain-Enabled and Encrypted Health Record Portability for Secure Insurance Data Transfers

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Digitization of health care data has resulted in increased concerns about the security and privacy of health care data and efficiency in managing and transferring sensitive medical information. Centralized systems are vulnerable to hacking, fraud, and unauthorized access and therefore are not suitable for large-scale health care data. Currently, methods of encryption like RSA and DSA are highly secure but are inefficient in terms of processing time and thus cannot ensure real-time access to data. To address these problems, this work proposes a hybrid system of blockchain technology coupled with AES-256 encryption for managing electronic health care records robustly, at scale, and securely. The aim is to increase the confidentiality, integrity, and accessibility of health care data while being compliant with the HIPAA and GDPR policies. This approach is new as it combines AES-256 encryption with blockchain technology, a decentralized and unchangeable ledger, meaning data stored is tamper-proof and encryption/decryption can be done at fairly high speeds. The system uses SHA-256 hashing for integrity and permits a high transaction throughput with minimal decrease in performance. The method works through encrypting data using AES-256, storing it on a blockchain to ensure immutability, and providing secure access with low latency through smart contracts. Results from implementation indicate that the system could support up to 50 transactions per second for 1,000 records while encrypting within 0.025 seconds and decrypting within 0.010 seconds per record, which is much more efficient than traditional methods. This system proposed is scalable, efficient, and secure for the management of health care data. It opens avenues for increased privacy and real-time access in both small and large-scale environments.

Index Terms

AES-256, Blockchain, Data Integrity, Healthcare Data, Smart Contracts

Windows-Based Activity Monitoring System for Productivity and Anomaly Detection in WFA Environments

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The emergence of flexible work environments, particularly the "work from anywhere" (WFA) model, has reshaped how organizations manage and assess employee productivity. With employees operating from diverse locations, maintaining consistent performance standards while respecting privacy has become a critical challenge. This study aims to address these challenges by designing and implementing an activity monitoring system specifically for the Windows operating system. The system is intended to assist organizations in effectively tracking employee activities, analyzing performance, and ensuring productivity in remote work setups.

The monitoring system collects and analyzes data on application usage, time management, and other key metrics related to user activity. Additionally, it incorporates anomaly detection algorithms to identify irregular behavior, such as deviations from established activity patterns, which may signal productivity drops or policy violations. Real-time reporting and notifications ensure that managers are promptly informed of relevant insights, enabling proactive decision-making.

The system's effectiveness was evaluated using an experimental approach that involved simulating user data across varying workload conditions. The results indicate that the system performs reliably, maintaining stable response times and high anomaly detection accuracy under low to moderate workloads. Even under high workload scenarios, the system demonstrated robustness, with only a minor impact on performance.

Overall, this activity monitoring system enhances organizational oversight, streamlines performance evaluation, and supports informed decision-making for managing remote employees. By addressing both productivity and privacy concerns, this research contributes a practical solution for navigating the complexities of flexible work environments.

Index Terms

Activity Monitoring, Work From Anywhere, Deviation Detection, Windows OS, Productivity Analysis

Mapping The Future: A Bibliometric Analysis of Organizational Commitment and Corporate Sustainability Trends

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Currently, an organization's commitment to corporate sustainability is needed. Therefore, companies need to pay attention to these two factors. This study aims to analyze and explain research trends from organizational commitment and corporate sustainability to raise awareness for the company and for future researchers to pay attention to these two factors. Bibliometric analysis will be used in this study, and the researcher also use Vosviewer to perform the analysis. The data used comes from the Scopus database with special keywords used and the selection of data to be analyzed based on the PRISMA framework so that systematics and transparency in data selection are carried out in a good procedural manner. The results of the study show that research related to organizational commitment and the Company's sustainability has been carried out quite a lot, which is shown by the existence of 204 publications related to organizational commitment and the Company's sustainability which have then gone through the process of selecting 150 articles that have been analyzed. Publications related to organizational commitment and corporate sustainability are most widely done in the area of social sciences, especially in sustainability journals (Switzerland), and the countries that have contributed the most in publications are Malaysia and Indonesia. This study recommends that companies can implement green human resource management in managing their human resources so that they can increase organizational commitments that support the company's sustainability, then future researchers can consider the keywords in network visualization for further research

Index Terms

Organizational Commitment, Sustainability, Corporate Sustainability, Bibliometric

The Impact of Creative Accounting on Company's Value of Banking Industry in Indonesia with Good Corporate Governance and Managerial Ownership as Moderating Variable

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This study sought to analyze the direct influence of creative accounting on Bankings' Value, with Good Corporate Governance and Managerial Ownership serving as moderators. The independent board of commissioners (BoC) and audit committee (AC) serve as proxies for good corporate governance. We analyze the Banks' value using three financial performance ratios: return on assets (ROA), return on equity (ROE), and net interest margin (NIM). This analysis is based on on data from 33 Indonesian banks from 2020 to 2023, including 132 observations. The data in this study were analyzed using generalized least squares method. By conducting statistical analysis with Eviews 11, a computional tool for time series econometrics. Our research found that creative accounting which is decided via discretionary accrual, has an impact ROA and NIM. Furthermore, BoC, AC, and managerial ownership (MO) may influence the impact of earnings management on ROA and NIM. However, according to the regression results, creative accounting has a minor impact on ROE. Our research adds to the body of empirical evidence that creative accounting fraud may have an influence on the Company's value. On the other hand, our research has revealed new information indicating that the involvement of the BoC, AC and MO may interfere with the influence of earnings management on the company's value which benefits for stakeholders.

Index Terms

AC, BoC, Creative Accounting, MO, ROA, ROE

Analysis of Deep Learning Algorithms for Grape Leaf Disease Detection

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Plant leaf diseases are crucial in agriculture as they can affect food security. Grapes are one of the important fruits we consume for health considerations. This paper aims to investigate the various deep learning algorithms focused on plant disease detection. A systematic literature review was conducted to determine the top three deep learning algorithms to be utilized in this paper. It also intends to compare the performance and accuracy of the top three deep learning algorithms with appropriate accuracy metrics. The top three deep learning algorithms identified from the systematic literature review were Convolutional Neural Network, EfficientNet, and MobileNetV2. The grape leaf images from the PlantVillage dataset which comprise Black Rot, ESCA, and Leaf Blight were used in this paper. There are a total of 3225 images which were divided into 80% training, 10% testing, and 10% validation. Normalization, augmentation, and hyperparameters were implemented in the training. The results revealed that the EfficientNet model got 100% accuracy, while MobileNetV2 and CNN got 98% and 78% respectively. In terms of prediction, the EfficientNet and MobileNetV2 models also successfully predicted all three images while the Convolutional Neural Network model only predicted two images correctly. This finding implies that the deep learning models EfficientNet and MobileNetV2 have potential utilization in image classification to detect grape leaf diseases.

Index Terms

CNN, Deep Learning, EfficientNet, Grape Leaf Diseases, MobileNetV2

Study of PVD Coatings in Combination with Smart Polymeric Additives for Enhanced Wear Resistance and Friction Reduction

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The integration of metallic elements into diamond-like carbon (DLC) coatings, particularly cobalt (Co-DLC), has attracted significant attention for enhancing functionalities in various applications. This study explores the interaction between functionalized polymers and Co-DLC coatings to elucidate their tribological properties and wear resistance. Co-DLC coatings were deposited on steel substrates using deep oscillation magnetron sputtering, and different Co concentrations were achieved by varying cobalt pallets. Tribological tests were conducted using ball-on-disk tribometry, revealing reduced friction and improved wear resistance of Co-DLC coatings when paired with PLMA-b-PDMAEMA polymer compared to PLMA. Surface characterization through SEM-EDS analysis unveiled the formation of transfer films derived from carbon-rich polymers, contributing to the observed reduction in wear rates. Overall, Co-doped DLC coatings exhibited promising potential in mitigating friction and enhancing wear resistance when combined with specific functionalized polymers, indicating avenues for diverse industrial applications. This comprehensive investigation not only advances the understanding of tribological behavior but also facilitates the development of tailored materials with superior performance in real-world applications.

