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Arab Open University
Oman

27-28 April 2025

ICDTAIM 2025

INTERNATIONAL CONFERENCE ON DIGITAL TRANSFORMATION AND AI-DRIVEN INNOVATION MANAGEMENT 2025

"Bridging Digital and Managerial Innovation: Navigating the Future Together"

CVAC
FACULTY OF COMMUNICATION VISUAL ART & COMPUTING

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YAYASAN UNIVERSITI SELANGOR

SELANGOR RESEARCH INSTITUTE

VALET TECHNOLOGY

WELCOMING ADRESS

The Honourable Senator Prof. Emeritus Dato' Dr. Mohammad Redzuan Othman
President and Vice Chancellor
Universiti Selangor (UNISEL)
Malaysia

It is my distinct honor and privilege to welcome you to the International Conference on Digital Transformation and AI-Driven Innovation Management 2025 (ICDTAIM 2025), organized by Universiti Selangor (UNISEL) in collaboration with the Arab Open University, Oman, and supported by the Selangor Research Institute (SRI) as our research and publication partner.

This conference stands as a shining example of how academic collaboration can transcend borders and bring together institutions, researchers, and professionals who are united by a common goal—to explore, innovate, and lead in the age of digital transformation and AI-driven development.

As digital technologies continue to reshape industries, economies, and societies, the need for strong cooperation among academia, government, and industry is more vital than ever. Research provides the foundation, policy offers direction, and industry delivers implementation. ICDTAIM 2025 serves as a critical platform where these forces converge—offering an environment for knowledge exchange, thought leadership, and strategic partnership.

More than just a scholarly event, this conference is a space where ideas are born, collaborations are forged, and impactful solutions are envisioned. From keynote addresses and expert panels to paper presentations and workshops, every session is an opportunity to inspire and be inspired.

I would like to take this opportunity to express my sincere appreciation to our valued partners—Arab Open University, Oman, for their strong academic collaboration, and Selangor Research Institute (SRI), for their vital role in supporting research and publication efforts.

Most importantly, I wish to extend my heartfelt congratulations to the Faculty of Communication, Visual Art and Computing, Universiti Selangor, for taking the lead in organizing this international conference. Your initiative, dedication, and commitment to excellence are truly commendable. You have demonstrated the spirit of leadership and academic drive that UNISEL stands for.

To all participants, presenters, speakers, and contributors—thank you for being part of ICDTAIM 2025. May this conference spark transformative ideas, meaningful partnerships, and a renewed commitment to shaping a future where technology serves humanity with purpose and integrity.

Wishing you a successful and enriching ICDTAIM 2025.
Thank you.

Prof. Mohammed Hamdan Al Badi
Rector
Arab Open University (AOU)
Oman

Distinguished Guests,

Esteemed Researchers and Academics,

It is with great honor and immense pleasure that I welcome you all to the International Conference on Digital Transformation and AI-Driven Innovation Management 2025 – ICDTAIM 2025.

This landmark event is a proud moment for the Arab Open University, Oman, as we host this prestigious international conference in collaboration with our esteemed partners from Universiti Selangor, Malaysia. More than just a gathering of brilliant minds, this conference is a testament to our collective commitment to fostering international academic collaboration, driving innovation, and nurturing a global research community.

The partnership between Arab Open University and Universiti Selangor, solidified through a Memorandum of Understanding in 2024, has grown into a dynamic and productive alliance. It has united diverse intellectual talents under one shared vision: creating a vibrant platform for knowledge exchange in some of the most critical and transformative areas of our time.

At Arab Open University, we take great pride in championing a culture of research and academic excellence. We actively support our faculty through internal research funding and encourage the pursuit of innovative, multidisciplinary research. Our academic staff have also earned competitive grants from the Ministry of Higher Education, Research and Innovation (MoHERI) and other national and international funding bodies—further underscoring their dedication and the strength of our research ecosystem.

We are equally committed to forging meaningful partnerships with government and industry stakeholders to ensure our research is not only rigorous but also relevant. These collaborations align our work with national development priorities and global trends—especially in areas such as digital transformation, artificial intelligence, sustainability, and education innovation. Together, we aim to elevate the impact of research both locally and globally.

At the heart of our research mission lies a steadfast commitment to the United Nations Sustainable Development Goals (SDGs). We believe that universities have a crucial role to play in solving global challenges—from quality education and gender equality to sustainable development and climate action. Our research agenda is therefore designed to be interdisciplinary, impactful, and deeply connected to real-world needs.

Across our university's campuses, ongoing projects are increasingly aligned with these goals. Whether it's developing AI tools to improve healthcare, advancing inclusive education, or promoting sustainable business models, our faculty and students are creating knowledge that empowers communities and shapes a better future.

This conference also resonates deeply with the vision laid out in Oman Vision 2040—a blueprint for a knowledge-driven, innovation-led economy. Vision 2040 places education, research, and innovation at the center of national progress. At Arab Open University, we are fully committed to realizing this vision by equipping future generations with the skills and mindset they need to thrive in a rapidly evolving world.

In today's era—defined by rapid digital transformation and the accelerating influence of artificial intelligence—events like ICDTAIM 2025 serve as essential platforms. They guide policymakers, educators, industry leaders, and researchers toward innovative solutions and forward-thinking strategies in the age of intelligent systems.

As the host institution, Arab Open University is proud to reaffirm its dedication to international recognition, research excellence, and cross-border collaboration. We believe the future of education lies in building bridges—between disciplines, between institutions, and across cultures. ICDTAIM 2025 stands as a powerful example of that belief in action.

To our partners at Universiti Selangor, thank you for your unwavering support and collaboration. To our organizing committees, keynote speakers, presenters, and attendees—thank you for your invaluable contributions that have brought this event to life.

To all our participants: May your time here be intellectually enriching, your discussions inspiring, and your collaborations lasting.

Welcome to ICDTAIM 2025, and welcome to AOU Oman.

Ts Dr. Latifah Abd Latib
Conference Chair, ICDTAIM 2025
Deputy Dean (Research & Postgraduate)
Faculty of Communication,
Visual Art and Computing
Universiti Selangor (UNISEL)
Malaysia

It is with immense pleasure and great honor that I welcome you to the International Conference on Digital Transformation and AI-Driven Innovation Management (ICDTAIM 2025).

