

9th
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**COMPUTING &
INFORMATICS**

13-14 September 2023
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<https://soc.uum.edu.my/icoci/2023/>

PROGRAMME & ABSTRACT

Nurturing an Inclusive Digital Society for a Sustainable Nation

Organised by:
School of Computing, Universiti Utara Malaysia

Supporting Partners:

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FOREWORD BY ASSISTANT VICE CHANCELLOR



Welcome all esteemed guests to the **9th International Conference on Computing and Informatics (ICOCI 2023)** hosted by the School of Computing at UUM College of Arts and Sciences, Universiti Utara Malaysia.

This conference stands as a remarkable platform, bringing together participants from diverse corners of the world, eager to showcase their innovative research and ideas. Our theme for this year's conference, "**Nurturing an Inclusive Digital Society for a Sustainable Nation**," encapsulates the essence of our collective pursuit - leveraging the potential of technology to foster inclusivity and sustainability in our societies.

ICOCI2023 serves as a convergence point for brilliant minds from around the world, fostering the exchange of knowledge, collaboration, and exploration of groundbreaking ideas. The presentations, discussions, and interactions set to unfold over the next two days promise to be intellectually stimulating and inspiring, shaping the discourse on the challenges and opportunities of our digital age.

I extend my heartfelt gratitude to the organizing committee, distinguished speakers, session chairs, paper presenters, industry partners, sponsors and attendees for their invaluable contributions to this event. Your dedication and enthusiasm are the driving forces behind ICOCI2023's success.

May this conference foster deep insights, establish lasting connections, and ignite new directions in the ever-evolving realm of computing and informatics. Together, let's chart a course toward a future in which technology serves as a beacon for positive change, inclusivity, and sustainability.

Thank you for joining us on this journey of exploration, innovation, and advancement. Here's to a successful and enlightening ICOCI 2023.

Warm regards,

PROF. DR. OSMAN GHAZALI
ASSISTANT VICE CHANCELLOR
COLLEGE OF ARTS AND SCIENCES
UNIVERSITI UTARA MALAYSIA

FOREWORD BY ICOCI 2023 CHAIR



Dear distinguished guests, keynote speakers, and participants,

Welcome to ICOCI2023!

In the name of Allah, the Most Gracious, the Most Merciful, I extend my heartfelt thanks and gratitude for the immense blessings that have guided us to this remarkable moment.

This year's conference theme, "**Nurturing an inclusive digital society for a sustainable nation**," resonates deeply with the ever-evolving landscape of technology and its impact on our societies. We are gathering to explore how we can harness the power of digital innovation to create inclusive solutions that drive sustainability and foster unity and growth. Our commitment to this theme is a testament to our shared responsibility to shape the digital landscape for the betterment of our nations and our world.

Ladies and Gentlemen,

I am delighted to announce that this year's conference has received an overwhelming response, with 134 paper submissions from 14 countries. The dedication and enthusiasm displayed by authors from around the globe reflect the importance of the topics we are addressing. It is with great pride that we maintain a rigorous review process, resulting in an impressive acceptance rate of 40%. I extend my warmest congratulations and appreciation to all the authors and presenters for your valuable contributions to this intellectual discourse.

The journey of knowledge dissemination continues as the accepted and presented papers find their home in our esteemed publication venues. These works will enrich our understanding and pave the way for future research and innovations. Through this platform, we envision a ripple effect that extends beyond the conference, driving positive change in our societies.

I am pleased to introduce our esteemed keynote speakers for this conference, Prof. Dr. Alan Dix and Prof. Atreyi Kankanhalli. Their expertise and insights promise to

invigorate our discussions and inspire innovative approaches to our challenges in today's digital era.

As we convene at the exquisite Sama-sama Hotel in Kuala Lumpur, we not only embark on an intellectual journey but also have the opportunity to immerse ourselves in the vibrant culture of Malaysia's capital city. The enchanting blend of modernity and tradition provides the perfect backdrop for scholarly pursuits and personal enjoyment. I encourage all our esteemed guests to relish their stay in Kuala Lumpur.

I would like to express my sincere gratitude to all those who have played a pivotal role in making this conference a resounding success. I deeply appreciate the support given by distinguished keynote speakers, participants, industry partners and sponsors- your unwavering support has been invaluable. A special appreciation goes to the ICOCI2023 committee for their tireless efforts in orchestrating every aspect of this event.

In the spirit of collaboration and shared learning, I welcome you all to ICOCI2023. Let us seize this opportunity to cultivate ideas, forge connections, and shape the future of digital society for the sustainable advancement of our nations. May Allah bless our endeavours and guide us in our quest for knowledge and progress.

Thank you.

ASSOC. PROF. DR NORLIZA KATUK
CONFERENCE CHAIR
INTERNATIONAL CONFERENCE ON COMPUTING AND INFORMATICS 2023

BIOGRAPHY OF THE KEYNOTE SPEAKER



PROF. DR. ALAN DIX

Director of Computational Foundry
Swansea University, Wales

Prof. Alan started off as mathematician and later works on most things that connect people and computers. He is the Director of the Computational Foundry, and the mission of the Foundry very much matches his own personal goals, i.e. to do world-class research that makes a difference to real people. In Alan's own career this has included seminal work in human-computer interaction (HCI), including one of the core textbooks in the area, foundational work on formal methods and the user interface, and the earliest academic papers on mobile interfaces, on privacy and on gender and ethnic bias in machine learning. In 2013 he was elected as a member of the ACM SIGCHI Academy, one of the highest accolades for research in HCI. However, he has also been involved in a wide variety of practical commercial and non-commercial applications including agricultural spayers, submarine design, educational technology, intelligent internet interfaces, and technology for rural communities. His techniques are often eclectic, not least his one thousand mile walk around the perimeter of Wales that combined a technical investigation of technology at the margins, with more philosophical and artistic exploration. He has also written and taught academically and practically about technical creativity. He contributes occasional guest lectures on a number of topics and also create online materials as part of wider mission to the academic and practitioner community.

BIOGRAPHY OF THE KEYNOTE SPEAKER



PROF. DR ATREYI KANKANHALLI

Provost's Chair Professor
School of Computing, National University of Singapore

Prof. Atreyi is a Provost's Chair Professor in the Dept. of information Systems and Analytics, School of Computing at the National University of Singapore (NUS). She has served as Deputy Head (Research and Administration), Assistant Dean (Research) and Assistant Dean (Undergraduate studies) at the School of Computing. She was recognized in part for her many valuable contributions to research on online communities and digital collaboration. Her research identifies enablers and barriers to participation that is necessary to make these communities successful. Her research has been published in premium journals, and has been highly cited. Prof. Atreyi has won the AIS Fellow Award 2021, a prestigious award given by the Association for Information Systems (AIS) to academics in the Information Systems (IS) discipline who have made outstanding contributions to the IS discipline in terms of research, teaching and service, including significant global contributions, as well as local contributions in the context of their country and region.

CONFERENCE SCHEDULE

DAY 1 (13 th September 2023, Wednesday)		VENUE
0800	Registration	Gateway Foyer
0900	Parallel Session A1 Parallel Session A2	Gateway A Citation
1030	Refreshment	Gateway Foyer
1100	Parallel Session B1 Parallel Session B2	Gateway A Citation
1300	Luncheon	Continents Restaurant
1400	<p>Welcoming speech</p> <p>Assoc. Prof. Dr Norliza Katuk ICOCI 2023 Chair</p> <p>Opening Remarks</p> <p>Prof. Dr Osman Ghazali Assistant Vice Chancellor, College of Arts and Sciences Universiti Utara Malaysia</p> <p>Announcement of Best Paper Awards</p>	Gateway A
1500	<p>Keynote Address I</p> <p>Inclusivity and AI: Opportunity or Threat?</p> <p>Prof. Dr Alan Dix <i>Director of the Computational Foundry, Swansea University, Wales, UK</i></p>	Gateway A
1600	Parallel Session C1 Parallel Session C2	Gateway A Citation
1730	Refreshment	Gateway Foyer

Welcoming coffee break will be served at Gateway Foyer from 0830 to 0900.

DAY 2 (14th September 2023, Thursday)		
0900	Parallel Session D1 Parallel Session D2	Gateway A Citation
1030	Refreshment	Gateway Foyer
1100	Parallel Session E1 Parallel Session E2	Gateway A Citation
1200	<p>Keynote Address II</p> <p>Interaction between Humans and Conversational Agent: Research Opportunities and Future Directions</p> <p>Prof. Dr Atreyi Kankanhalli <i>Provost's Chair Professor of Department of Information Systems and Analytics, National University of Singapore, Singapore</i></p> <p>Lucky Draw</p>	Gateway A
1300	Luncheon	Continents Restaurant
1430	Parallel Session F1 Parallel Session F2	Gateway A Citation
1730	Refreshment & Closing	Gateway Foyer

Welcoming coffee break will be served at Gateway Foyer from 0830 to 0900.

PARALLEL SESSION SCHEDULE

DAY 1 (13 th September 2023, Wednesday)		
<i>Session A1</i>		<i>Gateway A</i>
Digital Healthcare & Well-being <i>Chair: Assoc. Prof. Dr Yuhanis Yusof</i>		
Time	PID	Title
0900	40	Air Quality Prediction using Support Vector Regression based on African Buffalo Optimization <i>Yuhanis Yusof & Inusa Sani Maijama'a</i>
0920	46	The Factors Influencing Blockchain Adoption in Hospitals: A Pilot Study <i>Mahmood A. Bazel, Mazida Ahmad, Fathey Mohammed, Nabil Hasan Al-Kumaim, Wasef Mater & Azman Yasin</i>
0940	63	Exploring the Relationship between Protection Motivation and Addiction Severity Towards Secure Intention Behaviour in Online Game Addiction among Adolescents <i>Wan Mohd Yusoff Wan Yaacob, Nur Haryani Zakaria & Zahurin Mat Aji</i>
1000	107	Designing and Developing M-Thyroid Care for Mobile Virtual Consultation <i>Ahmad Hanis Mohd Shabli, Noorulsadiqin Azbiya Yaacob & Noor Rafhati Adyani Abdullah</i>
<i>Session A2</i>		<i>Citation</i>
Ensuring Cybersecurity & Privacy <i>Chair: Prof. Dr Huda Ibrahim</i>		
Time	PID	Title
0900	2	Key Issues in Cybersecurity Implementation in Government Agencies: A Case Study in Jakarta Smart City <i>RG Guntur Alam, Huda Ibrahim & Ismail Rakip Karas</i>
0920	24	Data Archiving Model on Cloud for Video Surveillance Systems with Integrity Check <i>Norliza Katuk, Mohd Hasbullah Omar, Muhammad Syafiq Mohd Pozi & Ekaterina Chzhan</i>
0940	58	An Exploratory Study of Automated Anti-Phishing System <i>Mochamad Azkal Azkiya Aziz, Basheer Riskhan, Nur Haryani Zakaria & Mohamad Nazim Jambli</i>
1000	91	A Systematic Literature Review of Intrusion Detection System in Network Security <i>Guntoro & Mohd. Nizam Omar</i>
<i>Session B1</i>		<i>Gateway A</i>
Ensuring Cybersecurity & Privacy <i>Chair: Prof. Dr Osman Ghazali</i>		
Time	PID	Title
1100	80	Remote Public Data Auditing to Secure Cloud Storage <i>Osman Ghazali & Muhammad Farooq</i>
1120	84	A Systematic Literature Review of Ransomware Detection Methods and Tools for Mitigating Potential Attacks

		Mujeeb ur Rehman, Rehan Akbar, Mazni Omar & Abdul Rehman Gilal
1140	111	Penetration Testing Implementation using Smartphone: A Systematic Literature Review Eka Wahyu Aditya, Basheer Riskhan, Nur Haryani Zakaria, Fazli Azzali & Mohamad Nazim Jambli
1200	22	Large Scale Web Crawling and Distributed Search Engines: Techniques, Challenges, Current Trends, and Future Prospects Asadullah Al Galib, Md Humaion Kabir Mehedi, Ehsanur Rahman Rhythm & Annajiat Alim Rasel