Index Terms

Copolymer, Sliding Friction, DLC Coatings

The Moderating Role of Collectivism on the Relationship Between Self-Compassion and Compassion for Others of Filipino College Students

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Compassion fosters personal growth and communal well-being, yet its cultural underpinnings, particularly in collectivistic societies, remain underexplored. This study addresses this gap by examining the compassionate experiences of Filipino students, focusing on the relationship between self-compassion and compassion for others, and the moderating role of collectivism. Using a sample of 367 students, the results revealed moderate levels of self-compassion, indicating students' efforts to care for themselves despite challenges. In contrast, compassion for others was high, reflecting strong group-oriented values. Correlational analysis showed a positive relationship between self-compassion and compassion for others ($r = 0.41$), indicating that greater self-compassion is linked to increased compassion for others. While overall collectivism did not moderate this relationship, horizontal collectivism-emphasizing equality and harmony-significantly strengthened the association ($B = 0.32$, $p < .001$). These findings suggest that Filipino students' compassion is shaped by cultural values that prioritize egalitarian relationships rather than hierarchical structures. The study underscores the importance of integrating compassion into higher education curricula, particularly in general education courses like Understanding the Self. Additionally, promoting equality and inclusivity within educational institutions can further enhance the benefits of compassion, fostering environments that reduce hierarchical barriers and encourage mutual support. This research contributes to the understanding of how collectivist values influence compassion, filling a notable gap in literature on culture and compassion.

Relationship Between Forgiveness and Resilience Among Young Adults in Baguio City, Philippines

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Young adults are navigating a critical period of transition, marked by challenges that test their emotional resilience. In this journey, forgiveness plays a crucial role by helping them release offenses, personal mistakes, and uncontrollable circumstances, which strengthens their capacity to bounce back and thrive. This descriptive-correlational study examined the relationship between forgiveness and resilience among 388 young adult college students at the University of the Cordilleras in Baguio City, Philippines. The study also evaluated forgiveness levels among young adults across three dimensions (self, others, situations) and resilience across three aspects (mastery, relatedness, emotional reactivity). Data were collected through adopted questionnaires (Heartland Forgiveness Scale and Resilience and Resiliency Scale for Young Adults). The study found a weak positive correlation between forgiveness and resilience based on the computation of Pearson R, the value of 0.22, and with the p-value of <0.05, which suggests that as forgiveness levels increase, there is a slight tendency for resilience to also increase. This outcome highlights the complex nature of the relationship, with potential influences from factors like coping mechanisms and social support. The study contributes to understanding how forgiveness and resilience interact in young adults, emphasizing the importance of self-compassion and emotional regulation in fostering resilience.

ICAKMPET

Development of an Adaptive Game-based Learning Environment for Teaching Basic Programming Concepts

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Gamification has gained significant popularity in education due to its interactive and engaging nature, making it particularly effective for teaching abstract concepts like programming. Studies highlight the advantages of Gamification and Game-Based Learning Environments (GBLE) in programming education, emphasizing interactivity as a key motivator. This study investigates the impact of integrating personalized learning experiences into a GBLE on teaching programming fundamentals. Using Roblox Studio, a customized GBLE was developed to teach basic programming concepts, allowing respondents to explore the environment freely while data collected during their interactions informed personalized adaptations. Results indicate that GBLEs are especially beneficial for learners with little or no prior programming knowledge, enhancing their understanding and engagement. The findings suggest that gamification, game-based learning, and similar approaches should be explored for teaching abstract, interactive, and visualization-heavy subjects. Moreover, integrating personalization within GBLEs significantly enhances their effectiveness in catering to diverse learning styles and experiences.

Index Terms

Gamification, Game-based Learning, Programming Education, Educational Technology

Optimization and Analysis of CO2 Capture in RPB using Cognitive Computing and Evolutionary Algorithm

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Due to industrialization, deforestation and many other anthropogenic activities, carbon emission is increasing at a rate of approximately at a rate of 1% in past few years. Now, reduction of atmospheric carbon dioxide (CO_2) has become a significant concern and challenge for every country across the globe. This paper is a sincere effort to study, analyse and further optimize, amine based post-combustion carbon (PCC) capture. The chemical absorption of CO_2 utilising aqueous monoethanolamine (MEA) in rotating packed beds (RPB) has been extensively investigated. Enhancing the efficiency of the CO_2 capture process necessitates a comprehensive understanding of the complex interrelationships among the key parameters. This study focuses on the modelling and optimisation of CO_2 absorption efficiency in MEA by artificial intelligence and genetic algorithms (GA). Machine learning (ML) and Artificial Neural Networks (ANN) are versatile instruments employed to model and forecast diverse complex and highly non-linear phenomena. The established process models have been established by published steady-state experimental data. Subsequently, SHAP analysis has been applied that reveals the absorbent-based input factors such as solvent temperature, flow rate, and rotational speed are the primary determinants of CO_2 absorption in RPB. To assess the model's performance, the acquired results have been examined using statistical measures, including MSE, RMSE, and $R2$ value. The modelling results have been utilised to optimise CO_2 absorption, employing GA under various operating conditions to ascertain the optimal operating ranges for the input variables that correlate to the maximum CO_2 capture level.

The Role of Machine Learning Algorithms for Diagnosing Diabetes Mellitus Based on Different Datasets with Different Attributes

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Undiagnosed diabetes can lead to a variety of complications, including retinopathy, nephropathy, neuropathy, and multiple vascular disorders. Both type 1 and type 2 diabetes are major global causes of mortality and are linked to conditions such as renal diseases, visual impairments, and cardiovascular diseases. This paper employs data mining techniques and machine learning algorithms to effectively predict diabetes. We focus on three different datasets with varying attributes that complement each other. The commonly used Pima Indian dataset lacks essential information, such as HbA1c levels, which are crucial for diabetes research. In contrast, the Iraq dataset includes HbA1c levels along with risk factors, such as hyperlipidemia tests that measure cholesterol, triglycerides, high-density lipoproteins (HDL), and low-density lipoproteins (LDL). This provides a more comprehensive evaluation of type 2 diabetes. Our data mining process involves data cleaning and ensuring data integrity. We compare various machine learning algorithms, including Logistic Regression, Random Forest, Gradient Boosting, Gaussian Naive Bayes, Decision Tree, and K-Neighbors, to identify the most effective method for diabetes prediction. The methodology relies on the predictive accuracy of robust machine learning algorithms, evaluated through multiple metrics such as precision, recall, and F1 score. We utilized k-fold cross-validation and train-test split techniques to assess the models. The results indicate that Gradient Boosting performed best in predicting diabetes within the Pima Indian dataset, while the K-Neighbors algorithm demonstrated superior performance in the Healthcare Diabetes dataset. Moreover, the Decision Tree method showed greater efficiency in the Iraq dataset compared to the other algorithms.