This year's conference, organized by the Faculty of Communication, Visual Art & Computing, Universiti Selangor (UNISEL), Malaysia, and proudly co-hosted by the Arab Open University, Oman, brings together scholars, researchers, policymakers, and industry professionals from around the globe — all united by a shared mission: to explore, shape, and accelerate the journey of digital transformation and innovation in the age of Artificial Intelligence.

Held at the vibrant and forward-thinking campus of Arab Open University, Oman, this conference serves as a vital platform for intellectual exchange and collaboration. As the digital landscape continues to evolve at an unprecedented pace, so too must our strategies, policies, and academic pursuits. ICDTAIM 2025 is designed to spark meaningful dialogue and foster partnerships that transcend borders and disciplines.

We are especially proud of the diversity of voices featured in this year's program — from cutting-edge research presentations and keynote addresses to collaborative panels that highlight the intersections of government, academia, and industry. This convergence reflects the very nature of innovation today: multidisciplinary, inclusive, and driven by both technology and human insight.

I would like to extend my deepest appreciation to our co-hosts, the Arab Open University, for their gracious hospitality and invaluable partnership, as well as to all contributors and delegates whose dedication and passion make this event possible. Special thanks also go to our organizing committees, reviewers, and supporting institutions for their tireless efforts behind the scenes.

Let us embrace this opportunity to share knowledge, build connections, and collectively inspire the future of AI and digital transformation. May ICDTAIM 2025 be a catalyst for discovery, collaboration, and impactful change.

Welcome to Muscat, and welcome to ICDTAIM 2025.

Dr. Yousuf Nasser Said Al Husaini
Conference Deputy Chair, ICDTAIM 2025
Assistant Dean
Faculty of Computer Studies
Arab Open University (AOU)
Oman

It is my great honor and privilege to welcome all participants, speakers, researchers, and guests to the International Conference on Digital Transformation and AI-Driven Innovation Management 2025 (ICDTAIM 2025). This conference represents not only a gathering of intellectual minds but also a milestone in academic cooperation between Arab Open University and Universiti Selangor, Malaysia.

As Conference Deputy Chair representing the Arab Open University, I am proud to witness the successful realization of this event, which is the product of a strong collaboration formalized through the Memorandum of Understanding signed in 2024. ICDTAIM 2025 is a reflection of our shared vision to advance innovation, research, and knowledge exchange across borders, especially in the rapidly evolving domains of artificial intelligence, digital transformation, and innovation management.

Arab Open University is deeply committed to creating a thriving research environment. We provide internal funding for all our academic staff and are proud to see many of them securing prestigious grants from the Ministry of Higher Education, Research and Innovation (MoHERI) and other national and international funding agencies. Our research initiatives are increasingly collaborative, extending partnerships with governmental, industrial, and academic entities to ensure impactful and sustainable outcomes.

Our university's research efforts are also aligned with the United Nations Sustainable Development Goals (SDGs) and Oman Vision 2040. We are dedicated to producing knowledge that addresses real-world challenges, whether in education, technology, healthcare, or sustainability. Through events like ICDTAIM, we aim to contribute meaningfully to the national and global research landscape while empowering future generations with transformative insights and skills.

This conference is more than just a platform for academic dialogue, it is a launching pad for future collaborations, policy-shaping discussions, and innovative breakthroughs. I am confident that the ideas and partnerships born here will echo far beyond this gathering and create a lasting impact in our respective institutions and societies.

Welcome once again to ICDTAIM 2025

KEYNOTE SPEAKERS

KEYNOTE SPEAKER 1

The Honourable Senator Prof. Emeritus Dato' Dr. Mohammad Redzuan Othman
President and Vice Chancellor
Universiti Selangor (UNISEL)
Malaysia

Abstract

As Artificial Intelligence (AI) becomes increasingly integrated into every aspect of modern life, nations are faced with the challenge of balancing technological advancement with social and cultural responsibilities. In Malaysia, AI is being approached not solely as a tool for automation and efficiency, but as a transformative force aligned with national values and human development. Guided by Prime Minister Anwar Ibrahim's MADANI vision, the country emphasizes empathy, inclusivity, and responsible innovation. Strategic initiatives such as Selangor's Smart State model and Universiti Selangor's integration of AI into Technical and Vocational Education and Training (TVET) demonstrate a commitment to bridging digital divides and expanding access to future-ready skills. Malaysia's approach is also deeply rooted in Islamic intellectual heritage, drawing on figures like Al-Khwarizmi and Ibn Sina to frame AI as an ethical trust (amanah) that must serve justice, welfare, and education. With more than 40 universities adopting AI education and an anticipated RM115 billion contribution to GDP by 2030, Malaysia is poised to play a leading role in Southeast Asia's AI ecosystem. However, challenges remain in ensuring equity, mitigating workforce disruption, and maintaining ethical oversight. This paper underscores the importance of interdisciplinary collaboration and culturally grounded strategies in building an AI-powered future with conscience.

Biography

The Honourable Senator Professor Dato' Dr. Mohammad Redzuan Othman is a distinguished academic, public intellectual, and expert in history and Middle Eastern politics. In March 2025, he was appointed as a Senator in the Dewan Negara, representing the Dewan Negeri Selangor. In 2024, he was conferred the title Professor Emeritus by the University of Malaya during its 64th Convocation Ceremony, in recognition of his outstanding contributions to academia.

Since 2016, he has served as the President and Vice-Chancellor of Universiti Selangor (UNISEL), making him the university's longest-serving head. Under his leadership, UNISEL has strengthened its mission in inclusive, community-focused education. He is also the Founder and Executive Chairman of Institut Darul Ehsan (IDE), established in 2015, where he continues to influence public policy and state-level research.

Over his academic career, Prof. Redzuan has supervised 32 PhD and 29 Master's graduates and authored over twenty books, including the acclaimed Secularism and Democratic Processes in Turkey. He was a panelist for the International Permanent Human Rights Commission (IPHRC OIC) (2019–2022) and has served on national-level committees such as the Consultative Council on Foreign Policy and the Special Committee on Election System and Law Reforms.