Session B2

Citation

Digital Healthcare & Well-being
Chair: Assoc. Prof. Dr Nor Hazlyna Harun

Time	PID	Title
1100	86	CNN-Based Covid-19 Detection from Two Distinct Chest X-Ray Datasets: Leveraging TensorFlow and Keras for Novel Results Yaser Mohammed Al-Hamzi & Shamsul Sahibuddin
1120	93	Eye-Tracking Usability Data of BacaDisleksia for an Informed Dyslexia-Friendly Design Decision Husniza Husni, Nurul Ida Syaheera Mohd Nasri & Mohamed Ali Saip
1140	94	Hexa-Net Framework: A Fresh ADHD-specific Model for Identifying ADHD Based On Integrating Brain Atlases Dalia Al-Ubaidi, Azurah A Samah & Mahdi Jasim
1200	97	An Automated Enhancement System of Diabetic Retinopathy Fundus Image for Eye Care Facilities Nurul Atikah Mohd Sharif, Nor Hazlyna Harun, Nur Azmielia Muhammad Sharimi, Juhaida Abu Bakar, Hapini Awang & Zunaina Embong
1220	99	Persuading People to Fight Dengue, And Sustaining It, Via Mobile Application Masitah Ghazali, Nur Zuraifah Syazrah Othman, Zatul Alwani Shaffiei, Suriati Sadimon, Zuraini Ali Shah and Zuriahati Mohd Yunos
1240	106	Usability Study of UUM Student Portal Using Eye Tracker Nur Farah Amallina Azmi, Mohamed Ali Saip & Husniza Husni

Session C1

Gateway A

Digital Media & Information Literacy
Chair: Dr Hapini Awang

Time	PID	Title
1600	17	A Feature-Based Optimization Approach for Fake News Detection on Social Media using K-Means Clustering Farzana Kabir Ahmad, Siti Sakira Kamaruddin, Adnan Hussein Ali & Farah Lia Ibrahim
1620	36	Sentiment Analysis of Arabic Dialects: A Review Study Abdullah Habberrih & Mustafa Ali Abuzaraida
1640	45	Charting Inclusive Digital Society Research Trends: A Bibliometric Analysis of E-Participation through Social Media Hapini Awang, Nur Suhaili Mansor, Maslinda Mohd Nadzir, Osman Ghazali, Abderrahmane Benlahcene, Fadhilah Mat Yamin, Isyaku Uba Haruna, Shakiroh Khamis & Abdulrazak F. Shahatha Al-Mashhadani

1700	61	Open Issues in Agile Testing Environment for A Strong Digital Society Samera Obaid Barraood, Haslina Mohd, Fauziah Baharom & Shafinah Farvin Packeer Mohamed
1720	103	Estate Planning Model for Sustaining Economic Values of Digital Assets Norliza Katuk, Tey Peck Yong, Mohamad Sabri Sinal @ Zainal, Wan Aida Nadia Wan Abdullah, Norazlina Abd Wahab, Erik Kurniadi & Heru Budianto
<i>Session C2</i>		<i>Citation</i>
Education Transformation through Technology <i>Chair: Asmalinda Adnan</i>		
Time	PID	Title
1600	12	University Student Dashboard: Enhancing Student Trend Analysis and Decision-Making Processes Teh Soon Li, Mohamad Sabri Sinal@Zainal & Mazni Omar
1620	31	Fostering Cyber-Resilience in Higher Education: A Pilot Evaluation of a Malware Awareness Program for College Students Norliza Katuk, Nur A'fyfah Zaimy, Suren Krishnan, Raj Kumar KunhIRaman, Lee Hwee Hsiung & Derar Eleyan
1640	32	Analysis of the Effectiveness of Feedback Provision in Intelligent Tutoring Systems Nur Hafiza Jamaludin & Rohaida Romli
1700	78	Unlocking the Potential of Enhancing User Experience in Portal GREaT: Cultivating Great Ideas through Brainwriting Method Fauziah Baharom, Rohaida Romli, Wan Hussain Wan Ishak, Haslina Mohd, Yuhanis Yusof, Nur Haryani Zakaria, Mohamed Ali Saip, Osman Ghazali, Rahayu Ahmad, Mohd Hasbullah Omar, Suzilah Ismail & Juhaida Abu Bakar
1720	83	Current Practice in Implementing Learning Programming Techniques to Support Computational Thinking: Analysis of A Pilot Test Asmalinda Adnan & Rohaida Romli

DAY 2 (14th September 2023, Thursday)

Session D1

Gateway A

Navigating AI Development & Deployment *Chair: Wan En Ng*

Time	PID	Title
0900	23	A Video Summarization Method for Movie Trailer-Genre Classification based on Emotion Analysis <i>Wan En Ng, Muhammad Syafiq Mohd Pozi, Mohd Hasbullah Omar, Norliza Katuk & Abdul Rafiez Abdul Raziff</i>
0920	25	E-Nose: Spoiled Food Detection Embedded Device using Machine Learning for Food Safety Application <i>Wan Nur Fadhlina Syamimi Wan Azman, Ku Nurul Fazira Ku Azir & Adam Mohd Khairuddin</i>
0940	50	An Empirical Study of Label Size Effect on Classification Model Accuracy using a Derived Rule from the Holy Quran Verses <i>Ghaith Abdulsattar A. Jabbar Alkubaisi, Siti Sakira Kamaruddin & Husniza Husni</i>
1000	26	An Analysis of Objective Function Modification Approaches in Routing Protocols for Low Power and Lossy Networks: A Fuzzy Logic-Based Perspective <i>Laila Al-Qaisi-Suhaidi Hassan & Nur Haryani Zakaria</i>

Session D2

Citation

Navigating AI Development & Deployment *Chair: Shehu M. SarkinTud*

Time	PID	Title
0900	54	Anomalies in Mooring (Thin) Lines: Causes, Risk Mitigations, and Real-Time Consequences of Failure – A Comprehensive Review <i>Tarwan Kumar Khatri, Manzoor Ahmed Hashmani, Hasmi Taib, Nasir Abdullah & Lukman Ab. Rahim</i>
0920	66	Analysis of Lossless Compression in Huffman Coding and Lempel-Ziv-Welch (LZW) <i>Puteri Nurul'Ain Adil Md Sabri, Azizi Abas & Fazli Azzali</i>
0940	85	Data Analytics Modelling System for Short Courses at Seberang Jaya Community College <i>Zuriana Zamberi & Nur Intan Raihana Ruhaiyem</i>
1000	88	Examining the Software Developers' Perception in Open-Source Software of Blockchain Project using Association Rules Mining <i>Alawiyah Abd Wahab, Huda H. Ibrahim, Shehu M. SarkinTud & Bilyaminu Awwal Romo</i>
1020	96	Support Vector Machine for Satellite Images Classification using Radial Basis Function Kernel Method <i>Nur Suhaili Mansor, Hapini Awang, Sarkin Tud Shehu Malami, Amirulikhshan Zolkafli, Mohammed Ahmed Taiye & Hanhan Maulana</i>

*Session E1**Gateway A***Digital Media & Information Literacy**
Chair: Nurulhuda Ismail

Time	PID	Title
1100	77	A Test Dataset of Offensive Malay Language by a Cyberbullying Detection Model on Instagram using Support Vector Machine Nurulhuda Ismail, Davis Enrique Losada & Rahayu Ahmad
1120	92	Tik Tok Video Cluster Analysis based on Trending Topic Juhaida Abu Bakar, Azmielia Muhammad Sharimi, Mohd Azrul Edzwan Shahril, Nur Syafiqah Azmi, Nor Hazlyna Harun, Hapini Awang and Nur Syafiqah Abu Bakar
1140	74	Systematic Literature Review and Bibliometric Analysis on Addressing the Vanishing Gradient Issue in Deep Neural Networks for Text Data Shakirat Oluwatosin Haroon-Sulyman, Mohammed Ahmed Taiye, Siti Sakira Kamaruddin & Farzana Kabir Ahmad

*Session E2**Citation***Education Transformation through Technology**
Chair: Ahmad Hanis Mohd Shabli

Time	PID	Title
1100	109	The Effectiveness of Conducting STEM Projects using Design Thinking Approach in Rural Schools in Kedah, Malaysia: A Smart Farming Project Suwannit Chareen Chit Sop Chit, Ahmad Hanis Mohd Shabli & Massudi Mahmuddin
1120	110	Enhancing Supervisor Response Time: An Exploration of the Social Representation Theory of Shame in ELISTA Jefri Marzal, Edi Elisa, Pradita Eko Prasetyo Utomo & Suwannit Chareen Chit Sop Chit
1140	112	Early Detection of School Disengagement using MyBuddy Application Ahmad Hanis Mohd Shabli, Noraziah ChePa, Azizi Ab Aziz, Wan Hussain Wan Ishak & Laura Lim Sei-Yi

*Session F1**Gateway A***Digital Enterprise & Innovation**
Chair: Brandon Chua Choon Kit

Time	PID	Title
1430	7	E-commerce Carbon Footprint Contribution: A Preliminary Investigation Framework Siti Sakira Kamruddin, Farzana Kabir Ahmad, Alawiyah Abd Wahab, Zahurin Mat Aji & Noradila Nordin
1450	29	Designing an Expert System for Personal Financial Management Brandon Chua Choon Kit & Nor Farzana Abd Ghani
1510	62	Improving Rice Yield Prediction Accuracy using Regression Models with Climate Data Mohamad Farhan Mohamad Mohsin, Muhammad Khalifa Umana, Mohamad Ghozali Hassan, Kamal Imran Mohd Sharif, Mohd Azril smail, Khazainani Salleh, Suhaili Mohd Zahairi, Mimi Adilla Sarmani & Neil Gordon
1530	68	The Application of UTAUT Theory to Determine Trust among Women in E-hailing Apps Adoption Karrar Ali Abdullah & Musyrifah Mahmud

1550	79	Design and Development of Housing Interview Management System for Managing Housing Application Asvinitha Muniandy, Mazida Ahmad & Mohamad Adli Desa
1610	81	A Descriptive Study of Factors Influencing Online Purchasing Behaviour: Malaysian Consumer Perspective Nurul Ain Mustakim, Shuzlina Abdul-Rahman, Maslina Abdul Aziz & Zuhairah Hasan
1630	82	The Effects of Perceived Usefulness and Perceived Ease of Use On Intention to Use ICT Services among Agribusiness Practitioners in Somalia Husein Osman Abdullahi & Murni Mahmud
1650	64	Cross-layer based Intrusion Detection System for Wireless Sensor Networks: Challenges, Solutions and Future Directions Noradila Nordin
1710	98	Adoption of Machine Learning by Rural Farms: A Systematic Review Sayed Abdul Majid Gilani, Ansarullah Tantry, Soumaya Askri, Liza Gernal, Rommel Sergio & Leonardo Jose Mataruna-Dos-Santos

Session F2

Citation

Harnessing Technology for Sustainable Development
Chair: Dr Zhamri Che Ani

Time	PID	Title
1430	28	A Regression Test Case Prioritization Framework for Software Sustainability Bakr Ba-Quttayyan, Haslina Mohd & Yuhanis Yusof
1450	44	Towards A Sustainable Digital Society: Supporting Producer Mobility in Named Data Networking through Immobile Anchor-Based Mechanism Ahmad Abrar, Khuzairi Mohd Zaini, Ahmad Suki Che Mohamed Arif & Mohd Hasbullah Omar
1510	59	Enabling A Sustainable and Inclusive Digital Future with Proactive Producer Mobility Management Mechanism in Named Data Networking Nurul Hidayah Ahmad Zukri, Ahmad Suki Che Mohamed Arif, Mohammed Gamal AlSamman & Ahmad Abrar
1530	69	Integrating Blockchain Consensus Mechanism to Enhance Trust and Security in Named Data Networking for Sustainable Digital Society Athirah Rosli, Suhaidi Hassan & Mohd Hasbullah Omar
1550	72	The Recent Trends of Research On GitHub Copilot: A Systematic Review Zhamri Che Ani, Zauridah Abdul Hamid & Nur Nazifa Zhamri
1610	108	Blockchain over Named Data Networking Architecture: A Review Mohammed AlSamman, Suhaidi Hassan, Fathey Mohammed & Yousef Fazea
1630	113	A Review of Policy on Creative Industry for Sustainable Nation: A Malaysian Perspective Syamsul Bahrin Zaibon, Asmidah Alwi, Ahmad Hisham Zainal Abidin, Adzrool Idzwan Ismail, Nur Kareelawati Abd Karim & Shamsul Arrieya Ariffin
1650	43	Blockchain-based Supply Chain for A Sustainable Digital Society: Security Challenges and Proposed Approach Norshakinah Md Nasir, Khuzairi Mohd Zaini, Suhaidi Hassan & Noradila Nordin

ABSTRACT

PID02

Key Issues in Cybersecurity Implementation in Government Agencies: A Case Study in Jakarta Smart City

RG Guntur Alam¹, Huda Ibrahim² and Ismail Rakip Karas³

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Information Security Governance has become one of the main focus areas of government management because of its importance in protecting the overall information assets of government organizations. The Cybersecurity Governance Framework that is applied in the government environment should ideally follow the flow of government management and bureaucracy. Government management and bureaucracy directives are usually interpreted, disseminated, and implemented through a series of policies related to cybersecurity. Policies should ideally be implemented from the policy-making level to the operational level, where they are eventually being implemented. Implementing cybersecurity will involve many stakeholders which are regulated by rules and regulations. This study reports on follow-up and interviews of key actors/informants in Jakarta Smart City (JSC). Initial experience shows that the implementation of cyber security in JSC must follow the flow of the prevailing government bureaucracy. Three factors were involved in implementing bureaucracy-based cybersecurity: Legal Fundamental for Cybersecurity Management, Security Management, and Cybersecurity Stakeholders.