Index Terms

Diabetes Prediction, Machine Learning, Data Mining, fuzzy system, Logistic Regression LR, Random Forest RF, Gradient Boosting GB, Gaussian NB GNB, Decision Tree DT, K Neighbors KNN

A Systematic Analysis of the Role of Artificial Intelligence in Digital Business Transformation

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This study explores the transformative impact of artificial intelligence (AI) in shaping the digital business landscape through a bibliometric analysis. The research maps the growth and development of AI-related studies in the digital business domain over the past five years by employing co-citation and co-word analysis methods. Data was sourced from the Scopus database, focusing on peer-reviewed journal publications between 2019 and 2023. The findings reveal a significant increase in AI research across various sectors, highlighting its expanding relevance and potential in driving digital business innovation. The study identifies four primary areas where AI has made notable contributions: digital transformation, human resource management, business and economic strategy, and cross-industry applications. AI is a critical enabler for process automation, predictive analytics, and personalized services, fostering operational efficiency and enhancing competitive advantage. This research underscores AI's role in improving decision-making, optimizing workflows, and creating new business models that align with the demands of the digital era. Through the lens of the People, Process, and Technology (PPT) framework, the study introduces a conceptual model that illustrates how integrating AI successfully requires harmonizing human capital, optimized processes, and advanced technology. The insights from this study provide valuable guidance for academics, industry leaders, and policymakers, offering strategic directions for leveraging AI to drive long-term business growth and innovation in the digital economy.

Index Terms

Diabetes Prediction, Machine Learning, Data Mining, fuzzy system, Logistic Regression LR, Random Forest RF, Gradient Boosting GB, Gaussian NB GNB, Decision Tree DT, K Neighbors KNN

Adaptive Scheduling heuristic Priority Linear Regression (ASH-PLR): A Novel CPU Scheduling Algorithm using Predictive Priority Levels

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Inadequate implementation of parameters such as priority levels can be seen in many common and contemporary scheduling algorithms which can lead to starvation. With the rise of industry 4.0, the advancement of computers and operating systems require more efficient and optimized scheduling algorithms to assess big data. This study aims to explore and develop a novel and heuristic approach to scheduling algorithms by incorporating predictive models in machine learning, more specifically the linear regression model to predict and allocate the most efficient priority level to each process upon execution. The newly developed ASH-PLR algorithm was tested against common and contemporary scheduling algorithms such as the FCFS, AMRR, and the MMRRA in terms of their Average Turnaround Time, Average Waiting Time, and Context Switches. The results indicate that the ASH-PLR is the superior scheduling algorithm when it comes to processes that have shorter burst times and extensively outperforms the FCFS and MMRRA in terms of Average Turnaround Time and Average Waiting Time. ASH-PLR displays the ability of predictive models to be integrated in future algorithms for better optimizations in upcoming new technology.

Exploring the Challenges and Vulnerabilities of SDN in Campus Network Security

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Today, Campus networks face unprecedented challenges in terms of scalability, security and performance wherein traditional network architecture is striving hard to achieve this goal. This systematic review evaluates Software-Defined Networking (SDN) as transformative solution to centralized yet dynamic network control and management and increased operational efficiency for an academic institution. Software-Defined Networking (SDN) decouples the control and data plane, it is possible to make real-time changes and quick reconfigurations to optimize the flow of traffic and minimize problems such as latency and packet loss. This flexibility comes along with vulnerabilities notably in central control points who is susceptible to Distributed Denial of Service Attacks (DDoS) and spreading of malware which requires robust security measures. While Integration of artificial intelligence (AI) into SDN, SDN can strengthens intrusion detection it also opens the floodgates for vulnerabilities and heightens the risk of cyberattacks. Strategies to mitigate these problems include the use of multiple controller clusters, load-balancing architecture, and federated learning for privacy preserving intrusion detection. This paper shows that the academic institution should adopts strict and proactive security measures and monitoring to protect against cyber threats, through SDN since it emphasizes scalability and resilience. SDN can also transform the network administration efficiently.

Index Terms

SDN Challenges in Campus Network, SDN Challenges, SDN Vulnerabilities in Campus Network, Software-Define Networking Vulnerabilities, Challenges in Software-Define Networking

Adopting Eco-Friendly Construction Materials for Climate Resilience: Insights from a Community Seminar in Puerto Princesa

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The construction industry significantly contributes to global carbon emissions, making the adoption of eco-friendly construction materials essential for sustainable development. This paper presents the outcomes of a seminar conducted in Barangay Cabayugan, Puerto Princesa City, Palawan, aimed at promoting eco-friendly construction practices. Organized by the Civil Engineering Department of Western Philippines University, the seminar engaged 41 local participants, including Barangay officials and residents, in discussions on sustainable construction techniques and materials. The seminar focused on climate change adaptation, risk reduction, and the empowerment of the local community to reduce poverty through sustainable building practices. The event utilized a combination of lectures, hands-on workshops, and group discussions to explore innovative eco-friendly materials that can minimize environmental impact while improving local construction standards. Feedback from participants indicated a strong interest in incorporating these practices into their communities. This paper highlights the methodologies used in the seminar, the challenges encountered, and the potential for expanding such community-based programs to support the Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action). The insights gained suggest that empowering local communities through education and practical training can play a pivotal role in promoting eco-friendly construction practices across developing regions.

Index Terms

Eco-Friendly Construction Materials, Sustainable Building Practices, Community-Based Initiatives, Climate Change Adaptation, Sustainable Development Goals (SDGs)

Green Marketing Strategy for Sustainable Green Tourism Development in Olango Island Lapu-Lapu City Cebu, Philippines

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This study explored the relationship between green marketing, green tourism, and sustainable tourism in Olango Island, Lapu-Lapu City, Philippines, with the aim of developing a green marketing strategy that would support sustainable green tourism development in the area. The study employed a quantitative research method and utilized the Structural Equation Modeling (SEM) approach to analyze the direct and indirect effects of Green Marketing (X) on Green Tourism and Sustainable Tourism (Z). The findings showed that green marketing had a significant impact on green tourism, indicating that focused green marketing could attract environmentally conscious tourists and encourage sustainable behavior. Sustainable tourism and green marketing also worked together, as businesses were compelled to incorporate sustainable practices into their marketing plans since visitors valued sustainability. However, sustainable tourism had little impact on green tourism, suggesting that other factors may have influenced tourists' choices and actions. The study concluded that a comprehensive green marketing strategy could boost the destinations competitiveness and appeal while maintaining its natural and cultural heritage. The findings also highlighted the need for a comprehensive destination management strategy beyond sustainability programs, including community involvement, building a strong destination reputation, and investing in physical structures and facilities to improve tourist satisfaction. The study provided actionable recommendations for effective green marketing strategies for sustainable green tourism development in Olango Island.

Index Terms

Olango Island, Green Marketing, Sustainable Tourism, Green Tourism, Structural Equation Modeling (SEM)

Service Efficiency of Online Banking: Perceived Customer Satisfaction among E-Users of Bank Transaction

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This study investigated the perceived customer satisfaction of bank transaction e-users, with a focus on the service efficiency of online banking. It aimed to shed light on the relationship between service efficiency and customer satisfaction in the field of online banking by studying user experiences and feedbacks. This study employed a descriptive research design and utilized the survey method to gather data. The researcher employed purposive sampling to specifically target online banking users or customers as the focus of the study. The role of online banking was described in terms of time saving, ease of use, speed, and clear instructions. The respondents consistently perceived online banking as convenient in resolving problems and saving time. They also found it easy to use and not complicated. However, they occasionally encountered minor speed issues during peak times. Furthermore, the adoption of online banking positively influenced the clarity and up-to-datedness of instructions and information. It is then recommended that bank service providers should prioritize sustaining and innovating non-physical services like phone calls, emails, and chats, while also maintaining user-friendly mobile banking applications. Regular monitoring of application performance during congested times and ensuring up-to-date content which are crucial for enhancing customer satisfaction.