Earlier, during his 31-year tenure at the University of Malaya, he rose from tutor in 1984 to full professor in 2005, holding prominent roles such as Head of the Department of History, Deputy Dean, and Dean of the Faculty of Arts and Social Sciences. He was also the founding director of UMcedel (University Malaya Centre for Democracy and Election), serving from 2010 to 2014. He later became the first Dean of the Humanities and Ethics Research Cluster, contributing significantly to academic governance, staff development, and interdisciplinary research.

Prof. Redzuan's legacy reflects a lifelong commitment to scholarship, ethical leadership, and national service. His work continues to shape Malaysia's academic, political, and civic landscapes.

KEYNOTE SPEAKER 2

Dr. Salim Al-Shuaili
Director, AI and Advanced Technology Projects Ministry of Transport, Communications, and Information Technology
Oman

Abstract

The National Program of AI and Advanced Digital Technology 2025 outlines Oman's strategic vision to harness artificial intelligence (AI) and cutting-edge digital technologies in alignment with Oman Vision 2040. The program aims to accelerate the adoption and localization of AI technologies across key economic and developmental sectors while ensuring human-centered governance and ethical implementation. The initiative is structured around three main pillars: promoting AI adoption, localizing technologies, and establishing robust governance frameworks. The program sets ambitious performance targets, including a 20% annual growth in AI startups, investments, and research collaborations, as well as enhancing public awareness and ethical practices in AI deployment. A notable milestone includes surpassing one of its primary KPIs—Oman not only aimed to be among the top 50 countries in AI readiness but successfully achieved the 45th position globally, reflecting the nation's rapid progress and commitment.

Oman has made notable progress with the launch of the AI Makers Initiative, eight AI applications through generative AI competitions, and the allocation of over 60 million OMR in AI investments between 2021–2024. Strategic projects such as OmanGPT, the AI Studio, a national open data portal, and a research center further strengthen the ecosystem. Additionally, the partnership with the World Economic Forum for the Fourth Industrial Revolution Center and the hosting of the ICESCO AI Ethics Chair highlight Oman's growing international presence in the AI domain. This program stands as a transformative blueprint to position Oman as a regional leader in responsible and impactful AI innovation.

Biography

Dr. Salim Al-Shuaili is a distinguished Omani expert with over 23 years of experience in Information and Communication Technology (ICT), specializing in technology adoption, artificial intelligence, and digital transformation. He holds a PhD in ICT and currently serves as the Director of the AI and Advanced Technology Projects Unit, as well as the CEO and Co-Founder of Maidaan.ai. Dr. Al-Shuaili is a Certified Chief AI Officer by the World AI Council (Canada), a Global AI Ambassador for the Global Council of Responsible AI (USA), and a professional member of the International Federation Council

of Global ICT (IFCGICT), affiliated with the United Nations. He actively contributes as a judge for GCC AI projects and global AI awards and serves on academic advisory boards of several universities, including Sultan Qaboos University, the Arab Open University, and Sohar University. His exceptional leadership has been recognized through awards such as the Digital Transformation Inspiring Award (Thailand, 2022) and the Impact Trailblazer Award (Azerbaijan, 2023). Dr. Al-Shuaili plays a vital role in national efforts to localize AI and leads transformative projects across diverse sectors including e-Government, smart cities, health, education, mining, tourism, agriculture, logistics, transportation, crisis management, and media. He is a prolific contributor to international and local conferences and is also an author of multiple research publications, books, and media features.

COMMITTEE

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AGENDA

DAY 1 > Sunday, 27/4/2025

Venue: Arab Open University

Time	Activity
09:00 am	Conference Registration Refreshment
10:00 am	**Opening Ceremony Welcome Address** Prof. Mohammed Al Badi Rector Arab Open University, Oman Link 1: https://teams.microsoft.com/meet/372423880032?p=BnRE3uJEjZVnikIfrl
10:20 am	**Welcoming Remarks for the Conference** Ts. Dr. Latifah Abd Latib
10:30 am	**Keynote Addresses:** • Speaker 1 **The Honourable Senator Prof. Emeritus** **Dato' Dr. Mohammad Redzuan Othman** President and Vice Chancellor, Universiti Selangor, Malaysia • Speaker 2 **Dr. Salim Al Shuaili** Director, AI and Advanced Technology Projects Ministry of Transport, Communications, and Information Technology, Oman
11:20 am	Honoring the speakers Group photo Break
12:00 pm	**Forum:** **The Impact of AI on IT Governance and Risk Management** • Moderator : Ts. Dr. Latifah Abd Latib • Panelist 1 : Dr. Salim Al Shuaili • Panelist 2 : Dr. Sherimon PC • Panelist 3 : Ts. Dr. Wan Azlan bin Wan Hassan • Panelist 4 : Dr. Falah Younis
01:00 pm	Lunch Break
02:00 pm	**Parallel Sessions:** **Conference Paper Presentation** • Track 1 : Emerging Applications and Technologies Location : Training Hall 1 Moderator : Dr. Alaa Ismaeel

- Track 2 : Cybersecurity and Risk Management
  Location : Training Hall 2
  Moderator : Dr. Ahmed Mahfouz

- Track 3 : Emerging Technologies in Digital Transformation
  Location : FCS Meeting Room
  Moderator : Dr. Rawad Abdulghafor and Dr. Yousuf Al Husaini

- Track 4 : IT Governance and Data Driven Innovation
  Location : BUS Meeting Room
  Moderator : Dr. Wasin Al Kishri and Dr. Mahmood Al Bahri

- Track 5 : Emerging Applications and Digital Infrastructure
  Location : Academic Meeting Room
  Moderator : Dr. Laila Abdellatif and Dr. Mohammad Abrar

End of Day 1 Session

DAY 2 > Monday, 28/4/2025

Venue: Arab Open University

Time	Activity
09:00 am	**Parallel Workshops**

- Workshop 1: AI Toolkit Mastery: Enhancing Productivity and Problem Solving
  Location : Training Hall – 1
  Presenter : Ts. Dr. Irny Suzila Ishak