Keywords: Information Security, Security management, Security Framework, Security Bureaucracy

PID07

E-commerce Carbon Footprint Contribution: A Preliminary Investigation Framework

Siti Sakira Kamruddin¹, Farzana Kabir Ahmad², Alawiyah Abd Wahab³, Zahurin Mat Aji⁴ and Noradila Nordin⁵

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The growth of e-commerce has brought about a growing concern regarding its impact on the environment. Activities such as excessive packaging, delivery, and returns have contributed to increased carbon emissions, resulting in a significant carbon footprint. To promote a sustainable e-commerce environment, a study is needed to assess the carbon footprint contribution of online businesses. This paper presents a framework for conducting a preliminary investigation into the carbon production and emissions of identified e-commerce organizations. The framework was formulated by analyzing the relevant literature from similar studies. It comprises a 3-phase research activity: Phase 1 involves identifying carbon footprint factors through a literature search; Phase 2 includes conducting a case study on an online business to construct a carbon consumption profile; and Phase 3 involves developing a measurement method to assess the carbon consumption of online businesses. The proposed framework can provide a preliminary understanding of e-commerce's carbon footprint contribution and enable authorities to assess the level of carbon consumption and devise action plans to reduce its impact on the environment. However, challenges and implications are associated with implementing the framework, which is discussed in the paper.

Keywords: Carbon Footprint, Preliminary Investigation Framework, E-commerce, Carbon Consumption Profile.

PID12

University Student Dashboard: Enhancing Student Trend Analysis and Decision-Making Processes

Teh Soon Li¹, Mohamad Sabri bin Sinal@Zainal² and Mazni Omar³

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In today's data-driven era, organizations are constantly seeking ways to improve their decision-making processes, and dashboards have emerged as an effective solution for this purpose. Dashboards provide a real-time visual representation of an organization's critical data, metrics, and performance indicators, allowing decision-makers to quickly comprehend key insights and make informed decisions. Universities are increasingly adopting dashboards to facilitate data-driven decision-making, allowing administrators to identify areas of strength and weakness in various academic and administrative functions. The objective of this study is to propose a holistic dashboard model for universities that includes critical aspects of student data on campus implemented in a higher education institution in Malaysia. The model will provide extensive student data segments that can be monitored and supported regularly, providing the top management with a broader perspective on the student's condition on campus. To assess the efficacy of the proposed dashboard model, the Datus model, a comprehensive framework that aids organizations in designing and implementing efficient dashboards in terms of accessibility, appropriate recognisability, effectiveness, efficiency, learnability, operability, satisfaction and user interface aesthetic, will be utilized. The results indicate that the user interface design received a favorable response, while the usability evaluation revealed that operability, appropriate recognizability, and accessibility were areas that require improvement.

Keywords: University Dashboard, Business Intelligence, Usability Evaluation.

PID17

A Feature-Based Optimization Approach for Fake News Detection on social media Using K-Means Clustering

Farzana Kabir Ahmad¹, Siti Sakira Kamaruddin², Adnan Hussein Ali³, and Farah Lia Ibrahim⁴

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The social networks and news ecosystem provide valuable social information, however, the rise of deceptive content such as fake news generated by social media users, poses an increasing threat to the propagation and diffusion of fake news over the social network and among users. Low-quality news and misinformation spread on social media had negative impacts on individuals and society. Hence, it is essential to detect fake news to ensure the spread of accurate and truthful information. To address this problem, a new approach using Binary Bat Algorithm (BBA) for fake news detection (FND) on Twitter data is proposed in this paper. Twitter data usually generates massive feature space which might consist of irrelevant features that could jeopardize the subsequent process. The proposed FND approach involves four stages, namely data collection, pre-processing, feature extraction, and fake news detection. The proposed techniques are tested on PHEME dataset, and the experimental results are measured in term average of Precision (PR), Recall (R), F-measure (F), and Accuracy (ACC). The experimental results show that the BBA algorithm has outperformed the Social Spider Optimization (SSO) algorithm. Thus, BBA is a promising solution for solving high-dimensionality feature space in fake news Twitter data.

Keywords: Fake news detection, Binary Bat Algorithm, Social Spider Optimization, Feature Selection, Text Mining.

PID22

Large Scale Web Crawling and Distributed Search Engines: Techniques, Challenges, Current Trends, and Future Prospects

Asadullah Al Galib¹, Md Humaion Kabir Mehedi, Ehsanur Rahman Rhythm, and Annajiat Alim Rasel

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The heart of any substantial search engine is a crawler. A crawler is a program that collects web pages by following links from one web page to the next. Due to our complete dependence on search engines for finding information and insights into every aspect of human endeavors, from finding cat videos to the deep mysteries of the universe, we tend to overlook the enormous complexities of today's search engines powered by the web crawlers to index and aggregate everything found on the internet. The sheer scale and technological innovation that enabled the vast body of knowledge on the internet to be indexed and easily accessible upon queries is constantly evolving. In this paper, we look at the current state of the massive apparatus of crawling the internet, specifically focusing on deep web crawling, given the explosion of information behind an interface that cannot be extracted from raw text. We also explore distributed search engines and the way forward for finding information in the age of large language models like ChatGPT or Bard. Our primary goal is to explore the junction of large-scale web crawling and search engines in an integrative approach to identify the emerging challenges and scopes in massive data where recent advancements in AI upend traditional means of information retrieval. Finally, we present the design of a new asynchronous crawler that can extract information from any domain into a structured format.

Keywords: Web Crawling, Crawler, Distributed Systems, Search Engines, Deep Web Crawling, Large Language Models, Asynchronous Crawler.

PID23

A Video Summarization Method for Movie Trailer-Genre Classification Based on Emotion Analysis

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We live in an information world where visual data undergo exponential growth within a very short time window. With diverging content diversity, we simply have no capacity to keep track of those data. While short video platforms (such as TikTok™ or YouTube Shorts™) can help users viewing relevant videos within the shortest time possible, those videos might have misleading information, primarily if it is derived from long videos. Here, we analyzed several short videos (in terms of movie trailers) from YouTube and established a correlation between one movie trailer and the classified movie genre based on the emotion found in the trailer. This paper contributes to (1) an efficient framework to process the movie trailer and (2) a correlation analysis between the movie trailer and movie genre. We found that every movie genre can be represented by two unique emotions.

Keywords: movie analytic, face detection, emotion recognition, video summarization.

PID24

Data Archiving Model on Cloud for Video Surveillance Systems with Integrity Check

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Video data has grown significantly as a result of the expanding usage of high-resolution cameras and longer retention periods, necessitating effective archiving solutions, such as video surveillance systems, that make data easy to retrieve and maintain data integrity. These systems are relied upon by businesses and private users to protect their assets and guarantee that video recordings are properly archived for later use. In order to solve the issues of data storage, integrity, and retrieval in surveillance systems, this study proposes a data archiving model with an integrity check for video surveillance systems saved on the cloud. The suggested model has four parts: system architecture, data archiving method, data integrity check, and data schema. These components enable metadata production, effective cloud storage, AI-based human identification, and data security. The model's critical elements are developed, tested, and evaluated in this study to guarantee its dependability and efficiency when managing video surveillance data. Coding the archiving module, testing the software with a pertinent dataset, and creating the integrity check module are all included in the scope. The integrity check module's performance was tested by comparing compromised and uncompromised data to see how well the model could distinguish between real data and data that had been tampered with. The findings imply that the suggested methodology successfully addresses the problems associated with archiving video surveillance data, improving security, resource management, and data protection. Additionally, it promotes the creation of reliable, tamper-resistant surveillance systems, creating a more dependable digital video surveillance landscape.

Keywords: Data archiving, data retrieval, integrity, security, surveillance systems

PID25

E-Nose: Spoiled Food Detection Embedded Device Using Machine Learning for Food Safety Application

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This research aims to employ machine learning (ML) to classify the degree of contamination in leftover cooked foods based on their smell. This study evaluates the odour characteristics of typical leftover cooked lunch or dinner meals that are consumed locally in Malaysia. An easy-to-use e-nose application was attached to the food containers, consisting of four different types of sensors sensitive to various gases, to collect the data. RStudio is used to analyze samples in order to identify the odour classification of leftover Malaysian food. The accuracy ranged from 90 % to 100% when using the oversampling and undersampling techniques. The results of this re-search showed satisfactory performances by Support Vector Machines (SVM) is superior compared to that of k-Nearest Neighbours (k-NN) in classifying the samples' contamination degree. As a result, the findings showed that the electronic nose used in this study was a promising method for classifying the degree of contamination in leftover cooked foods and predicting whether food is still edible or not.

Keywords: classification, machine learning, food waste.

PID26

An Analysis of Objective Function Modification Approaches in Routing Protocols For Low Power And Lossy Networks: A Fuzzy Logic-Based Perspective

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The routing protocol known as RPL is employed in low power and lossy networks. It makes use of an objective function (OF) to establish a Destination Oriented Directed Acyclic Graph (DODAG) and ascertain the most suitable parental candidate or trip route. Nevertheless, the task of identifying a suitable OF in Low Power and Lossy Networks (LLN) is a significant challenge. The RPL was intentionally designed to possess a high degree of flexibility, allowing for the construction of routing topologies without imposing any specific routing metric or constraint. This design choice was made to accommodate the diverse range of LLN that exist. This study provides a critical overview of recent literature pertaining to the topic of RPL and specifically focuses on the many strategies aimed at enhancing OF inside the RPL protocol. The objective of this study is to provide an analysis of relevant endeavors, including the development of innovative metrics and the application of fuzzy logic techniques in the combination of OF metrics. Furthermore, this paper discusses the recommended augmentation strategies, as well as constraints and future development directions. The research community can employ the findings to gain a deeper comprehension of objective functions and improve the performance of RPL in the face of security problems.