Index Terms

Customer Satisfaction, Online Banking, Service Efficiency, Customer Feedback, Mobile Banking Applications

The Power of Local Resources: An Asset-Based Approach to Rural Development

Catherine E. Dela Cruz , *Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines &*
College of Management and Business Technology, Philippines

The study applies the asset-based community development (ABCD) approach to Barangays Polilio and Palagay in Cabanatuan City, Philippines, aiming to identify local strengths and resources for sustainable development. The research fosters self-reliance and proactive growth by focusing on community assets rather than deficiencies. The study identifies key assets, including agricultural resources, skilled labor, and social networks using participatory rural appraisal (PRA) techniques—focus group discussions, key informant interviews, and surveys. Thematic and statistical analyses were employed to create comprehensive asset maps, revealing development opportunities tailored to each barangay's unique context. The findings led to the design of an extension program tailored to enhance local capacity and sustainability. For Barangay Polilio, the program emphasizes modern agricultural training and access to technology to improve farming efficiency and productivity. In Barangay Palagay, the extension program focuses on fostering small-scale industries and improving infrastructure through workshops on entrepreneurship and resource management. Both programs integrate community-driven initiatives to ensure local ownership and long-term impact. This study exemplifies how the ABCD approach can empower rural communities by translating research insights into actionable programs. The extension programs not only address immediate needs but also build a foundation for sustainable and resilient development, serving as a replicable model for similar rural contexts.

Index Terms

Rural Development, Participatory Rural Appraisal (PRA), Community Empowerment, Sustainable Development

Vermicomposting Unveiled: Assessing Feasibility for Sustainable Farming and Commercial Success

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Catherine E. Dela Cruz, *Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines & College of Management and Business Technology, Philippines*

This study assesses the viability of vermicomposting in General M. Natividad, Nueva Ecija, using a feasibility assessment framework as a basis for potential commercialization. By focusing on 50 farm owners from selected barangays, the research evaluates farmers' demographic profiles, awareness of the limitations of chemical fertilizers, and knowledge of vermicomposting as a biofertilizer, waste management tool, and business opportunity. The findings indicate that while farmers are highly aware of the rising costs and supply challenges of chemical fertilizers, they lack knowledge about the environmental and economic benefits of vermicomposting. Furthermore, the study highlights the potential for vermicomposting to serve as a sustainable alternative to chemical fertilizers, improve waste management, and create livelihood opportunities. Recommendations include the promotion of vermicomposting through local government initiatives, seminars, and policy development to achieve Sustainable Development Goals (SDGs), particularly climate action. This study underscores the importance of community awareness and training to unlock the commercialization potential of vermicomposting in rural areas.

Index Terms

Vermicomposting, Biofertilizer, Waste Management, Environmental Conservation, Chemical Fertilizer Substitute, Business Opportunity, Sustainable Agriculture, SDG Climate Action

Assessing the Drivers and Barriers in Farmers' Adoption of Technology and Innovations for Sustainable Agricultural Practices

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Jonas Emmanuel C. Navarroz, *Nueva Ecija University of Science and Technology, Cabanatuan City, Philippines & College of Management and Business Technology, Philippines*

The study explores the determinants influencing the adoption of agricultural technologies and innovations among farmers in Barangay Panacsac, Gen. Mamerto Natividad, Nueva Ecija, Philippines. Specifically, it examines the demographic and socio-economic profiles of farmers, including age, years of farming experience, educational attainment, land ownership, types of mechanization used, organizational affiliation, and participation in agricultural training activities. The research also evaluates key factors—economic, socio-cultural, institutional, and technological—that affect technology adoption, identifies challenges faced by farmers, and assesses the impact of technology adoption on agricultural production processes. A quantitative descriptive research design was employed, involving 114 purposively selected farmers who participated in a structured survey. Results highlight that socio-cultural factors play the most significant role in influencing technology adoption, while financial constraints, limited access to loans, inadequate resources, and insufficient technical support emerge as major barriers. Despite these challenges, the adoption of modern technologies has demonstrably enhanced crop yields and streamlined production processes. This study underscores the urgent need for targeted policy interventions, such as affordable credit mechanisms, capacity-building initiatives, and training programs to empower farmers and accelerate the adoption of agricultural innovations. By addressing financial and institutional barriers, the findings provide a roadmap for enhancing agricultural productivity and sustainability in rural contexts.

Index Terms

Agricultural Technology Adoption, Barriers to Innovation, Agricultural Mechanization, Agricultural Productivity, Sustainable Farming

Development and Assessment of TrAcad: Smart Student Tracking using Simple Boolean and Conditional Algorithm

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TrAcad is an innovative system developed to streamline and automate the student tracking process at the College of Information and Communications Technology, Nueva Ecija University of Science and Technology (NEUST). Central to TrAcad's functionality are straightforward Boolean and conditional algorithms, which enable the system to make precise, data-driven decisions, facilitating accurate student progress tracking.

The study was conducted in two distinct phases: Development and Assessment. During the Development Phase, the project adhered to the Software Development Life Cycle (SDLC), progressing through the stages of planning, designing, coding, testing, and deployment. Boolean logic played a key role in answering binary questions, such as whether a student met specific criteria, while conditional algorithms managed more complex evaluations, such as identifying students requiring additional support.

In the Assessment Phase, a panel of IT experts evaluated the system's technical quality, while Guidance Coordinators and Class Advisers assessed its practical application in real-world scenarios. These assessments were conducted using established software quality standards.

The results were highly favorable—TrAcad was evaluated as efficient, reliable, secure, user-friendly, and flexible. The analysis highlighted the importance of Boolean and conditional algorithms in achieving accurate and effective student tracking. Future enhancements include expanding performance monitoring capabilities and integrating the system with the university's main records database for a more comprehensive view of student progress.

Index Terms

Student Tracking System, Boolean Algorithm, Conditional Algorithm, Software Development Life Cycle, Decision-Making, Software Quality Standards

Status of Mango Industry in Nueva Ecija: Basis for Development Plan

Dr. Nestor Dela Cruz Natividad, *Nueva Ecija University of Science and Technology, Philippines*

Dr. Sarah Calma Alvarez, *Nueva Ecija University of Science and Technology, Philippines*

This study aimed to describe and analyze the status of the mango industry in Nueva Ecija based on the Philippine Mango Industry Roadmap (2017-2022). This involved 100 mango growers who participated in the descriptive research design, which dug into describing farm practices, determining the cost and return, and analyzing the present situation of mango industry in terms of strengths, weaknesses, opportunities, and threats (SWOT).

Due to numerous difficulties that mango growers were currently dealing with, the majority of them had to engage in contract spraying in order to carry out major farm activities, i.e., production and marketing. These comprised mainly a series of spraying activities for the insect pests and diseases control which modern times included fruit bagging. The result led to an output-sharing agreement that adversely affected the income of the mango growers.

The high prevalence of pests and diseases, as well as rising labor and input costs, were the biggest threats to the industry in the province that had an impact on the situation of mango growers, while the financial situation was weak. On the other hand, opportunities can also arise from the development of mango products with added value or distinctive processed commodities for the local and international market. It is suggested that the government may take measures to address these concerns by strengthening its programs in terms of research and development, extension support, education and training, financing, and facilities support services. The proposed Development Plan was also created to guide the industry, increase its performance and improve the mango growers' present situation.