- Workshop 2: Crafting Scholarly Excellences:
  A Guide to Effective Journal Writing
  Location : Training Hall – 2
  Presenter : Assoc. Prof. Dr. Nur Syufiza Ahmad Shukor

12:00 pm Lunch Break

End of Day 2 Session

PARALLEL SESSIONS

ROOM 1 > Emerging Applications and Technologies

(Training Hall - 1)

PRESENTATION SCHEDULE

Track : Emerging Applications and Technologies

Moderator : Dr. Alaa Ismaeel

Time	Paper ID	Title	Presenter(s)
2.00-2.20 pm	T015	Scalable ICT Framework for Advancing Smart Campus Solutions in Universities.	Lohani Adeeb Khan
2.20-2.40 pm	T046	Enhancing AI-Based Software Testing: Challenges in Software Testing and Their Impact on Software Quality.	Marina Hassan
2.40-3.00 pm	T025	Requirements Elicitation for an Online Counselling Management System for Mental Health Services at the Perak State Health Department.	Shireen Muhammad
3.00-3.20 pm	T026	Revolutionizing Business Models: Adapting to Digital Disruptions with AR & VR.	Marliza Abdul Malik
3.20-3.40 pm	T027	Digital-First Engagement in Higher Education: Marketing Kit with Augmented Reality for Universiti Selangor (MeKAR UNISEL) Case Study.	Suhaimi Mohd Noor
3.40-4.00 pm	T028	Spanning Tree Approach for Prioritizing Functional Requirements in Developing an Academic Financial Systems.	Norhawani Ahmad Teridi
4.00-4.20 pm	T040	The Impact of Communication Technology Integration on Self Learning Behaviour Among University Selangor Bestari Jaya's Undergraduate Students.	Faizul Mohd Noh
4.20-4.40 pm	T043	A User-Centric AI Web Application for Accurate and Efficient Green Herb Identification.	Faudzi Ahmad
4.40-5.00 pm	T044	Developing Self-Management Skills in Children by Mobile Technology: A Design-Driven Approach.	Nor Aziyana Abd Rahman

T015

Title:

Scalable ICT Framework for Advancing Smart Campus Solutions in Universities

Authors:
Setyawan Widyarto, Adeeb Khan Lohani and Latifah Abd Latib

Abstract:
Global advancements in educational technology have driven universities to adopt smart campus solutions that optimize resources, enhance security, and elevate user experiences. However, while leading institutions in developed regions have successfully integrated Building Management Systems (BMS) and Campus Management Systems (CMS), there is a noticeable gap in frameworks tailored to the unique challenges of developing countries. The University of Nizwa (UoN) in Oman, operating under traditional campus models with fragmented systems, faces operational inefficiencies, limited automation, and sustainability challenges. This research addresses the lack of a unified integration framework to support UoN's transition into a smart campus, aligning with Oman Vision 2040 and global sustainability goals. This study aims to develop an integrated ICT framework that combines CMS and BMS to improve operational efficiency, sustainability, and user experience at UoN, serving as a model for similar institutions in developing regions. A mixed-method approach was applied, beginning with a literature review, stakeholder interviews, and comparative case studies to identify functional and technical requirements. The research followed a multi-phase process involving the design of use cases, the development of a comprehensive integration framework, and validation through simulations and pilot testing within UoN's environment. The study suggests that the seamless integration of CMS and BMS can significantly improve resource utilization, real-time data analytics, user satisfaction, and energy management while supporting scalable and sustainable operations. The proposed framework offers a scalable solution for developing smart campuses in emerging economies. It provides practical insights for policymakers, educational institutions, and industry stakeholders, promoting digital transformation, sustainability, and enhanced educational experiences across similar contexts.

Keywords:
Smart Campus, Building Management System (BMS), ICT Integration, Operational Efficiency, Sustainability in Higher Education.

T046

Title:

Enhancing AI-Based Software Testing: Challenges in Software Testing and Their Impact on Software Quality

Authors:
Marina Hassan and Nur Syufiza Ahmad Shukor

Abstract:
Software testing is a crucial phase in software development, ensuring reliability, security, and performance. However, rapid technological advancements, evolving software architectures, and the push for continuous deployment introduce significant challenges in testing. Traditional testing methods struggle to keep pace with modern software practices such as Agile, DevOps, and AI-driven development. This paper aims to identify and analyze the key challenges in software testing and propose effective strategies to enhance testing efficiency and reliability. It also explores emerging solutions and best practices to enhance testing efficiency. Many organizations face difficulties in maintaining test reliability, achieving adequate test coverage, and addressing non-functional requirements such as security and performance. Rapid evolution of AI and machine learning-based applications introduces new testing complexities. A systematic review using PRISMA techniques of recent literature was conducted. The study evaluates various testing methodologies, tools, frameworks and security, focusing on their effectiveness in addressing modern software testing challenges. Findings reveal that while AI-driven testing, shift-left testing, and continuous monitoring offer promising solutions, challenges such as unreliable test automation, lack of skilled testers, and security gaps remain prevalent. The study highlights the importance of adaptive testing strategies and the integration of AI with human expertise for better test accuracy. To improve software quality, organizations must adopt a hybrid testing approach that combines AI-powered automation with manual testing for complex scenarios. Continuous learning and upskilling in modern testing methodologies are essential. Future research should focus on refining AI-driven testing tools and enhancing security testing frameworks.

Keywords:
Software Testing, Test Automation, AI in Testing, Software Quality, Agile Testing.

T025

Title:

Requirements Elicitation for an Online Counselling Management System for Mental Health Services at the Perak State Health Department

Authors:
Shireen Muhammad, Samini Saravanan, Siti Sarah Nereesa Azmi and Yusmadi Yah Jusoh

Abstract:
In the domain of mental healthcare, the absence of standardised record-keeping practices presents a significant challenge for mental health professionals, resulting in inconsistencies in the management of counselling records. At the Psychology Unit of the Perak State Health Department, the reliance on paper-based record systems has led to a cascade of operational impediments, encompassing restricted accessibility to crucial information, the potential for irretrievable data loss, inefficiencies in the systematic organisation. The research endeavours to define the system requirements for designing online counselling management systems, utilizing a rigorous methodology centered on elicitation and expert review validation techniques. Basic requirements were synthesized from five existing online counselling management systems. They were then validated by five counsellors that were purposefully selected as respondents in phone, video and in-person interviews, depending on their preference and feasibility. The scope of the study is limited to determining functional requirements for such systems, rather than non-functional requirements. The expected outcome is a set of system requirements for designing the online counselling management systems.