Keywords: RPL, OF enhancement, IoT, RPL performance, Fuzzy Logic

PID28

A Regression Test Case Prioritization Framework for Software Sustainability

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In software development, test cases are stored for later use, such as retesting or regression testing. Optimization is one of the approaches used in regression testing, particularly test case prioritization (TCP). TCP aims to rapidly uncover defects during software development. Existing TCP methods lack reliability and suffer from efficiency and effectiveness due to insufficient evaluation, reproducibility, and benchmarking. Currently, no existing TCP framework is integrated with the hybrid PSO-ABC optimization method. This paper aims to introduce a TCP framework that includes five factors, namely fault detection and severity, test case dependency, clustered test cases, and test input, which are used to prioritize test cases. The process starts by determining three factors from the literature (i.e., fault detection and severity, as well as clustered test cases) and contributing the other two (i.e., test case dependency and test input) to seek better optimization. Historical data from previous runs regarding these TCP factors were extracted and stored for analysis. The proposed TCP framework was verified by ten experts, and it was learned that this framework received positive feedback. TCP is closely related to the longevity of software since it can ensure that systems remain reliable, dependable, and maintainable over time. By identifying and prioritizing essential test cases, developers can focus their testing efforts on the areas of the system that are most likely to be affected by changes.

Keywords: Test Case Prioritization, Swarm Intelligence, Multi-objective optimization

PID29

Designing an Expert System for Personal Financial Management

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The significance of financial planning in individuals' lives cannot be understated. People are transitioning from traditionally paper-based or tangible methods of tracking their finances to more digital-based approaches. However, recent studies indicate that the study on personal financial management systems is limited, and the traditional software did not meet the users' needs. The current software lacks the ability to offer practical recommendations to users and direct them towards achieving their financial objectives. This study aims to design a personal financial management software that implements artificial intelligence techniques. A rule-based expert system technique was adopted to provide practical recommendations and support users in achieving their financial goals. Besides that, a prototype of the proposed system will be developed and evaluated by domain experts using a user perception survey. The results reveal that the respondents are satisfied with the design of the proposed system. The outcome of this study could provide practical recommendations that users can use to make informed financial decisions and accomplish their financial objectives.

Keywords: Personal Financial Planning, Artificial Intelligence, Expert System.

PID31

Fostering Cyber-Resilience in Higher Education: A Pilot Evaluation of a Malware Awareness Program for College Students

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This study evaluated the effectiveness of a malware awareness program designed to enhance college students' knowledge of malware prevention strategies and promote responsible online behaviour. The program group discussions and presentations are designed to address misconceptions and improve students' understanding of malware prevention, including identifying security attacks, understanding malware spreading mechanisms, and avoiding risky online behaviour. A study was conducted following the pre-test and post-test assessments to measure the program's impact on students' knowledge levels. The results revealed significant improvements in post-test scores indicating the program's success in achieving its objectives. The observed enhancements in students' knowledge can be attributed to the program's focus on delivery techniques, which have been proven effective in enhancing knowledge retention and promoting learning. The implications of this study underscore the value of providing targeted and engaging cybersecurity education to college students. By incorporating malware awareness programs into the educational system, institutions can foster a more secure digital environment and promote a culture of cyber-resilience among future professionals. Furthermore, the program's success suggests that similar interventions may be beneficial in other areas of cybersecurity, encouraging ongoing research and development of educational initiatives that address the diverse range of threats in today's interconnected world.

Keywords: Security, cybersecurity awareness, malware attacks, prevention, higher education

PID32

Analysis of the Effectiveness of Feedback Provision in Intelligent Tutoring Systems

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The effectiveness of feedback provision in an Intelligent Tutoring System (ITS) is a crucial aspect to be considered when developing a tutoring system. The system is proven beneficial if it can act like a one-to-one human tutor, which provides feedback based on student learning aptitude and performance. Many researchers have developed ITSs with the intention of assisting students in teaching programming concepts, algorithms, and writing computer programmes. However, there have been very few studies that have focused on reviewing these works. The studies are merely concerned with reviewing the characteristic, application, evaluation and supplementary features of ITSs across different educational fields from 2007 until 2017. As a result, a comparative evaluation was conducted with the goal of analysing the feedback provided by existing works in ITSs as well as the techniques used to develop a student model. The results of this study have indicated that Constraint-Based modeling, Model Tracing, Natural Language processing, and Deep Learning with delayed feedback are the most appropriate feedback for students learning to code. Bayesian Network is the most commonly used technique by researchers with immediate and delayed feedback to help students learn programming concepts and algorithms better.

Keywords: Intelligent Tutoring System (ITS), Feedback and Hints provision, Modeling Technique

PID36

Sentiment Analysis of Arabic Dialects: A Review Study

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Arabic people use Arabic dialects on social media platforms to express their opinions and connect. Due to the absence of standard rules or grammar, Arabic dialects are more challenging for NLP tools to analyze than standard Arabic. While most review studies in this field have focused on highly indexed databases such as Scopus, Web of Science, and IEEE, these databases are not accessible to many Arabic researchers in Arabic countries due to financial constraints. This review study explores recent research and studies published in different databases to address this gap. The study identifies the most common sentiment analysis approaches, preprocessing and feature extraction techniques, and classification and evaluation techniques used in this field. The authors found that Twitter is the most commonly utilized source for researchers to collect their datasets, and machine learning approaches are the most commonly used for sentiment analysis in Arabic dialects. Overall, this study provides valuable insights into the challenges and opportunities for sentiment analysis in Arabic dialects.

Keywords: Sentiment Analysis, Arabic Language, Arabic Dialects, Machine Learning, Classification.

PID40

Air Quality Index Prediction using Support Vector Regression based on African Buffalo Optimization

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Support Vector Regression (SVR) is one of the machine learning models widely used in regression analysis. As an alternative for fitting a line to the data points like typical linear regression algorithms, it finds a hyperplane that is effective in fitting data points in a continuous space. The kernel type and hyperparameters significantly influence the performance and effectiveness of SVR. Determination of the optimal values is crucial in ensuring the success of prediction, regardless of the application domain. This study adapts the African Buffalo Optimization (ABO) algorithm to determine SVR's regularization and kernel parameters. The ABO algorithm mirrors African buffaloes' hunting and defensive behavior, offering ability to track the best position and extensive memory capacity to discover the best solution for problems under analysis. Evaluation is then performed on the air quality index benchmark dataset, and the prediction results of SVR-ABO are compared against other optimized SVR prediction models. The results show that SVR-ABO is a better algorithm because it produces smaller errors and best fits the data. Such an outcome indicates that the proposed SVR optimized by ABO is a competitive prediction model in data analytics.

Keywords: Support Vector Regression, African Buffalo Optimization, sustainable environment

PID43

Blockchain-based Supply Chain for a Sustainable Digital Society: Security Challenges and Proposed Approach

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Blockchain technology is a distributed digital ledger in a decentralized network that offers immutability, security, and transparency in various applications among digital societies. The consensus mechanism is the defining technology behind the security and performance of the Blockchain system. Under the Industrial Revolution 4.0, blockchain has been considered for integration into supply chain business as an innovative solution to tackle the challenges of traceability, transparency, lack of trust, and data counterfeiting in digital supply chain management. A private permissioned Blockchain is the most suitable type of Blockchain for Supply Chain Management (SCM) as it promises better performance with high throughput and low latency. However, private Blockchains that use the Byzantine Fault Tolerance (BFT) consensus mechanism have low-security capabilities and are more vulnerable to cyber-attacks triggered by malicious nodes. In this paper, we outline the research challenges from the security aspect towards the integration of Blockchain with SCM. Then we design an approach for a private Blockchain-based Supply Chain with security capabilities by proposing an enhancement consensus model to the BFT consensus mechanism for identifying and terminating malicious nodes in the consensus process. The performance of the proposed approach will be validated experimentally and compared it against Practical Byzantine Fault Tolerance (PBFT). The proposed approach is expected to prevent security attacks on the consensus mechanism, thereby improving the security and performance of the Blockchain system.

Keywords: Distributed ledger, Consensus algorithm, Byzantine fault tolerance.

PID44

Towards a Sustainable Digital Society: Supporting Producer Mobility in Named Data Networking through Immobile Anchor-Based Mechanism

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The increasing proliferation of intelligent mobile devices and the subsequent surge in data traffic have placed a burden on the current Internet infrastructure. To address this challenge, Data Networking (NDN) has emerged as a promising future Internet architecture. NDN aims to address the evolving patterns of Internet traffic by providing inherent support for consumer mobility through in-

network caching. This approach enhances content availability while minimizing delays. However, producer mobility in NDN raises numerous challenges, including Interest packet loss, Interest retransmission, high signalling costs, and unnecessary bandwidth consumption. This research explores and critically analyses the most widely used approaches for managing producer mobility in NDN. This paper introduces an innovative immobile anchor-based mobility mechanism designed to address the challenges associated with producer mobility in NDN. The immobile refers to the fixed nature of the anchor router, which is strategically placed within the network topology to facilitate the management of producer mobility. This immobile anchor router serves as a centralized control point for caching and redirecting Interest packets during producer handoff processes, thereby mitigating packet loss and optimizing bandwidth usage. The focal point of this novel approach is to reduce the repercussions of producer mobility on network performance. Its aim is to minimize factors like packet loss, signalling overhead, and bandwidth usage, with the ultimate goal of enhancing the overall efficiency of NDN-based networks.

Keywords: Handoff, Mobility Management, Producer Mobility, Information-centric networking, Named data networking.

PID45

Charting Inclusive Digital Society Research Trends: A Bibliometric Analysis of E-Participation Through Social Media

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This study analyzed 287 articles on e-participation within social media, which were retrieved from the Scopus online databases as of 11 December 2022. The aim was to identify crucial areas and significant contributors within the field and recent research trends. The findings indicate that the trend of e-participation was slow to start, with researchers primarily from Western nations. The field still struggles to establish itself as an independent area of research, and identity-related issues are prevalent. In addition, the subject of e-participation through social media has received limited attention in the literature, with a focus on politicians' groups and minimal consideration of government-driven initiatives. This study is among the first to analyze bibliometric trends in e-participation literature related to social media. It is revealed that the publication trends on e-participation did not portray any consistent increment over the years, although the adoption of ICT in public sectors is happening at a peak rate. The findings can guide future research in this area and underscore the importance of considering government-driven initiatives in e-participation research, as they play a critical role in shaping digital democracy. Nonetheless, it is essential to interpret these findings deliberately, as the dataset solely covers the Scopus database and may not comprehensively cover all available sources. Finally, the study serves as a basis for future investigations in the field of e-participation and social media.

Keywords: E-Participation, Digital Society, Social Media, Digital Solutions.

PID46

The Factors Influencing Blockchain Adoption in Hospitals: A Pilot Study

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Blockchain technology has gained popularity as a secure and efficient data storage and sharing method, with potential benefits for patient data management, cost reduction, and data security in the healthcare sector. However, the adoption rate of blockchain in healthcare organizations is significantly low. This pilot study aims to verify the validity and reliability of the instrument developed to determine the factors that may be impacting the adoption of blockchain technology by Malaysian hospitals. A small sample of decision-makers in Malaysian hospitals was targeted to collect the preliminary data using an online survey instrument developed based on the Technology-Organizational-Environment (TOE) framework and related studies constructs' items. The data was analyzed using Partial least squares structural equation modeling (PLS-SEM). The findings confirmed the reliability and validity of the measurement scales. This study contributes to ongoing research on BCT adoption in healthcare organizations and offers insights that can be useful to practitioners and researchers in this field.

Keywords: Blockchain adoption, Healthcare, Malaysia

PID50

An Empirical Study of Label Size Effect on Classification Model Accuracy Using a Derived Rule from the Holy Quran Verses

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Machine Learning (ML) has become more and more significant in various applications, such as sentiment analysis and topic modelling, due to its ability to handle large volumes of text data and achieve high accuracy. Thus, the accuracy of the classification model using sentiment analysis has gained important heed recently because of its potential to provide valuable insights into customer preferences and public opinions. Accuracy is largely dependent on the quality and quantity of labelled data. This study aims to manifest the impact of label size on classification model accuracy by applying a derived rule from the Holy Quran verses which focuses on the useability of binary classification with two labels and comparing the accuracy models trained on a dataset labelled based on that rule and three-labelled dataset. The results show that the accuracy of the models trained on the binary-labelled dataset was higher than the accuracy of the models trained on the three-labelled dataset. The study's findings will have implications for future research in ML models by applying the observed semantics from Quranic exegesis and analysis to improve the performance of ML models.

Keywords: Machine Learning, Sentiment Analysis, Classification Accuracy.