Index Terms

Mango Industry, Philippine Mango Industry Roadmap, Nueva Ecija, Farm Practices, SWOT Analysis, Development Plan

Assessment of the "Buhos" System along the Admiral- IPI Road Segment in Las Piñas City using Simulation of Urban Mobility (SUMO)

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Sean Charles Sacanle, *College of Engineering, Pamantasan ng Lungsod ng Maynila, Philippines*

Kurt Cedric Sarmiento, *College of Engineering, Pamantasan ng Lungsod ng Maynila, Philippines*

Traffic congestion in Metro Manila, particularly along the Admiral-IPI Road in Las Piñas City, has prompted the use of various traffic management strategies, including the Buhos System. This contraflow management approach aims to reduce congestion but lacks sufficient local studies to prove its effectiveness. This research evaluates the Buhos System by analyzing the Automobile Level of Service (LOS) before and during its implementation using Simulation of Urban Mobility software. Field data collection revealed a base free-flow speed of 34.94 kph under low volume conditions. The primary metric for LOS assessment was the average travel speed as a percentage of the free-flow speed. Results showed that while the Buhos System improves travel speeds compared to pre-implementation conditions, it fails to stabilize traffic flow or achieve LOS C, indicating an ineffective solution. Simulated results further corroborated these findings, affirming the system's inability to bring traffic to a stable level. Thus, despite minor improvements in travel speeds, the Buhos System does not significantly alleviate traffic congestion. This underscores the need for more effective traffic management solutions to address the persistent transportation challenges in urban areas like Metro Manila.

Assessing the Needs for Collaboration between the Department of Education and Nueva Ecija University of Science and Technology: Research, Extension, and Training Perspectives

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Emerita S. Caymo, *Nueva Ecija University of Science and Technology, Philippines*

Dr. Rita L. Cajucom, *Nueva Ecija University of Science and Technology, Philippines*

This study assesses the needs for collaboration between the Department of Education (DepEd) and Nueva Ecija University of Science and Technology (NEUST) in the areas of research, extension services, and training. Through a descriptive-exploratory approach, the study identifies key areas where NEUST can support DepEd, including the training of master teachers in research methodologies and the development of coaches for dance sports and other physical education activities. Additionally, the study highlights challenges to collaboration, such as communication barriers and resource limitations. A sustainable partnership framework is proposed, focusing on joint planning, resource sharing, and the establishment of training hubs. These efforts aim to enhance educational practices, promote community engagement, and foster long-term collaboration aligned with the Sustainable Development Goals (SDG 4: Quality Education).

Index Terms

Collaboration, Department of Education, Nueva Ecija University of Science and Technology, Research Development, Extension Services, Training Programs, Master Teachers, Sports Development, Sustainable Partnership, Educational Practices

ICAKMPET

Quantitative Study about Engineering Student's Perspectives on Using Simulation Software as Educational Tool during this Post-Pandemic

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Dr. Ma. Rowena Caguiat, *De La Salle University, Manila, Philippines*

This preliminary study examines the perceptions of engineering students on the use of simulation software as an educational tool in the post-pandemic era. Employing the Technology Acceptance Model (TAM) with an additional perceived relevance construct, the study aimed to evaluate factors influencing students' acceptance and usage of simulation software in their learning processes. A pilot test was conducted with 42 undergraduate engineering students who had experience using simulation tools during and after the pandemic. Data were collected via a structured survey and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the validity and reliability of the theoretical framework. The findings of the quantitative study revealed that perceived usefulness, ease of use, and relevance significantly influenced key outcomes, such as attitude and actual use, while certain hypotheses—such as the effect of perceived relevance on behavioral intention—were not supported. The results highlight that simulation software remains a relevant and effective educational tool in enhancing learning, despite the return of in-person activities. This study underscores the importance of integrating perceived relevance into technology acceptance models to capture evolving student preferences and behaviors. These insights provide a foundation for further research and practical applications aimed at optimizing educational strategies in engineering and other disciplines.

Exploring the Psychological Safety of Employees at NEUST-SIC: Implications for Workplace Well-Being and Productivity

Eloisa C. Gabriel, *San Isidro Campus – College Of Education, Philippines*

This study aimed to determine the Psychological Safety of faculty and non-teaching personnel at Nueva Ecija University of Science and Technology San Isidro Campus. The descriptive method was utilized using the Psychological Safety instrument developed by Edmondson (2018). In determining the profiles of demographic variables (age, gender, educational attainment, years of service, position) and Psychological Safety, Frequencies-Percentage was used. Descriptive statistics was also utilized to describe and determine the respondents in terms of their level of psychological safety. The research is consisted of 53 respondents, faculty and non-teaching personnel presently employed at NEUST San Isidro campus. According to research findings, the majority of the respondents have some psychological safety but could increase, and only a few have a good amount of psychological safety. Finally, the findings suggest that the administration should sustain its rapport among the faculty and staff members by continuously breaking the barriers that exist between the members and leader, keeping the doors open for new ideas and innovations, and providing a larger space for improvements.

Student Motivation and Social Support in Online Distance Learning among Freshmen Social Support in Online Distance Learning among Freshmen College Students

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Ralph Vendel Musni, *University of Science Technology of Southern Philippines, Philippines*

The COVID-19 pandemic has reshaped educational delivery, highlighting the significance of Online Distance Learning (ODL) as a medium to address contemporary challenges. This study explores the relationship between social support and student motivation in ODL among 181 first-year college students from Public Administration and Business Administration programs (academic year 2023–2024). Employing a descriptive-correlational research method with stratified random sampling, the study investigates the students' demographic profiles, levels of intrinsic and extrinsic motivation, and the forms of social support received from educational institutions—emotional, informational, instrumental, and affirmational.

The findings reveal that students exhibit high levels of motivation (including intrinsic motivation, extrinsic motivation, and amotivation) and substantial social support. Social support, particularly emotional and affirmational, is pivotal in fostering academic perseverance. While demographic factors such as age, sex, and type of gadget used show no significant differences in motivation or perceived support, variations are evident when grouped by college and family income. Furthermore, the study confirms a moderate positive correlation between social support and motivation, emphasizing that a supportive environment enhances students' engagement and resilience in online learning. The study underscores the need for tailored social support programs to sustain and improve students' motivation in ODL settings.

Index Terms

Online Distance Learning, Social Support, Student Motivation, Intrinsic Motivation, Extrinsic Motivation, Educational Resilience

Exploring Digital Literacy for Youth Employment: A Mixed-Method Comparative Case using Digital Literacy Global Framework 4.4.2

Joshua Isaguirre, *De La Salle University, Manila, Philippines*

Dr. Michelle Renee Ching, *De La Salle University, Manila, Philippines*

This study addresses the gap in understanding the digital literacy competencies of undergraduates and out-of-school youth in the context of employment through digital content creation in the Home Office set up. Despite the growing importance of digital skills in today's workforce, limited research explores how these competencies can be effectively developed among marginalized youth. Guided by the Digital Literacy Global Framework (DLGF) 4.4.2, which aligns with the United Nations' Sustainable Development Goal (SDG) 4.4 on improving youth digital proficiency, this study aims to assess initial skill levels, prioritize competency areas, and identify effective training strategies. Using a mixed-methods approach, the study examined four Home Office cases through surveys and interviews. Quantitative surveys evaluated digital literacy competencies across seven domains defined by the DLGF 4.4.2 framework, while qualitative interviews explored training methodologies and challenges. Data analysis involved thematic analysis and descriptive statistics. Findings reveal that while participants exhibit strengths in communication and information literacy, they lack career-related digital competencies and problem-solving skills. The study also highlights best practices in training design, including structured onboarding programs, tool-focused education, and task-specific training. This research is significant as it bridges the gap between theoretical frameworks and practical implementation, offering insights into how digital literacy can be leveraged to enhance youth employability. By aligning with global sustainable development goals, it underscores the relevance of targeted training interventions in addressing skill deficits and empowering marginalized youth for workforce integration.