Keywords:
Medical Record, Functional Requirement, Expert Review.

T026

Title:

Revolutionizing Business Models: Adapting to Digital Disruptions with AR & VR

Authors:
Marliza Abdul Malik, Suhaimi Mohd Noor, Rosnita A Rahaman, Muhammad Azizi Azhar, Norhayati Mohd Amin and Salyani Osman

Abstract: The digital age has ushered in transformative disruptions that continue to challenge traditional business models and compel organizations across all sectors to innovate. To remain competitive, businesses must adapt to rapidly evolving technological landscapes and shifting consumer expectations. This paper explores how emerging technologies, particularly augmented reality (AR) and virtual reality (VR), can be strategically integrated into modern business models to enhance value creation, customer engagement, and operational efficiency. These immersive tools are no longer limited to niche applications; they are reshaping industries by enabling interactive experiences, streamlining decision-making, and strengthening brand identity. Through detailed case studies of leading innovators such as Amazon, Netflix, and Tesla, alongside Universiti Selangor (UNISEL), which has implemented the MeKAR UNISEL AR marketing kit and the Unisel Virtual Tour (UNIVT), this paper illustrates the diverse applications and benefits of AR and VR technologies. The analysis highlights several strategic approaches—including platform-based ecosystems, agile development models, and data-driven innovation—that support successful digital transformation. Ultimately, this study concludes that the integration of AR and VR is not a temporary trend but a crucial step for organizations aiming to achieve sustainable growth, improve competitive positioning, and thrive in a digitally dominated future.

Keywords:
Business Models, Virtual Reality, Augmented Reality.

T027

Title:

Digital-First Engagement in Higher Education: Marketing Kit with Augmented Reality for Universiti Selangor (MeKAR UNISEL) Case Study

Authors:
Suhaimi Mohd Noor, Marliza Abdul Malik, Rosnita A Rahaman, Muhammad Azizi Azhar, Norhayati Mohd Amin and Salyani Osman

Abstract:
The Marketing Kit with Augmented Reality for Universiti Selangor (MeKAR UNISEL), a project aimed at enhancing UNISEL's marketing and engagement strategy through the integration of augmented reality (AR) technology. From a business model perspective, MeKAR UNISEL represents a shift toward a digital-first approach, where value is delivered through interactive, user-centric experiences. The primary objective was to enrich the university's outreach capabilities by offering prospective students and public an engaging platform to explore UNISEL's academic programs, campus life, and facilities. By enabling users to interact with AR content, the institution redefined how information is communicated, moving beyond static brochures. This aligns with the broader trend of organizations embedding digital technologies into their marketing strategies. User's feedback confirmed the application's ease of use and effectiveness. As a result, MeKAR UNISEL has not only met its immediate objectives but also demonstrated its potential as a scalable, innovative tool that strengthens UNISEL's brand identity and supports long-term institutional growth in a competitive digital landscape.

Keywords:
Augmented Reality, Marketing, Digital Technology.

T028

Title:

Spanning Tree Approach for Prioritizing Functional Requirements in Developing an Academic Financial Systems

Authors:
Norhawani Ahmad Teridi, Zahrul Azwan Absl Kamarul Adzhar, Nasrudin Md Rahim and Nik Nordiana Nik Ab Rahman

Abstract:
This study presents a systematic approach to prioritizing functional requirements in the development of an academic financial system using graph theory and spanning tree analysis. The research adopts a qualitative methodology, beginning with the construction of a Work Breakdown Structure (WBS) to identify and organize financial processes typically found in higher education institutions, such as student billing, sponsorship management, refund processing, and salary deductions for tuition payments. These processes were then modelled as nodes in a directed graph to represent their interdependencies. Using Depth-First Search (DFS) and Breadth-First Search (BFS) algorithms, spanning trees were generated to trace critical paths and reveal task hierarchies. The analysis identified the Utilities module as the most fundamental component, required for the successful execution of all other modules. Additionally, key financial tasks such as Invoice Generation, Debit and Credit Notes, and Discount Notes demonstrated mutual dependencies, indicating complex parallel relationships. The decomposition of the graph into multiple spanning trees allowed for clearer visualization of task sequences and prioritization. Interestingly, modules like Bad Debt Processing, though initially ranked lower, were found to be vital due to their influence on subsequent processes. This approach demonstrates the effectiveness of graph-based analysis for uncovering both obvious and latent priorities, offering a practical and structured methodology to enhance the design, planning, and implementation of academic financial systems.

Keywords:
Academic Financial System, Functional Requirements, Spanning Tree Analysis, Task Prioritization.

T040

Title:

The Impact of Communication Technology Integration on Self Learning Behaviour Among University Selangor Bestari Jaya's Undergraduate Students

Authors:
Faizul Mohd Noh and Surendran Mahadevan

Abstract:
In the digital era, communication technology has become a critical component influencing self-learning behaviours among university students, reshaping traditional educational methodologies and enhancing student engagement. This study aims to evaluate the impact of communication technology integration on self-learning behaviour among undergraduate students at University Selangor Bestari Jaya. Employing a quantitative research design, data were collected from a structured survey administered to 357 respondents and analysed using descriptive and correlation analysis via SPSS to explore relationships between technology usage and self-learning behaviours. The findings reveal a strong positive correlation between the frequency of technology use and self-learning behaviour (r = 0.768), with the types of communication technology utilized also demonstrating significant positive impacts (r = 0.795). Participants displayed enhanced academic independence and engagement with educational content through the effective use of digital tools, indicating that technological integration fosters a more active learning environment. The study concludes that both the frequency and diversity of communication technology usage are crucial in promoting self-directed learning, thereby emphasizing the necessity for educational institutions to implement diverse digital resources that cater to varied learning needs, ultimately facilitating improved academic performance in an increasingly digitalized educational landscape. These insights contribute to a deeper understanding of how strategic integration of technology can enrich the learning experiences of students and highlight the importance of fostering digital literacy within academic curricula.