PID54

Anomalies in Mooring (Thin) Lines: Causes, Risk Mitigations, and Real Time Consequences of Failure – A Comprehensive Review

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Mooring (Thin) lines are fabricated of polyester ropes, steel wire ropes, and chains. These are considered the essential components which are used to secure offshore marine vessels and floating facilities by keeping them in a fixed place and resisting external loads. However, the failure of any mooring lines because of anomalies can cause severe consequences including financial losses, loss of life, and harm to the environment. Thus, it is essential to determine the anomalies in mooring lines beforehand to ascertain reliable and safe offshore mooring operations. This paper furnishes a comprehensive review of various types of anomalies in mooring lines with their underlying causes, and risk mitigation tactics. Furthermore, the types of mooring lines including polyester ropes, chain, and steel wire ropes have been discussed with their advantages and disadvantages. Additionally, the real-time consequences of failure in mooring lines are explored which occur due to the anomalies in the mooring lines including but not limited to environmental damage, vessel drift, and collision. In order to reduce the risks associated with mooring line anomalies, this review concludes by summarizing the major findings and emphasizing the significance of proactive monitoring and maintenance.

Keywords: Anomalies in Mooring Lines, Mooring Systems, Mooring (Thin) Line Failure.

PID58

An Exploratory Study of Automated Anti-Phishing System

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Phishing attacks have emerged as a major problem in the digital world due to a rising trend in their frequency. While various approaches have been developed to detect and prevent phishing attacks, a definitive solution to the problem has yet to be discovered. This study discusses automated anti-phishing systems while analyzing and comparing various anti-phishing strategies using exploratory research. Traditional, machine learning, and deep learning-based anti-phishing systems are discussed in the article. The study highlights the use of Artificial Intelligence (AI) based systems, particularly utilizing methods such as Convolutional Neural Networks, Support Vector Machines, and Recurrent Neural Networks. These AI-based approaches dominate the current trend in the field. This study could potentially be helpful for researchers who wish to delve deeper into the topic of automated phishing detection and prevention systems with a comprehensive review. It is advised to carry out further research to investigate the strengths and limitations of different methods and algorithms used in automated anti-phishing systems to understand their performance and effectiveness better.

Keywords: Phishing, Anti-Phishing, Machine Learning, Deep Learning

PID59

Enabling a Sustainable and Inclusive Digital Future with Proactive Producer Mobility Management Mechanism in Named Data Networking

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Named Data Networking (NDN) is the most remarkable initiative of Information-Centric Network (ICN) to improve overall network performance. With its data-centric architecture and forwarding philosophy, NDN natively addressed consumer mobility. However, the producer mobility problem remains a challenging issue in NDN architecture. Among the critical issues of producer mobility are handover latency, Interest packet loss, and Interest retransmission. This paper classifies existing producer mobility solutions into rendezvous, anchor-based, and anchor-less approaches. Despite the efforts of many researchers poured into solving these issues, there is still room for improvement. This paper proposes a producer mobility management mechanism based on a proactive approach to managing producer mobility in NDN. The proposed mechanism proactively evaluates the handover time of the producer and sends the mobility notification packet to inform about the producer's movement. In the

meantime, a new Interest packet for the moving producer will be buffered on the router. Thus, the proposed mechanism aims to reduce the handover latency and packet loss.

Keywords: Named Data Networking, Producer Mobility, Consumer Mobility.

PID61

Open Issues in Agile Testing Environment for A Strong Digital Society

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The testing process is very important, amplified to clarify a quality product due to continuous changes in software requirements in the agile development environment. It is imperative to highlight the high-quality generation of the test cases because a test case is a significant part of the testing process. Hereafter, the testing process had better be sufficiently planned, and evaluating test case quality (TCQ) can support the description of some important issues related to software testing. Nonetheless, the review of the literature and the serious investigation of empirical studies exposed that no more academic research has examined the TCQ in an agile environment. Consequently, this paper is aimed to identify the problems of TCQ in the agile environment by reviewing the existing work concerning testing quality. Literature survey is used to identify the issues of TCQ. This paper has provided a valuable contribution by explaining and clarifying the limitations of TCQ and highlighting the characteristics that enhance it in agile projects. In this paper the critical issues of testing quality in agile were covered and suggested solutions were discussed.

Keywords: Agile Software Testing, Test Case Issues, Test Case Quality.

PID62

Improving Rice Yield Prediction Accuracy using Regression Models with Climate Data

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Rice production is critical to food security, and accurate yield predictions are required for planning and decision-making. However, precisely predicting rice yields using machine learning models can be difficult due to the complicated interactions of various factors, such as how climate affects production of rice. This study sought to solve this rice production is critical to food security, and accurate yield predictions are required for planning and decision-making. However, precisely predicting rice yields using machine learning models can be difficult due to the complicated interactions of various factors, such as how climate affects rice production. This study aims to address this issue by investigating how Malaysian rice yield prediction models are affected by climate data. The study utilized linear regression model trained on rice production data and compared their performance with models that incorporated climate data. Both datasets covered the period from 2010 to 2021 in Malaysia. The study found that including climate data significantly improved the prediction accuracy, with an approximately 77% improvement in MAE and 69% improvement in RMSE. The results suggest that incorporating climate data into yield prediction models is essential for accurate and reliable predictions. These findings have important implications for stakeholders in the agricultural industry who can use accurate yield predictions to make informed decisions. However,

the study's limitations include the use of a single predictive model and data from a single country, suggesting the need for future studies to explore other machine learning algorithms and expand the scope of the research to other regions. Overall, this study contributes to the growing body of literature on the impact of climate data on yield prediction models and highlights the importance of considering climate data in agricultural decision-making.

Keywords: Rice production, Climate data, Machine learning, Crop yield prediction, Linear regression

PID63

Exploring the Relationship Between Protection Motivation and Addiction Severity Towards Secure Intention Behavior in Online Game Addiction Among Adolescents

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Online game addiction refers to the excessive and compulsive use of online games, leading to negative consequences in various aspects of people's life. One concerning aspect is that compulsive players may compromise their security and safety while engaging in gaming activities. Despite the growing concern about this issue, there is still much to understand about providing effective protections and interventions, particularly among adolescents. Thus, this paper aims to investigate the relationship between protection motivation and the severity of online game addiction, with a particular focus on secure intention behavior among adolescents affected by online game addiction. A survey was conducted involving 660 late adolescents (aged 17-19 years) from various Higher Learning Institutions (HLIs) in Peninsular Malaysia. The findings revealed that 35% of the participants were addicted to online games, as assessed by the Online Cognition Scale (OCS) and Online Game Addiction Scale (OGAS). The severity of online game addiction significantly impacted secure intention behavior within the online gaming environment. Additionally, protection motivation emerged as a significant predictor of positive security behavior. These results offer new insights and support the existing hypotheses, emphasizing the importance of investigating the impact of online game addiction severity on secure intention behavior. Understanding the relationship between protection motivation and the severity of online game addiction concerning security intention behavior is crucial to prevent adverse outcomes, such as insecure cyber behavior and vulnerability to cyber threats. The findings from this study can contribute to the development of effective interventions and prevention strategies against cyber threats in the context of online gaming.

Keywords: Protection Motivation, Addiction Severity, Online Game Addiction and Secure Intention Behavior.

PID64

Cross-layer based Intrusion Detection System for Wireless Sensor Networks: Challenges, Solutions, and Future Directions

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Wireless Sensor Networks (WSNs) consist of numerous affordable, energy-efficient, compact wireless sensors. These sensors are designed to collect, process, and communicate data from their surrounding environment. Several energy-efficient protocols have been created specifically for WSNs to optimize data transfer rates and prolong network lifespan. Multi-channel protocols in WSN are one of the ways to optimize efficiency and enable seamless communication between nodes, thereby reducing interference and minimizing packet loss through multiple channels. Despite their numerous advantages in data sensing and monitoring, various attacks can pose a threat to a WSN. There are several types of attacks that a WSN may encounter, including spoofing, eavesdropping, jamming, sinkhole attacks, wormhole attacks, black hole attacks, Sybil attacks, and DoS attacks. One of the strategies for enhancing security in WSNs is implementing a cross-layer intrusion detection system (IDS) that can detect initial indicators of attacks that target vulnerabilities across multiple WSN layers. This paper reviews the existing IDS at each layer and the challenges in an energy-efficient cross-layer IDS for WSN in terms of the attacks and IDS approaches.

Keywords: Cross-layer IDS, Wireless Sensor Network, Multi-channel protocol.

PID66

Analysis of lossless compression in Huffman Coding and Lempel-Ziv-Welch (LZW)

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Quick Response codes (QR codes) are widely used as a two-dimensional barcode to store information such as website URLs, contact information, and product details. They have become increasingly popular as a means of sharing information due to their ability to store large amounts of data in a small space. However, as the amount of data stored in QR codes increases, so does the size of the code required to hold it. Huffman Coding is a statistical data compression technique that reduces the code length used to represent alphabetic symbols. This is a common method for generating Minimum-Redundancy Codes. LZW is a frequently used dictionary-based compression algorithm.

Keywords: Data compression, Lossless Compression, QR Code, Huffman Coding, Lempel-Ziv-Welch (LZW).

PID68

The Application of UTAUT Theory to Determine Trust among Women in E-Hailing Apps Adoption

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The gig economy has paved the way for sharing economy growth especially e-hailing applications, as more women turn to e-hailing applications for convenience in commuting and travelling. However, women are concerned about whether to trust or not to trust e-hailing applications due to the openness of their digital and spatial crowdsourcing nature. Additionally, the user's locations are exposed to risks like stalking, identity theft, and physical safety, which can be extremely dangerous, especially for women. The paper begins by introducing the e-hailing industry and the gig economy. It then discusses women's unique challenges in using e-hailing applications and their trust towards these platforms. This paper dives deep into the heart of the matter by employing a quantitative approach through the survey to investigate women's trust in e-hailing apps using the UTAUT as the underpinning theory. The results show that e-hailing applications greatly influence women's trust while puzzlingly having no significant impact on their trust towards e-hailing drivers. From eye-opening insights to practical recommendations, this study sheds light on the crucial role of trust in the sustainable growth of the e-hailing industry focusing on women.

Keywords: Gig economy, E-hailing, Trust, Risk, UTAUT, women in sharing economy

PID69

Integrating Blockchain Consensus Mechanism to Enhance Trust and Security in Named Data Networking for Sustainable Digital Society

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Named Data Networking (NDN) is expected to be the successor to the current host-based Internet. NDN includes a variety of improvements to network communication involving built-in multicast, in-network caching, multipath forwarding, and direct data security. Despite these overwhelming offers, NDN is exposed to several attacks include content poisoning attacks from intruder especially the

publisher that have been stolen the credentials. The current NDN network also depends on the signature and matching names to authenticate the data packet that comes from the producer. Following this issue, this paper presents an integrated trust-based consensus mechanism that will authenticate the publisher identity before the data send by them being stored in cache memory on NDN network. The proposed mechanism is adapted from the Blockchain consensus mechanism that will ensure trust being distributed among the consortium networks of NDN. In addition, to ensure trust and agreement are achieved by the network, the mechanism is run to gather voting from other consortium members based on the attributes of the nodes. This paper is expected to give an overview of how Blockchain technology can be integrated with NDN network in order to create trust in the network.

Keywords: Blockchain technology, Named Data Networking, authentication mechanism, trust mechanism, future trust technology.

PID72

The Recent Trends of Research on GitHub Copilot: A Systematic Review

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GitHub Copilot is an AI-powered code generation tool developed by OpenAI and GitHub that has gained significant attention from the software engineering community. Despite the significant attention received from the software engineering community, there is a lack of comprehensive examination of its effectiveness, reliability, and ethical implications on GitHub Copilot. The absence of a systematic review of GitHub Copilot's recent research trends hinders a thorough understanding of its current state of development and potential impact on software development practices. Therefore, this systematic review aims to analyze the recent trends of research on GitHub Copilot to assess its current state of development, identify gaps in existing knowledge, and provide insights into potential future research directions. This study used PRISMA for searching the relevant databases, screening and selecting eligible studies based on inclusion and exclusion criteria, data extraction and synthesis, and critical appraisal of the quality and relevance of the studies included. The results show that the trend of the studies is focusing on four main areas: developer productivity, code quality, code security and education.