Barangay Peace and Order Committee Level of Knowledge: Duties and Function in Crime Prevention in Northern Samar

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This Study was conduct to determine the Barangay Peace and Order Committee Level of Knowledge: Their Duties and Function in Crime Prevention in Northern Samar. Specifically, it aimed to document the demographic profile of respondents in term of age, sex, civil status, educational attainment, number of years in service as a member of the Barangay Peace and Order Committee in relation to crime prevention and detection and determine the duties and function as well as the level of knowledge in crime prevention and detection.

The descriptive-correlational method of research was used in this study. Forty members of the Barangay Peace and Order Committee in selected barangays in Palapag, Nothern Samar served as the respondents of this study. Frequency counts, percentages and weighted mean, were used to analyze the descriptive data collected from the respondents.

Most of the respondents were male, forty to fifty years old, married, and college graduates, and had been in service for six to ten years. The respondents were very much "knowledgeable" on their duties and function in crime prevention and detection. It is then recommended that committee members should continue to perform well and to ensure the effectiveness of the member there is a need to systematize their daily routine activities in implementation of peace and order.

Educational Values of Sufism in The Local Poetry of Kabhanti Bunga Malati from Buton

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This article explains the concept of sufi ethics (tasawuf akhlaki) and its elaboration in the local poetry of Buton community, known as Kabhanti Bunga Malati. Khabanti is a Wolio language poem that is the result of the amalgamation of Buton Sultanate's local culture with Islamic values, containing various Islamic teaching and wisdom. This research is a library research with the manuscript text of Kabhanti Bunga malati serves as the primary source of data, which is available in the online manuscript catalog of the British Library with the code EAP212/3/23. The Bunga Malati text is analyzed using Paul Ricoeur's hermeneutical theory to uncover the meanings of symbols used in the text. The outcomes of this research indicate that the Khabanti Bunga Malati text elaborates the teachings of sufi ethics (tasawuf akhlaki) through the system of moral development known as takhalli, tahalli and tajalli. This reveals that the Khabanti Bunga Malati is seen and believed to be one of the initiatives of sufi education in the Buton Sultanate, which combines local cultural elements in the form of community poetry with Islamic values.

Index Terms

Hermeneutics, Philology, Kabhanti, Local Poetry, Sufism

Empowering Learners and Educators: A Needs Assessment-Based Framework for Training and Extension Programs in the Alternative Learning System

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This study, titled "Empowering Learners and Educators: A Needs Assessment-Based Framework for Training and Extension Programs in the Alternative Learning System," investigates the challenges faced by learners and educators in the Alternative Learning System (ALS) in San Isidro, Nueva Ecija. ALS is essential for providing educational opportunities to individuals who lack access to formal schooling. Yet, it encounters significant obstacles, including insufficient educator training and inadequate resources tailored to learner needs. Utilizing a descriptive qualitative methodology, the research involved focus group discussions with 20 ALS learners, two teachers, and one coordinator. The findings highlight critical issues such as limited learning materials, reliance on traditional teaching methods, and learners' difficulties with English communication and mathematics comprehension. These challenges are compounded by low parental support and inconsistent student attendance. To address these issues, the study proposes a comprehensive training framework called "Liwanag-Ar-ALS," which focuses on enhancing communication skills, mathematical proficiency, teaching strategies for diverse adult learners, and parental involvement. The framework aims to empower learners and educators by aligning training programs with their needs. The research underscores the importance of continuous assessment of ALS programs to adapt to evolving educational demands. By fostering community engagement and collaboration with educational institutions, the study aims to strengthen ALS's effectiveness in empowering individuals and communities through education. Ultimately, this framework serves as a strategic guide for developing targeted professional development opportunities that enhance the learning experience within the ALS context.

Status of Mango Industry in Nueva Ecija: Basis for Development Plan

Dr. Nestor Dela Cruz Natividad, *Nueva Ecija University of Science and Technology, Philippines*

Dr. Sarah Calma Alvarez, *Nueva Ecija University of Science and Technology, Philippines*

This study aimed to describe and analyze the status of the mango industry in Nueva Ecija based on the Philippine Mango Industry Roadmap (2017-2022). This involved 100 mango growers who participated in the descriptive research design, which dug into describing farm practices, determining the cost and return, and analyzing the present situation of mango industry in terms of strengths, weaknesses, opportunities, and threats (SWOT).

Due to numerous difficulties that mango growers were currently dealing with, the majority of them had to engage in contract spraying in order to carry out major farm activities, i.e., production and marketing. These comprised mainly a series of spraying activities for the insect pests and diseases control which modern times included fruit bagging. The result led to an output-sharing agreement that adversely affected the income of the mango growers.

The high prevalence of pests and diseases, as well as rising labor and input costs, were the biggest threats to the industry in the province that had an impact on the situation of mango growers, while the financial situation was weak. On the other hand, opportunities can also arise from the development of mango products with added value or distinctive processed commodities for the local and international market. It is suggested that the government may take measures to address these concerns by strengthening its programs in terms of research and development, extension support, education and training, financing, and facilities support services. The proposed Development Plan was also created to guide the industry, increase its performance and improve the mango growers' present situation.

Index Terms

Mango Industry, Philippine Mango Industry Roadmap, Nueva Ecija, Farm Practices, SWOT Analysis, Development Plan

Sociolinguistic Studies in the *Manuscript Of Qaṣīdah Li Aṣ-Ṣibyān* by Kyai Sholeh Tsani

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The *Qaṣīdah Li aṣ-Ṣibyān* manuscript is a work written by one of the Kyai from Gresik, Kyai Sholeh Tsani, in the form of kasidah verses. The aim of this research is to analyze the use of language in the *Qaṣīdah Li aṣ-Ṣibyān* manuscript as a representation of life at that time. In carrying out this analysis, the researcher used a descriptive-analytical method referring to sociolinguistic theories. Sociolinguistic studies in the *Qaṣīdah Li aṣ-Ṣibyān* manuscript provide a deeper understanding of the relationship between language and society in the past. This research can be used as a reference for current sociolinguistic studies and shows the importance of paying attention to social and cultural context in language analysis. The results of this research indicate that the *Qaṣīdah Li aṣ-Ṣibyān* manuscript can be studied from a sociolinguistic perspective to understand the social and cultural context of the time it was written, provide insight into the diversity of languages in society in the past and provide a deeper understanding of the relationship between language and society.

Index Terms

Manuscript, *Qaṣīdah Li aṣ-Ṣibyān*, Sosiolinguistic

Combining Deep Learning and Image Processing Methods for Glucose Content Analysis

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Traditional glucose monitoring methods often necessitate invasive procedures, posing potential risks to the immune system, particularly with repeated injections. This research attempts to adopt a non-invasive approach to analyze glucose concentration by leveraging image processing and Convolutional Neural Networks. Our study utilizes urine image samples for glucose assessment and subsequently classifying diabetes. We apply image processing methods like Gaussian filtering and resizing to enhance the input data for a CNN, leveraging its exceptional strength in extracting features and recognizing patterns. The system aims for high accuracy in classifying glucose levels into categories such as normal, pre-diabetes, and diabetes, offering a reliable and non-invasive alternative to conventional glucose monitoring techniques. Finally, the performance of our glucose content analysis scheme was validated using the results obtained.