Keywords:
Communication Technology, Self-Learning Behaviour, Digital Learning, University Students, Technology Integration.

T043

Title:

A User-Centric AI Web Application for Accurate and Efficient Green Herb Identification

Authors:
Tengku Azrin Tengku Ahmad, Faudzi Ahmad and Rasidah Sardi

Abstract:
The increasing demand for fresh herbs has led to a surge in herb varieties available in the market. However, accurate herb identification can be challenging for consumers, often leading to misidentification and purchase of incorrect herbs. To address this issue, an AI-powered web application is developed that utilizes computer vision and machine learning techniques to accurately identify green herbs. Employing an Agile methodology and incorporating user-centered design principles, the web app was designed to be user-friendly and efficient. By providing accurate herb identification, this tool aims to enhance the culinary experience, reduce food waste, and empower consumers to make informed choices.

Keywords:
Herb Identification, Computer Vision, Machine Learning.

T044

Title:

Developing Self-Management Skills in Children by Mobile Technology: A Design-Driven Approach

Authors:
Nor Aziyana Abd Rahman, Muhammad Azizi Azhar, Laili Mardziah Tajuddin and Puteri Irdina Megat

Abstract:
Particularly in assuming responsibility for finishing home chores, children in the early phases of development frequently struggle with self-management abilities. Parents are also finding it difficult to instruct their kids to carry out tasks including brushing teeth, combing hair, washing dishes, making the bed, and arranging books. Mobile apps provide great promise in the technology-driven world of today to assist informal home-based education using organised digital resources. Still, there is a clear vacuum in educational technology, especially in teaching kids everyday routines and promoting parent-child meaningful cooperation. This paper intends to conceptualise and create a mobile app parents can use to teach and guide their children in finishing domestic duties. The creation of this app emphasises developing self-management abilities in youngsters between the ages of five and twelve. The major goal is to create a digital platform enabling parents to assign and track home chores done by their children while also investigating reward systems to boost children's drive to complete these chores. With a needs analysis anchored in a literature review, informal observations of family interactions, and an examination of current app designs, the project uses a design-based research (DBR) and user-centred design (UCD) methodology. Modular elements including classified task lists, a reward system, and a split dashboard for parents were created using this method. Early results from the design phase indicate that mobile environments combining graphics, activity types, and organised rewards can improve children's motivation and participation in domestic tasks. Ultimately, the early growth of self-management abilities in youngsters shows how mobile technology may help informal, home-based education, foster autonomy, and increase family participation.

Keywords:
Self-Management Skills, Children, Mobile Technology, Design-Driven.

PARALLEL SESSIONS

ROOM 2 > Cybersecurity and Risk Management

(Training Hall - 2)

PRESENTATION SCHEDULE

Track : Cybersecurity and Risk Management in the Digital Age

Moderator : Dr. Ahmed Mahfouz

Time	Paper ID	Title	Presenter(s)
2.00-2.20 pm	T003	Prioritizing Cybersecurity Factors in Omani Higher Education: Insights from the Fuzzy Delphi Method.	Ali Mohammed Ali Alwahaibi
2.20-2.40 pm	M003	Exploring the Factors of Employee Turnover Intention in Oman's Construction Companies: Validity and Reliability Analysis.	Abdallah Khalfan Alrushadi
2.40-3.00 pm	T018	Digital Forensics and Investigation Framework for Industrial IoT (IIoT) Systems.	Buthaina Al-Zadjali
3.00-3.20 pm	T032	Mobile Spam and Scam Control Centre.	Rayana Abdul Rahman and Shaikh Harun Mustafa
3.20-3.40 pm	T017	Employee Behavior and Risk Mitigation in Cybersecurity for Omani SMEs.	Fahad Abdullah Saif Al Abri
3.40-4.00 pm	T012	A Cybersecurity Risk Assessment Framework for Higher Education Institutions to Identify, Analyze and Mitigate Cyber Threats.	Ravindra R Dharamshi
4.00-4.20 pm	T023	A Review of Block Cipher Based on Cryptography in Cybersecurity.	Kamsiah Mohamed
4.20-4.40 pm	T038	Enhancing Cybersecurity Through AI-Powered Biometric Authentication: A BioID Approach.	Mohd Noor Rizal
4.40-5.00 pm	T047	Unveiling the Human Element in Security - A Disturbing Surge of Social Engineering Attacks Targeting the Financial Sector.	Abdullah Ramli

T003

Title:

Prioritizing Cybersecurity Factors in Omani Higher Education: Insights from the Fuzzy Delphi Method

Authors:
Ali Mohammed Ali Alwahaibi, Wan Azlan Wan Hassan, Latifah Abd Latib and Mohammed Almamari

Abstract:
The increasing reliance on digital tools in higher education has opened new doors for innovation and learning, but it has also brought serious cybersecurity risks. For institutions in Oman, these challenges are especially complex due to evolving cyber threats and the growing demands on their digital infrastructure. This makes it crucial to figure out which factors matter most for improving information security and keeping sensitive data safe. In this study, 16 cybersecurity experts came together to help us prioritize these key factors. Using the Fuzzy Delphi Method—a process that ensures diverse expert opinions are fairly evaluated—the study focused on 16 factors that could significantly enhance security practices. Among the most important were Governance and Policy Enforcement, Security Awareness and Training, Continuous Monitoring and Risk Assessment, Stakeholder Collaboration, and Adoption of International Standards. Other crucial elements included incident response preparedness, data classification and access control, and business continuity planning. These findings offer practical steps for strengthening cybersecurity in higher education. They highlight the need for a balanced approach—combining technology, governance, and collaboration with a focus on people and processes. Working together and continuously monitoring risks can help institutions stay secure and compliant. Future research should focus on how these factors can be implemented in practice and what long-term benefits they can bring to keeping institutions safe.

Keywords:
Fuzzy Delphi Method (FDM), Cybersecurity Compliance, Information Security Governance, Risk Assessment, Higher Education Institutions (HEIs).