Keywords: GitHub Copilot, Code Generation, OpenAI

PID74

Systematic Literature Review and Bibliometric Analysis on Addressing the Vanishing Gradient Issue in Deep Neural Networks for Text Data

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The feature to learn complex text representations enabled by Deep Neural Networks (DNNs) has revolutionized Natural Language Processing and several other fields. However, DNNs have not developed beyond all challenges. For instance, the vanishing gradient problem remains a major challenge. This challenge hinders the ability of the system to capture long-term dependencies in text data. This challenge limits the ability to understand context, implied meanings, semantics, and to represent intricate patterns in text. This study aims to address the prevalent vanishing gradient problem encountered in DNNs when dealing with text data. Text data's inherent sparsity and heterogeneity exacerbate this issue, increasing computational complexities and processing time. To tackle this problem comprehensively, we will explore existing literature and conduct a bibliometric analysis to identify potential solutions. The findings will contribute to a comprehensive review of the existing literature and suggest effective strategies for mitigating the vanishing gradient problem in the context of NLP tasks. Ultimately, our study will pave the way for further advancements in this area of research.

Keywords: Vanishing gradient, Text data, Natural Language Processing · Deep Neural Network.

PID77

A Test Dataset of Offensive Malay Language by a Cyberbullying Detection Model on Instagram Using Support Vector Machine

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Social media services have become a prevalent communication tool due to their capability to instantly share information with a large number of people for free. However, social media also facilitate cyberbullying, and studies have shown that cyberbullying on social media has a severe impact compared to other platforms. In some cases, cyberbullying provokes tragic problems, such as suicide. The information shared on social media services provides a massive amount of textual data, which can be used to explore patterns of human behaviors including cyberbullying. This paper aims to build a dataset of offensive language for research on cyberbullying in the Malay language through a series of baseline experiments by implementing SVM classifiers. These preliminary experiments helped to understand the performance of automatic tools that mine for abusive language within a corpus of Malay texts. To achieve the objectives, social media extraction methods and new crawling technologies oriented have been developed to monitor the Instagram accounts of popular Malaysian celebrities. The resulting collection contains 165,239 real-world comments associated with 27 Instagram public accounts. A sample of this corpus was manually labelled in terms of cyberbullying categories. After the dataset was cleaned, normalized, and vectorized, this led to a collection of 527 comments. Following a standard training (70%) and test (30%) split, the SVM classifier was developed and evaluated. These initial experiments produced a model accuracy of 75% and f1-scores of around 75%.

Keywords: Support Vector Machines, supervised machine learning, Instagram, cyberbullying, Malay language.

PID78

Unlocking the Potential of Enhancing User Experience in Portal GREaT: Cultivating Great Ideas Through Brainwriting Method

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Portal GREaT serves as a one stop center developed by the Ministry of Education Malaysia (MoHE) to provide Malaysian graduates with information on career opportunities, career advancement, upscaling and rescaling programs. It consists of various modules designed to cater to specific needs of different users, including graduates, industries, and MoHE. However, the functionalities of Portal GREaT are continuously expanding based on user requests. These circumstances are deemed as improper planning in software development, and the extension of modules has resulted in an unstructured interface design for the application. To address these issues, prioritizing user experience (UX) in the application design is crucial. A well-designed UX can effectively guide users through the application and help them achieve their goals efficiently. One effective approach to enhancing UX design is by utilizing the Brainwriting method. Consequently, we conducted a workshop with 24 participants, consisting of web developers and designers, to improve the UX design of Portal GREaT by using the Brainwriting method. Brainwriting is a group creativity technique that encourages individual ideation and collaborative refinement. By employing this technique, developers and designers can generate diverse and innovative ideas to enhance the application's UX. Ultimately, this can lead to a more intuitive and user-friendly interface, thereby improving user satisfaction and the overall success of the

application. The outcomes of the Brainwriting workshops are a list of innovative ideas to improve the portal. One of the innovative idea is chosen to applied in the portal. Consequently, the new design of the Portal Great is launched. In conclusion, any web applications that continuously expand in its functionalities needs to prioritize the UX in the software development plans. The Brainwriting method serves as an effective tool to cultivate innovative UX ideas and enhance the overall user experience of the application.

Keywords: Web application design, Brainwriting method, User experience, Portal GREaT

PID79

Design and Development of Housing Interview Management System for Managing Housing Application

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The housing department in Wisma Darul Aman plays an important role in planning, coordinating, and developing housing schemes for low-income Malaysians. However, the manual process of recording and storing applicant information on paper is time-consuming for the staff, and retrieving applicant information can be challenging. Thus, the main objective of this study is to design and develop the Housing Interview Management System (HIMS) for the housing department. The system manages applicant information, enabling storage, retrieval, modification, and deletion, while generating scores based on their responses, offering a more accurate and efficient solution for the Wisma Darul Aman housing department. To design and develop the system, Prototyping Software Development Methodology was used, which consists of identifying the requirements through interview sessions with housing department staff, designing the system, building the prototype using PHP and JavaScript, conducting user evaluation among housing department staff, refining prototype, and implementing and maintaining the system. The findings of the evaluation show that the system is useful and easy to use. Most respondents expressed high satisfaction with the system, indicating that the system worked as desired and effectively facilitated the housing interview process. The study highlights the significant potential of the HIMS to streamline the housing department's interview process, contributing to improved affordable housing delivery for low-income Malaysians.

Keywords: Interview Management System; Prototyping; Housing Department; Program Perumahan Rakyat (PPR); Low income

PID80

Remote Public Data Auditing to Secure Cloud Storage

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Cloud computing is a pay-as-you-go business model that offers elastic remote data storage, and computing resources have become necessary due to the emergence of big data. After data outsourcing to the cloud, cloud users lose control over data; and are always concerned about data privacy and security in adopting the cloud service model. So, to ensure remote data integrity, a trusted auditor is allowed to make auditing tasks according to the users' request, which is helpful to release auditing overheads on a user device and meaningfully improve the scalability of cloud services. Although numerous data auditing techniques have been designed with TPA so far, these techniques suffer data security and efficiency issues. First, these techniques cannot authenticate block indices, so the server can produce valid proof without an original data block to pass the audit process. Second, existing approaches do not include position fields, so the server can replace the tampered data block with a healthy one to pass the audit phase. To overcome these issues, this paper introduces a new public data authentication scheme named ERPDA. The proposed technique incorporated a newly designed Merkle Tree (MT) based structure, named Sequence and Position-based Tree (SPT), that minimizes computation complexity to find nodes in data audit and avoid data replacement attacks. The experimental outputs showed that our suggested technique is effective with the comparative data auditing techniques in computation overheads and the security is proved under the random model.

Keywords: Cloud Computing, Third-party Auditing, Proof of Data Possession.

PID81

A Descriptive Study of Factors Influencing Online Purchasing Behavior: Malaysian Consumer Perspective

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Understanding the influence factors on online purchasing behavior from a Malaysian consumer perspective is crucial for businesses and marketers aiming to thrive in the digital marketplace. This study aims to investigate the factors that influence online purchasing behavior among Malaysian consumers. It gives detailed insights into how the factors affect consumer behavior. The questionnaire was adopted in accordance with previous research, and data were collected using a survey method. Approximately 560 respondents' data were collected through convenience sampling, with the criteria of being Malaysian, above 18 years old, and having used an e-commerce platform at least once. Descriptive statistics, correlation coefficients, and multiple regression analyses were conducted, and the findings showed that attitude, psychology, product price, privacy, perceived benefits, and accessibility were significant factors in online purchase behavior. Meanwhile, perceived risk was found to be significant but negatively affects online purchase behavior. The results revealed that online consumers' purchase behavior is not influenced by trust and security, hedonic motivation, emotional and promotional factors. However, the findings should be further explored by delving deeper into specific factors and exploring emerging trends, such as social commerce or live stream, to be more generalizable. This is the first study to measure the eleven influencing factors on online purchasing behavior comprehensively.

Keywords: Online Purchasing Behavior, Malaysian Consumer, Attitude, Hedonic Motivation, Perceived Risk.

PID82

The Effects of Perceived Usefulness and Perceived Ease of Use on Intention to Use ICT Services among Agribusiness Practitioners in Somalia

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ICTs have the potential to increase efficiency, productivity, and overall performance in the agribusiness sector. However, the utilization of ICT among agribusiness practitioners in Somalia is not well-understood. This study investigates the effects of perceived usefulness (PU) as well as perceived ease of use (PEOU) on the intention to use (ITU) information and communication technology (ICT) services among agribusiness practitioners, including farmers, producers, growers, managers and agribusiness owners in Somali agribusiness industries. The Technology Acceptance Model (TAM) was utilized to evaluate the two crucial components of the use of ICT in agribusiness. A set of questionnaires has been developed for data collection from employees of agribusiness companies. A hundred and three (103) employees have responded, the data has been analyzed with descriptive statistics and Multiple Linear Regression (MLR) analysis was applied to test the hypotheses. The finding highlights that PU and PEOU highly correlated with the ITU ICT services among agribusiness practitioners in Somalia. This indicates a positive effect of PU and PEOU toward using ICT services. The study recommends that agribusiness companies provide ICT training and skills for their employees to continuously improve their operations and services. The research sheds light on the potential utilization of ICT services in Somalia's agribusiness sector, which can contribute to the productivity and performance of their agriculture industry.

Keywords: Perceived Usefulness, Perceived Ease of Use, ICT Services, Agri-business, TAM.

PID83

Current Practice in Implementing Learning Programming Techniques to Support Computational Thinking: Analysis of A Pilot Test

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Learning programming is the most challenging aspect to teach and learn. Teaching and learning programming are now experiencing a change in the ecosystem and techniques used following the conversion of technology. The challenges educators and students face due to these changes necessitate a tailored response. Thus, a preliminary study will be carried out to assess current practices in implementing learning programming techniques (s) in an introductory programming course among secondary and tertiary education students. A questionnaire was constructed for the preliminary study. In addition, a pilot test aims to identify potential problem areas and deficiencies in the research instruments and protocol before implementation during the entire study. This paper focuses on revealing the analysis and results of the conducted pilot test. Using a strata random sampling, it was conducted among 10 educators and 30 certificate, diploma, and degree students. The instrument used is a questionnaire comprising five (5) constructs and 78 and 77 items for students and educators, respectively. The result shows that the questionnaire is valid and reliable and is expected to be used for data collection for the preliminary study.

Keywords: Pilot study, teaching and learning programming techniques, computational thinking.

PID84

A Systematic Literature Review of Ransomware Detection Methods and Tools for Mitigating Potential Attacks

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In today's world, cybersecurity is critical in the field of information technology. With the rise of cyber-attacks, including ransomware attacks, protecting user data has become a top priority. Despite the various strategies employed by governments and companies to counteract cybercrime, ransomware continues to be a major concern. Therefore, there is a need to detect and obfuscate viruses in a better way. This immutable impact on the target is what recognizes ransomware attacks from traditional malware. Ransomware attacks are expected to become more problematic in the future. Attackers might use new encryption methods or obfuscation techniques to make ransomware detection and analysis a difficult job. To protect against such attacks, organizations and users employ various tools, guidelines, security guards, and best practices. However, despite these efforts, cyber-attacks have increased exponentially in recent years. Among the most devastating of these attacks is ransomware, which can encrypt user files or lock their devices' interfaces, rendering them unusable. This research paper provides a valuable resource for researchers, practitioners, and policymakers seeking to enhance their understanding of ransomware detection and mitigation. It also examines defense tactics, such as system backups and network breakdowns, which can help mitigate the impact of an attack. Finally, the paper considers upcoming challenges in the field of cybersecurity and the importance of staying vigilant in protecting against cyber threats.