Index Terms

Glucose, Gaussian Filter, Convolutional Neural Network, Diabetes, Deep Learning Technique, And Classification

Developing a Computer Vision Model to Classify Abaca Fibers Using YOLOv8

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Abaca (Musa textilis) is a plant native to the Philippines and is being harvested for its fiber. The Philippines currently leads in the global production of abaca fiber, which comprises of 87% of the world's abaca supply. After harvesting the fibers, the abaca fibers are then classified according to their grade. This process is done by visually inspecting the fibers. This process is time-consuming, especially for Grading and Baling Establishments (GBEs) and trading stations with few licensed abaca fiber classifiers. This study introduces an abaca fiber classification system that can classify grades S2 and S3 abaca fibers. The abaca fibers were captured in various settings and light sources. This study uses YOLOv8s to train the classification system. The model managed to achieve a mAP50 of 99.11% and a mAP50-95 of 91.93%, which means that the model performs well in classifying abaca fibers. The results of this study would greatly help GBEs and trading stations in quickly classifying abaca fibers while ensuring their overall quality.

Index Terms

Abaca Fiber Grade, Computer Vision, Deep learning, YOLOv8, Fiber Classification

Optimization of Land and Building Tax Absorption through 3-Dimensional Modeling and Digital Twin Visualization from Aerial Photo Survey

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The era of digitalization and the advancement of information technology for mapping and modeling three-dimensional (3D) space has become an important factor in various sectors, including in land and building management. In Indonesia, the potential for utilizing 3D mapping technology can be used to optimize the absorption of Land and Building Tax (PBB) which is still not optimal. This is caused by various factors, one of which is the lack of accurate and comprehensive mapping. Aerial photo mapping is the main technology often used in 3D GIS (Geographic Information System) modeling. Visualization of the results of 3D modeling and digital twins in Kelurahan Jawa, Samarinda is modeled as an interactive tool for policy makers to improve operational efficiency in property tax management. The results of this study reveal how the geodatabase is compiled, the creation of 3D multipatch from oblique aerial photo acquisition to digital twin visualization with CE90 accuracy of 0.139 m and LE90 of 0.282 m. In addition, the quality of this accurate digital twin is indicated by mean difference 0.473 m and RMSE value of the building height of 0.561 m. The results of the photogrammetry method compared to BAPENDA data on an area of 92 Ha have a mean difference in building area of 73.98 m² and a total area difference of 114,747 m². Finally, this study was able to optimize regional income related to land and building tax from IDR 949,962,806 to IDR 1,112,471,515. This was able to optimize land and building tax in order to increase regional income by IDR 162,508,709 or 17.10%. This study clearly has a significant financial impact on the local government.

Index Terms

Digital Twin, Land and Building Tax, 3D Mapping, Oblique Photogrammetry

Comprehensive Analysis of Consumer Sentiments and Topic Modeling on Samsung Z Fold Reviews Using NLP Techniques

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This investigation utilizes sophisticated Natural Language Processing (NLP) methodologies to assess public sentiment and topic modeling regarding the Samsung Z Fold, analyzing a corpus of 15,454 YouTube comments. The research employs Latent Dirichlet Allocation (LDA) for topic identification and VADER for sentiment classification into positive, negative, and neutral categories. Results indicate that 48.5% of comments reflect positive sentiments, signifying a favorable consumer viewpoint on the Samsung Z Fold's innovative attributes and efficacy. In contrast, 18.3% of comments are negative, pointing to potential enhancements, especially in technical features and pricing strategies. The study additionally juxtaposes LDA with Hierarchical Dirichlet Process (HDP) and Latent Semantic Indexing (LSI).

Index Terms

LDA, Sentiment Analysis VADER, NLTK

The Impact of Economic Accessibility of Healthcare Services on the Health of Elderly Individuals in China

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China is entering an aging society. An aging society will create a huge demand for healthcare services and increase healthcare costs for the entire society. Therefore, it is crucial to explore the factors that influence the health of the elderly. This study uses a sample from the China Family Panel Studies (CFPS) and employs a panel fixed-effects regression model to examine the impact of economic accessibility to healthcare services on the health of the elderly. The empirical results show that the economic accessibility of healthcare services has a significant impact on the health of the elderly. The results of the mechanism analysis indicate that this effect is primarily driven by the increased likelihood of exercise among the elderly due to improved healthcare accessibility. The impact is more pronounced among women, suggesting a greater sensitivity of their mental health to healthcare accessibility. Additionally, while the effects are slightly stronger for those aged 80 and above, the differences across age groups are relatively small, indicating consistent benefits across cohorts. These findings highlight the critical role of economic accessibility in promoting the well-being of the elderly. Healthcare policies should focus on reducing the economic burden of medical expenses for the elderly.

Index Terms

Economic Accessibility, Health Services, Health of the Elderly, China

ICAKMPET

The utilization of Cloud Computing Services (CCS) in Achieving Competitive Advantages among MD Status Company: A Conceptual Framework

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The integration of advanced technologies, particularly cloud computing services (CCS), has intensified competition across various business sectors as organizations strive to meet the ever-changing demands of their customers. Organizations are increasingly utilising CCS to gain competitive advantages, a trend that is becoming widespread. However, organizations with insufficiently skilled employees may find it difficult to fully utilise the capabilities of cloud technology, which could put them at a competitive disadvantage. This paper aims to explore the connections between the mediating role of information system (IS) processes and the factors involved in achieving competitive advantages through CCS. IS processes will act as a mediator between the adoption of cloud technologies and their successful integration into organizational workflows, influencing efficiency, decision-making, and value generation. This study concentrates on several practical strategies for leveraging CCS to achieve a competitive advantage. These include training and developing employees' skills, exploring how organizational culture affects the use of cloud technology, and creating metrics or models to measure how CCS help create measurable competitive advantages.

Index Terms

Competitive Advantages, Cloud Computing Services, MD Status Companies, Information System Process

Educational Values of Sufism in the Local Poetry of Kabhanti Bunga Malati from Buton, Southeast Sulawesi

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This article explains the concept of sufi ethics (tasawuf akhlaki) and its elaboration in the local poetry of Buton community, known as Kabhanti Bunga Malati. Khabanti is a Wolio language poem that is the result of the amalgamation of Buton Sultanate's local culture with Islamic values, containing various Islamic teaching and wisdom. This research is a library research with the manuscript text of Kabhanti Bunga malati serves as the primary source of data, which is available in the online manuscript catalog of the British Library with the code EAP212/3/23. The Bunga Malati text is analyzed using Paul Ricoeur's hermeneutical theory to uncover the meanings of symbols used in the text. The outcomes of this research indicate that the Khabanti Bunga Malati text elaborates the teachings of sufi ethics (tasawuf akhlaki) through the system of moral development known as takhalli, tahalli and tajalli. This reveals that the Khabanti Bunga Malati is seen and believed to be one of the initiatives of sufi education in the Buton Sultanate, which combines local cultural elements in the form of community poetry with Islamic values.