M003

Title:

Exploring the Factors of Employee Turnover Intention in Oman's Construction Companies: Validity and Reliability Analysis

Authors:
Abdallah Khalfan Alrushadi. Kamisah Supian and Nor Azah Jahari

Abstract:
Employee turnover remains a significant challenge in Oman's construction sector, impacting project stability and workforce sustainability. This study investigates the key factors influencing turnover intention, focusing on perceived talent management practices, work engagement, and career adaptability. A quantitative, cross-sectional approach was employed, with data collected from 30 respondents across construction companies in Oman through structured surveys. Construct validity was tested using Pearson correlation analysis, while reliability was assessed through Cronbach's Alpha (α), demonstrating strong internal consistency across all constructs. The findings confirmed that perceived talent management practices (α = 0.944), work engagement (α = 0.960), and career adaptability (α = 0.984) significantly influence turnover intention. Employees with higher levels of work engagement and career adaptability exhibited lower turnover rates, emphasizing the importance of structured talent management strategies, employee engagement programs, and career adaptability initiatives. Additionally, the study highlights key demographic insights, revealing that 92% of respondents were male, 56% were non-Omani, and most held supervisory (28%) or engineering (24%) roles. These demographic characteristics provide further context for understanding turnover dynamics in Oman's construction sector. This research provides empirical insights into workforce retention strategies, offering valuable guidance for human resource professionals, construction firms, and policymakers. The findings align with Oman's Vision 2040, advocating for policies that support workforce sustainability and enhance organizational retention efforts.

Keywords:
Employee Turnover, Talent Management, Work Engagement, Career Adaptability, Workforce Retention.

T018

Title:

Digital Forensics and Investigation Framework for Industrial IoT (IIoT) Systems

Authors:
Buthaina Al-Zadjali and Setyawan Widyarto

Abstract:
The increasing integration of traditional industrial systems with communication technologies in the Industrial Internet of Things (IIoT) has revolutionized industry efficiency. However, this interconnectedness exposes IIoT systems to cyber-based vulnerabilities. There is a lack of a systematic study method for IIoT forensics within existing research. This research investigates current methodologies and challenges in IIoT forensics and aims to propose innovative solutions for effective data collection, analysis, and interpretation within IIoT environments. The primary objective of this research is to propose a framework that can improve the forensic investigation process within the IoT environment. This research employs mixed methods, including a comprehensive literature review of current methods, barriers, and future directions for IoT forensic investigations. It also includes surveying IIoT systems in some organizations and devices to gain insights into their structure, data storage, communication protocols, and possible forensic obstacles. A case study will examine real-life scenarios involving IIoT systems in some organizations in Oman to understand the unique forensic obstacles auditors face. The study is intended to highlight the forensic approach to analyzing IIoT systems. It will evaluate IoT forensics tools in terms of time complexity, reliability, ease of usability, and other parameters. The research seeks to contribute to a regulatory framework for Industrial IoT Security, particularly in Oman, and raise awareness about the use of IoT systems. The anticipated outcome is a framework that improves the forensic investigation process within the IoT environment.

Keywords:
Industrial Internet of Things (IIoT), Digital Forensics, Cybersecurity, Framework, Forensic Investigation.

T032

Title:
Mobile Spam and Scam Control Centre

Authors:
Rayana Abdul Rahman and Shaikh Harun Mustafa

Abstract:
Spam and scam calls pose a significant cybersecurity threat, leading to financial fraud and eroding public trust in telecommunications. The National SPAM Call Control Centre (NSCC) – ValetShield is a strategic initiative designed to address this issue in Malaysia and the ASEAN region. Led by Valet Technology Sdn Bhd in collaboration with 1Route (USA), Nokia (Finland), and Universiti Kebangsaan Malaysia (UKM), the project integrates AI-driven fraud interception and the STIR/SHAKEN authentication framework to enhance call authentication, verification, and security enforcement. This initiative will position Malaysia as the first country in APAC to implement a centralized call monitoring and enforcement system under the Malaysian Communications and Multimedia Commission (MCMC). Additionally, it will establish Malaysia as the third global hub for call authentication, reinforcing its role in global telecom security. The project has three primary objectives: (i) Establishing the NSCC to authenticate and block fraudulent calls, (ii) Developing a Center of Excellence (CoE) and R&D hub at UKM to drive continuous technological advancements, and (iii) Deploying the system within 18 months, with full operational capability expected within 36 months. Financial projections estimate annual revenue of RM 168 million, supported by a nominal fee of RM 3.50 per subscriber per year. Investment will be allocated to technology development, operations, research, and regulatory collaborations. The NSCC – ValetShield presents a scalable and high-impact solution for strengthening telecommunications security, offering a lucrative investment opportunity with strong regulatory backing and significant expansion potential across Southeast.

Keywords:
Cybersecurity Threat, Fraud Interception, Telecommunications Security.

T017

Title:

Employee Behavior and Risk Mitigation in Cybersecurity for Omani SMEs

Authors:
Fahad Abdullah Saif Al Abri and Setyawan Widyarto

Abstract:
The rise in cyber threats faced by Small and Medium Enterprises (SMEs) due to inadequate cybersecurity measures, particularly from insufficient employee awareness, limited resources, and outdated security infrastructures, has led to financial and reputational risks. This research addresses the problem of SMEs lacking robust cybersecurity frameworks, making them vulnerable to cyberattacks. The study aims to empirically evaluate the mediating role of information security behaviour types between risk factors, threat factors, and cybersecurity effectiveness in Omani SMEs. A quantitative research approach will be employed, involving surveys to collect data on key cybersecurity variables from a sample of 372 non-managerial employees, determined using the Raosoft sample size calculation model. Data analysis will involve statistical techniques such as Structural Equation Modelling (SEM) and mediation analysis. The findings of this research are expected to provide valuable insights into how SMEs in Oman can enhance cybersecurity strategies, mitigate risks, and foster a more cyber-secure organisational culture. The study will also contribute to developing practical guidelines for SMEs to strengthen cybersecurity awareness, improve risk management strategies, and ensure long-term digital resilience. Ultimately, this research offers actionable recommendations for SMEs, policymakers, and cybersecurity practitioners to enhance cybersecurity awareness and improve risk mitigation strategies.