Keywords: Cyberattack, Cybersecurity, Ransomware detection, Ransomware mitigation

PID85

Data Analytics Modelling System for Short Courses at Seberang Jaya Community College

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Community College adhered to the Ministry of Higher Education is well known for its lifelong learning prospects and distinctively offers a short course about the community surrounding the institute. To date, the primary focus in the academic and industrial realms is on descriptive and predictive analytics. Nevertheless, prescriptive analytics, which seeks to find the best course of action for the future, has increasingly garnered research interest. Meanwhile, the analysis will be used to implement actionable plans to help in decision-making that can benefit the institution as well as the officers concerned. This paper investigates the problem arising by using analytical methods in elevating short course enrolment in Seberang Jaya Community College. Upon completion with the usage of Market Basket Analysis (MBA) techniques integrating the descriptive and predictive analysis, results obtained are established thoroughly with specific details that were to attain cluster insights based on the participant's interest that leads to non-mainstream courses related to the college credential-expertise program. Course modelling proposal for participants' enrolment through MBA that leads to output produced for Lift Parameter, uses specific rules that have higher lift and confidence that participants tend to join *Kursus Penyelenggaraan Komputer* (consequents) when they joined *Kursus Rangkaian Komputer* (Antecedents). In looking at the association rules, it seems that both these courses are highly considered to be enrolled.

Keywords: Community College, Data Analytics, Lifelong Learning, Short Courses.

PID86

CNN-Based Covid-19 Detection from Two Distinct Chest X-Ray Datasets: Leveraging TensorFlow and Keras for Novel Results

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The Covid-19 pandemic has profoundly influenced global health and daily life across numerous countries, necessitating the urgent implementation of effective diagnostic strategies. This underscores the importance of advancing accurate, efficient, and rapid early detection techniques. In this context, convolutional neural networks (CNNs) have demonstrated remarkable proficiency in image recognition and classification tasks, particularly when applied to large annotated datasets. However, the domain of medical image classification presents significant challenges primarily stemming from the scarcity of annotated medical images such as chest X-rays images. Therefore, this study presents a new deep learning model for Covid-19 diagnosis from chest X-rays. Two distinct chest X-ray datasets from different sources are utilized for model training and testing. The proposed CNN-based model accurately calculates chest X-rays into positive and negative categories, providing an automated and efficient approach to diagnosing viral disease. This work holds significant importance for pandemic control and a safer future.

Keywords: Covid-19 Detection, Chest X-Ray, Convolutional Neural Networks (CNNs)

PID88

Examining the Software Developers' Perception in Open-Source Software of Blockchain Project Using Association Rules Mining

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Developers are vital in enhancing blockchain projects like Bitcoin through feature additions, bug fixes, and performance optimization. However, comprehending developers' perception of the growing amount of information regarding new features and bug fixes becomes challenging as blockchain projects gain popularity. Data mining, a technique that extracts valuable patterns and information

from extensive data sets, assists in decision-making. The Apriori algorithm, widely used in data mining, uncovers association rules among sets of items. Despite its effectiveness, the Apriori algorithm remains relatively underutilized in the field of Open Source Software (OSS) developer turnover. Previous studies have employed approaches like mining software project repositories, social network analysis, quantitative data analysis, and surveys, which shed light on turnover but fail to reveal interesting relationships and patterns related to subjective factors and collaboration. To address this gap, this paper proposes combining survey data with association rule mining. This approach aims to identify co-occurrence patterns between specific personal and project-related variables (e.g., intention to learn or system integration). By analyzing these variables and their associations, the paper intends to provide valuable insights to project leaders, aiding decision-making in developer turnover management. Ultimately, this research contributes to enhancing the quality of blockchain projects.

Keywords: Developer's Turnover, Perception Patterns, Intention to Learn.

PID91

A Systematic Literature Review of Intrusion Detection System in Network Security

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In the rapidly evolving information technology landscape, network attacks are becoming more sophisticated and pose significant threats. Intrusion Detection Systems (IDS) have emerged as crucial tools for mitigating network security risks. Despite the vast amount of research on IDS methods, there still remains a gap in comprehensive literature reviews that cover recent developments in techniques, datasets, and tools. This study conducted a comprehensive systematic literature review to address this gap, analyzing 67 selected articles. The review covered various aspects, including IDS research domains, techniques/methods, datasets, and simulators. By synthesizing the findings, the study provides valuable insights into the current state of IDS research and identifies future challenges and unexplored areas. This review sheds light on the strengths and limitations of existing IDS techniques and datasets, offering researchers and practitioners a holistic understanding of the field. The identified research gaps and unexplored topics will guide future research endeavors, leading to advancements in IDS techniques and bolstering network security.

Keywords: Intrusion Detection System, IDS, Network Security, Systematic Literature Review

PID92

TikTok Video Cluster Analysis based on Trending Topic

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TikTok is a popular social networking application that offers trend research and is a valuable source for users. However, this is often misconstrued for content, which may not be suitable for children due to inappropriate content. This study aims to improve user perception of TikTok by using topic modelling and clustering techniques to identify trending topics in TikTok videos. The research uses Latent Dirichlet Allocation (LDA) and K-means clustering techniques to enhance the recognition of local and global topics across text documents. The methodology includes data collection, data pre-processing, clustering, topic modelling, and results. Ten subjects associated with trending TikTok videos are displayed using the LDA algorithm, and the generated topics are used to produce an Inter-topic Distance Map. The method's effectiveness is evaluated using log-likelihood score and perplexity

measurements. It has a log-likelihood score of 5579 and a perplexity score of 287. A good model is one with a higher log-likelihood and lower perplexity. The study extracts popular TikTok topics using both the LDA topic modelling technique and the K-means clustering algorithm.

Keywords: Social Networking Application, Topic Modelling, Clustering Analysis, Latent Dirichlet Allocation, TikTok.

PID93

Eye-Tracking Usability Data of BacaDisleksia for an Informed Dyslexia-Friendly Design Decision

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BacaDisleksia is an application specifically designed for children with dyslexia learning to read. The application aims to facilitate dyslexic children and ease their reading by carefully considering the Human-Computer Interaction and Interaction Design fundamentals that could facilitate them to read better. However, the design of BacaDisleksia is yet to be empirically confirmed. Therefore, a usability testing was conducted using Tobii eye-tracker to further examine its design. Six dyslexic children as participants were involved in the testing revealing design issues related to BacaDisleksia that can be improved based on eye-tracking data such as heat maps and gaze plots. As a results, this paper presents the eye-tracking usability findings that could inform dyslexia-friendlier design decisions for any application with a similar aim as BacaDisleksia. Such design decisions are crucial in digital innovation to provide better digital solutions for dyslexia and other learners with reading difficulties, in line with one of UNESCO's aims for having the technology to support inclusivity for children with disabilities, including learning disabilities such as dyslexia.

Keywords: Eye-tracking usability, human-computer interaction, interaction design, dyslexia.

PID94

Hexa-Net Framework: A Fresh ADHD-specific Model for Identifying ADHD Based on Integrating Brain Atlases

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Attention Deficit Hyperactivity Disorder (ADHD) is a frequent neurodevelopmental disorder affecting children and adults, which is routinely diagnosed based on subjective observations and behavioural assessments. Recent advancements in neuroimaging, particularly in resting-state functional magnetic resonance imaging (rs-fMRI), have provided a better understanding of the functional brain network impairments linked to ADHD. The human brain naturally consists of resting-state networks (RSNs) that are spatially distinct and functionally homogenous. Therefore, identifying ADHD biomarkers using the human brain's RSNs is a promising approach. In order to make accurate statistical inferences in brain science, it is necessary to utilize brain atlases for localizing network-of-interest (NoIs). However, locating the spatial components of these RSNs using human brain functional atlases poses challenges due to a lack of disease-specific atlases and atlases concordance issues. This research (1) conducts a study and addresses six RSNs that are frequently referenced in ADHD literature: (Auditory-, Cognitive Control-, Dorsal Attention-, Default Mode-, Sensorimotor-, and Ventral Attention-) Networks (2) Introduces a framework that attempts to enhance the generation of ADHD-specific brain reference, named "Hexa-Net"; This comprehensive approach may improve the reliability and applicability of ADHD studies to a fresh level via segregating and integrating the brain into (NoIs) by evaluating predetermined brain atlases. We hypothesize that the Hexa-Net Model can offer a more precise and unbiased method for identifying ADHD-related impairments. As a result, this framework serves as a practical guide for analyzing biomarkers from rs-fMRI scans to aid in diagnosing ADHD.

Keywords: ADHD identification Framework, Brain Networks Analysis, Functional Brain atlases, Resting-state networks, Hexa-Net Model.

PID96

Support Vector Machine for Satellite Images Classification Using Radial Basis Function Kernel Method

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Machine learning, particularly Support Vector Machines (SVM), has gained popularity in geospatial data processing and image classification. Geospatial data from various sources may contain errors, impacting image classification accuracy. Traditional pixel-based and object-based methods struggle to classify complex land cover classes accurately. Previous studies explored machine learning algorithms like Random Forests, K-Nearest Neighbours, and Neural Networks. Still, they faced challenges capturing intricate relationships within images and required substantial labeled training data, leading to computational expenses. SVM with polynomial kernels was attempted in some studies, but it suffered from potential overfitting and inefficiency for large datasets. To overcome these issues, this study employed SVM with RBF and Linear kernels to classify multispectral satellite images from the SPOT-6 Satellite Imagery dataset in Sungai Kelang, Malaysia. Previous research evaluated each kernel's performance accuracy compared using a test dataset, utilizing open-source tools like Jupyter Notebooks and Python libraries to explore SVM's potential as a high-performance satellite image classification technique. The findings revealed that SVM with RBF kernel outperformed SVM with polynomial or linear kernels in classifying satellite images. The RBF kernel's robustness allowed SVM to model intricate decision boundaries and capture complex patterns in the image data, making it suitable for tasks with non-linearly separable data. The study introduces a new methodology and theoretical contribution to image classification-related literature, shedding light on the efficacy of SVM-RBF for geospatial data processing. It provides an alternative to traditional approaches for complex image classification tasks. Moreover, the research assists in selecting the optimal algorithm for remote sensing and satellite imagery applications.

Keywords: Support Vector Machine, Geospatial, Image Classification, Radial basis function (RBF) Kernel, Linear Kernel.

PID97

An Automated Enhancement System of Diabetic Retinopathy Fundus Image for Eye Care Facilities

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Examining retinal fundus images is compulsory for ophthalmologists to spot features of eye diseases. Some problems, including low contrast and blurred retinal fundus image, may seriously affect the diagnostic procedure, leading to misdiagnosis. Low quality of retinal fundus image makes recognition of features for Diabetic Retinopathy (DR) to be harder for the ophthalmologist. Moreover, there is a lack of eye care facilities infrastructure with ophthalmologists to serve multi-morbid DR patients in rural areas, specifically Malaysia. Hence, this research proposed the development of an automated

enhancement system based on computer vision and the Artificial Intelligence (AI) field to improve the quality of fundus images captured. The DR Enhancement System (DRES) helps ophthalmologists in the screening aspect by improving the detection of aberrant fundus images. Several methods for improving the fundus image are utilized: Retinex, Contrast Limited Adaptive Histogram Equalization (CLAHE), and Low-light enhancement. Results show that all methods performed better when improving low-contrast and blurred images. This study contributes to the screening process of DR by improving the quality of the retinal fundus image. The developed AI-based system can also help to solve healthcare logistics problems of reaching DR patients in rural areas.