Index Terms

Hermeneutics, Kabhanti, Philology, Sufi Ethics

Health-Seeking Behavior, Knowledge, Social Stigma, and Adherence to Protocols for Covid-19: A Causal Model

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The worldwide pandemic caused by COVID-19, also known as SARS-CoV-2, has caused considerable disruption. Despite the government's attempts to manage the virus, there remains an ongoing increase in the number of cases, and is unclear how successfully people are following the prescribed policies, including being vaccinated. As of August 16, 2022, the DOH Dashboard reported that Region X, Philippines booster shot rate is very low of about 14.84 percent (DOH, 2022b). This study aimed to develop a causal model on adherence to the COVID-19 protocols. This study was anchored on the Theory of Health Belief Model, Health Behavior and Health, Social Cognitive Theory, Protection Motivation Theory, the Theory of Planned Behavior, and the Theory of Reasoned Action. This was conducted in a primary and secondary-level public medical facility utilizing the descriptive correlational and causal-comparative research designs to 302 participants. Clients exhibit high health-seeking behaviors, in terms of perceived susceptibility, perceived severity, perceived benefits, perceived self-efficacy, social stigma in labeling stereotype, knowledge about COVID-19, especially awareness, and adherence to COVID-19 protocols, in terms of preventive, regulatory measures, and vaccination but moderately high health seeking behavior in perceived barriers. moderately high knowledge on prevention and treatment and management, and moderately high level of social stigma among clients, in terms of separation and discrimination. There is a significant relationship between adherence to COVID-19 protocols and clients' health-seeking behavior, knowledge, and social stigma. Knowledge of COVID-19, in terms of awareness and prevention, alongside social stigma related to separation, significantly influence adherence to protocols. The best fit model is Causal Model 3 anchored on knowledge and social stigma known as Macabaya's Model on Adherence to COVID-19 Protocols.

Index Terms

Social Stigma, Adherence To Protocol, Knowledge, Health Seeking Behavior, Self-Efficacy

Design and Optimization of Eco-Friendly Solar-Powered Desalination Systems for Clean Water Access

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This research focuses on the design and optimization of environment-friendly solar-powered desalination systems that could potentially provide cleaner water access to water-scarce regions. This study focuses on enhancing the performance and efficiency of solar desalination by incorporating sustainable design principles and innovative technologies. The major driving forces affecting system performance (in terms of maximizing freshwater output, material selection, thermal efficiency and feed water system optimization) were extensively explored. A structural analysis of components is performed ensuring the best material is chosen and that it is stress resistant. Thermal modeling and performance analysis are performed to see the potential of improving the efficiency of the solar panel, which calculates a thermal efficiency of 14.69% with 834.62 watts of water output. It is calculated that the power usage for the desalination system is 18 amps over a 3-day period, and the frame displacement of the system, as well as the frame factor of safety, are determined as to be 0.708 mm and 6.014, respectively. It also shows that the purified water met three safety benchmarks; it had a pH of 6.8, proving that is safe to drink. This study highlights the promise of solar-powered desalination systems as a potentially viable, sustainable solution for access to clean water with major applications in regions with limited freshwater resources.

Index Terms

Solar Desalination, Optimization, Clean Water Access, Thermal Efficiency, Solar Energy, System Design, Water Purification, Bahrain, Sustainability

ICAKMPET

Comprehensive Cloud Solution for Secure Text Transmission: Enhancing Privacy and Integrity in Digital Communication

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Given the increasing risks to data integrity and privacy in the current digital world, it is imperative that text data be transmitted securely over cloud platforms. Although cloud computing provides a scalable and economical infrastructure, it also puts private data at risk from cyberattacks, illegal access, and data breaches. Through the use of cutting-edge encryption algorithms, secure authentication mechanisms, and data integrity verification methods, this article offers a comprehensive cloud solution intended to improve the privacy and integrity of digital communication. By using a multi-layered security strategy and end-to-end encryption, the solution reduces the possibility of illegal parties intercepting data whether it is in transit or at rest. A hybrid encryption paradigm is used to increase security, combining symmetric encryption for effective data protection with asymmetric encryption for key exchange. This guarantees that potential attackers cannot understand the data, even if it is intercepted. Furthermore, data integrity is preserved by the use of secure hashing methods, which enable recipients to confirm the accuracy and completeness of the information they have received. Role-based access control (RBAC) and multi-factor authentication (MFA), which limit access to authorized users and provide accountability, are complementary to this architecture. Because the suggested solution is cloud-agnostic, it may be deployed easily across different cloud providers while upholding uniform security standards. Performance tests show that there is little impact on latency, indicating that the method is viable for real-time applications. Additionally, the system is made to adhere to legal requirements like GDPR and HIPAA, which addresses privacy issues and boosts user confidence. This all-inclusive method of secure text transmission is appropriate for sectors with strict security requirements, such as government, healthcare, and finance, since it not only protects data but also strengthens the dependability and integrity of digital communications in a cloud environment.

Index Terms

Secure Text Transmission, Cloud Computing, Data Privacy, Encryption, Data Integrity, Hybrid Encryption, Multi-Factor Authentication, Role-Based Access Control, Regulatory Compliance, Digital Communication

Detecting the Unusual: A Novel Approach to Video Anomaly Detection Using Deep Learning and GANs

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The advent of deep learning has drastically altered video anomaly detection, resulting in the introduction of novel approaches. This research describes a unique video anomaly detection technique that uses future frame prediction via Generative Adversarial Networks (GANs) in conjunction with an attention mechanism. Our approach uses a modified U-Net architecture reinforced with an attention module for the generation model, while the discrimination model is built on a Markov GAN that adds self-attention, which improves the generator's output quality. We provide a novel strategy that uses the difference between anticipated future frames and actual frames to detect anomalous occurrences, making this the first time temporal constraints have been used with spatial restrictions in video prediction challenges. This dualfocus allows our model to successfully capture both spatial and temporal changes, resulting in higher detection accuracy. Extensive studies with several benchmark datasets show that our strategy beats current state-of-the-art procedures. Our findings show that integrating attention processes is critical for improving detection performance, with more complex applications producing better outcomes. This study not only enhances the present state of anomaly detection but also provides the framework for future research in this crucial sector.

Index Terms

Video Anomaly Detection; Future Frame Prediction; Generative Adversarial Network; Attention Mechanism; Temporal Constraints

Deep Learning-Enabled Word Construction for Enhanced Communication in Autism Spectrum Disorder

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This groundbreaking research introduces a novel language acquisition method designed to support Tamil-speaking children with Autism Spectrum Disorder (ASD). By addressing the critical need for specialized tools, this approach caters to an underserved population. Existing language learning apps often fall short in addressing specific linguistic challenges, focusing on general learning rather than the unique obstacles faced by ASD children. Our proposed method leverages Deep Learning (DL) modules to transform incomplete spoken Tamil words into a comprehensive, child-friendly vocabulary. This innovative approach extends beyond simple word completion by incorporating interactive features that engage children with ASD and foster active learning. Preliminary studies have yielded promising results, indicating the potential for improved communication skills among Tamil-speaking children with ASD. This study examines the limitations of traditional language learning tools and justifies the use of a DL-based approach. We provide an in-depth explanation of the system's unique DL architecture, including Recurrent Neural Networks, and its training using Tamil voice data. Furthermore, we explore the potential benefits beyond vocabulary learning, including enhanced sentence formulation and the development of pragmatic language skills. By bridging the language acquisition gap, this research offers Tamil-speaking children with ASD the opportunity to acquire critical communication skills and promote social inclusion.

Index Terms

Autism Spectrum Disease (ASD), Language Model, Natural Language Processing, Deep Learning Neural Network, Voice Bot Learning

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Faculty of Mechanical and Automotive Engg.; Principal Research, Automotive Engg. Centre, Universiti Malaysia Pahang Al Sultan Abdullah, Malaysia

Prof. **Ir. Dr. Mohd Sapuan Salit**
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Technical Product Manager Toyota Motor North America Plano, TX, United States

Dr. Ts. Vickneswari Durairajah
Deputy Dean, Faculty of Engineering, Built Environment, and Information Technology (FEBEIT), MAHSA University, Malaysia

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