Keywords: Contrast Enhancement, Retinal Fundus Image, Diabetic Retinopathy, CLAHE, Low-light enhancement

PID98

Adoption of Machine Learning by Rural Farms: A Systematic Review

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Machine Learning (ML) has seen a major increase as a method to improve operations for businesses and consumers in different industries. It has been highlighted to enhance efficiency for businesses in product creation, product development, marketing, and customer experience. The purpose of this paper was to review worldwide studies investigating ML adoption by rural businesses to determine the level of ML adoption research conducted in the context of rural farms. A systematic literature review incorporating a Template Analysis (T.A.) was conducted to determine the level of research investigating drivers and barriers to ML adoption by rural enterprises. The reviewed studies were selected based on research purpose (investigating the take-up of innovations/technology by rural businesses), year of research (2000-2023), and inclusion of rural businesses in the studies. Additionally, the reviewed studies were analysed based on the year of each study, the geography of the study, the sector, and the size of businesses, including the level of location/rurality of included businesses and the degree of technology/innovation adoption by enterprises. The findings from the study highlight a research problem based on limited research investigating the adoption of ML by rural farms in several regions around the world. Additionally, the findings from the review highlight a lack of clarity on the relationship between the sector and the size of businesses and their adoption of ML. The significance of the highlighted findings is that there is scope for further research investigating the adoption of ML by smaller rural businesses, which may inform their survival and growth and may have wider implications for policymakers and practice. Therefore, encouraging future primary research focusing on ML adoption by rural farms in the regions under-represented in the literature. Additionally, the findings from this paper have policy, practical, and theoretical implications.

Keywords: Machine Learning, Rural Enterprises, Adoption, Drivers, and Barriers.

PID99

Persuading People to Fight Dengue, and Sustaining it, via Mobile Application

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The challenge to dengue prevention lies in sustaining the preventive activity among the community, which commonly only takes place periodically, i.e. when they are dengue outbreaks, with the presence of health officers under the Communication for Behavioural Impact (COMBI) campaign. In this paper, a mobile application is specifically developed based on COMBI Behavioural Change model which focuses on persuading users to new habit and sustaining it. The application was carefully designed to reflect the stages of behavioural change. Combining both quantitative and qualitative approaches,

an experiment was performed over a four-week study with eight participants, and based on the empirical findings, it is found that with careful design, users can be persuaded to take up the new habit. Two traits that are deemed important are, understanding the 'why', and the trait of being responsible citizens. In addition, at the end of the study, users felt comfortable continuing with the cleaning activities without the application. Thus, more thoughts should be considered for the application to still be relevant in the sustainable phase.

Keywords: Dengue Prevention, Persuasive Technology, Behavioural Change.

PID103

Estate Planning Model for Sustaining Economic Values of Digital Assets

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The rapid growth of computer technology has led to the invention of digital assets containing financial values like cryptocurrency and e-wallets, consequently increasing individuals' digital asset ownership. However, many people do not realise the importance of estate planning for their digital assets. In the case of sudden death, unavailable estate planning would cause the digital assets to vanish due to unavailable access to the digital assets' credentials. Therefore, digital asset owners must have proper estate planning to allow smooth inheritance of their digital assets before an individual's death, ensuring that their family is being taken care of. Besides, digital estate planning is also crucial to preventing cybercrimes such as identity theft and fraud. Hence, this paper bridges the gap by developing an estate planning software model to sustain digital assets containing economic values. The software model was developed by gathering the requirements for digital asset estate planning and visualising it in a prototype. Then, an evaluation was conducted on the prototype that visualised the proposed model. The results suggested that it is usable and facilitates digital asset estate planning. The significant contribution of this research is that the prototype enhances the security of one's digital assets by giving access to a trusted person. It is also simple and cost-effective for digital asset owners by providing independent services for estate planning.

Keywords: digital assets, cryptocurrency, estate planning, sustainability, online systems

PID106

Usability Study of UUM Student Portal using Eye Tracker

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Universiti Utara Malaysia (UUM) Student Portal is a comprehensive platform dedicated to UUM students. This one-stop portal facilitates our community's access to learning, academic, and administration information. This study is performed to evaluate the usability of the portal by using an eye-tracker involving 15 participants (9 males and 6 females) who were third-year students from the School of Computing (SOC). During the Usability Test session at UUM Computer Lab, participants were given six specific tasks to perform. The study analysed heat maps and gaze plots to identify the correlation between eye movement and potential usability issues. Overall, most participants were able to perform the tasks successfully. However, the study did identify some usability problems such as unclear terminologies, which led to confusion among users. Additionally, some recommendations were put forward to enhance the usability and user experience of the UUM Student Portal.

Keywords: Eye-tracking usability, human-computer interaction, student portal.

PID107

Designing and Developing M-Thyroid Care for Mobile Virtual Consultation

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This research paper presents the design and development process of the M-Thyroid Care app, a mobile application prototype aimed at facilitating virtual video call-based consultations for thyroid clinics using design-based research. The app offers a convenient and accessible platform for remote consultations, enabling patients and healthcare providers, especially doctors, to engage through video calls. Additional features like chat functionality and file-sharing capabilities are incorporated to facilitate seamless communication and information exchange between patients and healthcare providers. The motivation behind developing M-Thyroid Care stems from the need to address the challenges associated with unurgent illness physical visits, specifically focusing on follow-up appointments for thyroid disorder patients. It is important to note that the app is not intended to replace physical visits but to assist clinics and healthcare providers in managing their time more effectively, allowing for more in-clinic consultations, particularly for new thyroid disorder patients. By eliminating the need for physical visits, M-Thyroid Care offers several benefits. Patients can save on travel, parking, childcare, and other related expenses, resulting in enhanced convenience and cost-effectiveness. Moreover, reducing physical visits can reduce traffic congestion and emissions, aligning with sustainable environmental practices. In summary, M-Thyroid Care represents a significant step towards leveraging mobile technology to improve thyroid healthcare consultations. The insights gained from the design and development process of M-Thyroid Care contribute to the broader understanding of designing mobile healthcare apps for remote consultations, serving as a valuable resource for future app development in telemedicine and mobile healthcare.

Keywords: M-Thyroid Care, Mobile Healthcare App, Virtual Consultations

PID108

Blockchain over Named Data Networking Architecture: A Review

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With infinite apps and online services, future Internet architecture will face new challenges and consequences, such as scalability, dependability, suitable mobility, and security. Internet use has changed spectacularly from one-way communication to content distribution, as much content is generated every minute. Blockchain and Named Data Networking (NDN) are two cutting-edge technologies on the verge of revolutionizing how we use the Internet. Blockchain is a decentralized ledger technology allowing users to store and share data securely. On the other hand, NDN is a new way of networking that focuses on content instead of location. Combining blockchain and NDN can create a safer, more efficient, and more decentralized internet. Blockchain can provide tamper-proof data records, and NDN can deliver content to users efficiently and securely. This paper emphasizes the importance of research in the field of blockchain over Named Data networks. It highlights the advantages of combining blockchain with NDN and discusses the difficulties and open research questions related to the use of blockchain over NDN. Also, the potential impact of blockchain over NDN on the future of the Internet as it can create a safer, more efficient, and more decentralized Internet.

Keywords: Blockchain, Content Distribution, Content-Centric Network, Future Internet

PID109

The Effectiveness of Conducting STEM Projects Using Design Thinking Approach in Rural Schools in Kedah, Malaysia: A Smart Farming Project

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STEM education is vital in today's learning curriculum. Incorporating Design Thinking into STEM projects such as smart farming, particularly in rural schools in Malaysia where access to technology and resources are scarce, allow teachers and students to experience an enriching teaching and learning experience. In this paper, we employ the Design Thinking approach to gauge the effectiveness of implementing STEM projects such as smart farming to the teachers and students in rural schools. A survey is carried out to measure the effectiveness of the approach and it is shown that the Design Thinking approach helped both teachers and students to develop innovative solutions to benefit the society. Students and teachers also demonstrate increased creativity, problem-solving skills, empathy, and collaborative learning when they solve STEM problems using the Design Thinking approach.

Keywords: STEM Education, Internet of Things, Smart Farming

PID110

Enhancing Supervisor Response Time: An Exploration of the Social Representation Theory of Shame in ELISTA

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The Final Project is a student research course guided by a supervisor, involving activities from research proposal to reporting. Slow supervisor response times hinder project completion. This action research applies the social representation theory of shame to improve response times. A response time display feature is introduced in the ELISTA web application, visible to lecturers, colleagues, and leaders. The hypothesis is that this visibility will lead to shame, prompting lecturers to improve their responsiveness. Results show a significant increase in the percentage of lecturers responding within the six-day limit, rising from 9.37% in the pre-action to 36% in the third cycle. Supervisors feel embarrassed by extended response times in the "red zone." The web application with response time display accelerates student final project completion effectively.

Keywords: Final Project, Response Time, Shyness, Social Representation Theory

PID111

Penetration Testing Implementation Using Smartphone: A Systematic Literature Review

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There is no denying the widespread prevalence of mobile devices and the indispensable role that smartphones have come to play in our daily lives. The expected rise to 18.22 billion mobile devices by 2025 means that smartphone dependency will only increase. As a result of the market for smartphones, several different manufacturers are now producing their own models, each with their own unique operating system. The computing capacity of modern smartphones has also increased, making them functionally equivalent to little computers. There has been a concerted effort by software developers to close the gap between desktop computers and smartphones by making apps that work on both platforms. One of the most widely used desktop penetration testing tools, Kali Linux, has

been ported to mobile devices and given the name Kali NetHunter. The increased use of wireless mobile devices has led to a growing need for better wireless network security and penetration testing methods. This paper presents the findings from systematic literature review on previous works of Penetration Testing Implementation Using Smartphone.

Keywords: Cybersecurity, Kali NetHunter, Penetration Testing, Smartphone.

PID112

Early Detection of School Disengagement Using *MyBuddy* Application

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School disengagement is one of the pressing topics for educational equity in many countries worldwide, which will lead to school dropout. Dropping out of school has adverse consequences, including negative effects on employment, lifetime earnings, and physical health. Several attempts have been made to solve engagement issues, for example, the development of an intelligent tutoring system (ITS), which is useful to know when a student has disengaged from a task and might benefit from a particular intervention. However, predicting disengagement on a trial-by-trial basis is a challenging problem, particularly in complex cognitive domains. This paper emphasizes on *MyBuddy* mobile application which has been developed as a smart classifier to identify level of school disengagement risk among at-risk students in secondary schools. The working engine of *MyBuddy* is translated from a computational model which comprises fourteen predictors of four main entities; student, family, school, and surrounding. This application employs advanced mathematical models to analyze the data and generate level of risk scores that indicate the likelihood of dropout. This empowers counselors to proactively intervene and provide targeted support to the students who require it the most. *MyBuddy* offers a centralized platform to access and analyze aggregated data from multiple schools. This functionality allows them to smartly identify patterns, trends, and systemic challenges contributing to dropout rates. With comprehensive data-driven insights, district and state officers can design effective interventions and allocate resources strategically to mitigate dropout risks. The utilization of *MyBuddy* with the aims to revolutionize dropout prevention and foster a more inclusive and equitable education system in Kedah, Malaysia, is in line with the fourth Sustainable Development Goals which aims to provide quality education for everyone.

Keywords: school disengagement, school dropout, school disengagement detection, smart classifier

PID113

A Review of Policy on Creative Industry for Sustainable Nation: A Malaysian Perspective

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The Malaysian *Dasar Industri Kreatif Negara* (DIKN), or the Malaysian National Creative Industry Policies (NCIP), was launched in 2010 and has created a list of creative offerings that were broken down into three sectors: Creative Multimedia, Creative Cultural Arts, and Creative Cultural Heritage. Each of these sectors has its behaviors, problems and mechanisms and requires a tailored approach to its promotion. The main objective of the policy is to promote creativity sustainably, ensuring both economic and social benefits. It has now been ten years since NCIP was launched. Although it has generally shown a positive effect, the vibrancy of the creative economy is still less than satisfactory compared to other Asian countries such as Indonesia and Thailand. Until now, no comprehensive study has been conducted on the effectiveness and impact of NCIP on the country. Therefore, this article discusses the existing problems and compares the policies of different countries regarding the

development of the creative industries sector. To achieve the objectives of the study, a three-stage approach was adopted, including a comparative analysis and synthesis of the literature on creative industries concepts and policies, a quantitative survey of 134 creative industries stakeholders in Malaysia on their views on the NCIP, and generalization of the overall findings. Findings from this study show that there are big spaces for improvements in the current policy in line with new trends and technological advancements. The results of this study will be able to highlight the weaknesses of existing policies in Malaysia and suggest improvements in the scope of the field, as well as propose a strategic framework for the development of Malaysia's creative industries sector.

Keywords: creative industry policy, sustainable nation, gross domestic product

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