Keywords:
Cybersecurity, SMEs (Small and Medium Enterprises), Information Security Behaviour, Risk and Threat Factors.

T012

Title:

A Cybersecurity Risk Assessment Framework for Higher Education Institutions to Identify, Analyze, and Mitigate Cyber Threats

Authors:
Lohani Khan, Ravindra R Dharamshi and Khalil Bader Ali A

Abstract:
The digitization of higher education institutions (HEIs) has enhanced academic and administrative functions while simultaneously increasing vulnerability to cybersecurity threats, including data breaches, ransomware, phishing, and insider attacks. These threats jeopardize sensitive data, disrupt institutional operations, and undermine trust, underscoring the necessity for a systematic approach to cybersecurity risk management. This study presents a comprehensive cybersecurity risk assessment framework specifically designed for higher education institutions (HEIs), facilitating the systematic identification, evaluation, analysis, and mitigation of cybersecurity risks. The framework employs a structured, phased approach: Risk Identification, which categorizes threats and vulnerabilities through security audits, penetration testing, and stakeholder engagement, in accordance with CIS Critical Security Controls and the EDUCAUSE Higher Education Information Security Guide; Risk Assessment, which evaluates threats based on likelihood, impact, and financial consequences utilizing the FAIR Model for quantitative risk analysis and ISO/IEC 27001 for structured risk evaluation; Risk Analysis, which prioritizes risks through data-driven methodologies, employing the FAIR Model for risk quantification and CIS Controls for identifying critical security gaps; and Risk Mitigation, which implements actionable strategies such as policy enhancements, security measures, and cybersecurity training, consistent with CIS Controls, ISO/IEC 27001, and EDUCAUSE recommendations. The proposed framework seeks to strengthen resilience of academic environments, with proactive cybersecurity risk management, offering higher education institutions a systematic approach for protecting critical assets, mitigating cybersecurity risks and adopting necessary security measures.

Keywords:
Cybersecurity, Higher Education Institutions, Risk Assessment, Cyber Threats, Risk Mitigation.

T023

Title:

A Review of Block Cipher Based on Cryptography in Cybersecurity

Authors:
Kamsiah Mohamed and Mohd Nazran Mohammed Pauzi

Abstract:
With the rapid advancement of communication technologies, security has become vital to protect sensitive information from potential threats. Cryptography plays a critical role in protecting data, preventing unauthorized access, and maintaining secure communication. Cryptography requires a secure technique to ensure that the enemy is prevented while securing legitimate users gaining access to information. In cryptography, block ciphers are widely used as an essential component in computer security, information security, network security and other security applications. In particular, block ciphers incorporating Substitution Box (S-Box) structures enhance encryption robustness by introducing non-linearity and confusion. However, existing encryption methods face significant challenges, including computational overhead, key management complexities, and vulnerabilities to advanced cryptanalysis techniques. Thus, this paper reviews the significance of block ciphers in cybersecurity, focusing on their structural design, operational principles, and effectiveness in mitigating various attacks. In addition, this paper highlights the challenges associated with implementing block cipher mechanisms and explores future advancements to address emerging security threats. As a result, by providing a comprehensive analysis of block cipher cryptography, this study aims to contribute to the development of more resilient and efficient cryptographic frameworks in the evolving digital transformation.

Keywords:
Block Cipher, Cryptography, Cybersecurity, Digital Transformation, S-Box.

T038

Title:

Enhancing Cybersecurity Through AI-Powered Biometric Authentication: A BioID Approach

Authors:
Mohd Noor Rizal Arbain, Abdullah Ramli and Zuraidy Adnan

Abstract:
The emergence of cyber threats such as deepfake fraud, identity theft, and AI-driven attacks has made the cybersecurity landscape increasingly complex. Traditional authentication methods like passwords and PINs are often vulnerable to breaches, thus advanced authentication techniques are highly necessary. This study explores the potential of BioID, a biometric authentication solution leveraging AI technology, including facial recognition, liveness detection, and deepfake detection. The research focuses on integrating BioID within current cybersecurity strategies, specifically in fraud prevention and multi-factor authentication (MFA). Through a detailed literature review and comparative analysis, the performance of BioID is evaluated against conventional authentication techniques. The findings indicate that BioID's biometric system offers enhanced protection against identity fraud. However, data privacy issues and regulatory compliance need addressing to ensure broader adoption. Future research is recommended to further improve AI-based biometric systems while maintaining user data security. With continuously evolving cyber threats, AI-powered biometric authentication such as BioID is expected to play a crucial role in safeguarding digital identities globally.

Keywords:
Biometrics, Deepfake Detection, Identity Verification, Multi-Factor Authentication, AI-Driven.

T047

Title:

Unveiling the Human Element in Security – A Disturbing Surge of Social Engineering Attacks Targeting the Financial Sector

Authors:
K. R. Ram, M.T. Hamid, M.A.A Abdul Rahim and AB Ramli

Abstract:
This research paper presents a systematic literature study aimed at delving into the alarming rise of social engineering attacks within the financial sector. As financial institutions increasingly rely on digital technologies to streamline operations and deliver services, they have become prime targets for cybercriminals employing social engineering tactics. Social engineering has emerged as a predominant cybersecurity threat, exploiting the human element to breach otherwise robust defence systems. The objective of this study is to shed light on the various aspects of social engineering attacks, their tactics, impacts, and potential countermeasures. Through a comprehensive examination of existing literature, this research paper enhances the understanding of the human element in financial sector security. By uncovering the dynamics of social engineering attacks and their potential ramifications, stakeholders in the financial industry can develop proactive strategies to fortify their defences against this rising cybersecurity threat. This research paper contributes to the ongoing discourse on information security management and calls for greater attention to the human factor in safeguarding critical assets within the financial domain.

Keywords:
Social Engineering, Financial Sector, Cybersecurity Threat.

PARALLEL SESSIONS

ROOM 3 > Emerging Technologies in Digital Transformation

(FCS Meeting Room)

PRESENTATION SCHEDULE

Track : Emerging Technologies in Digital Transformation

Moderator : Dr. Rawad Abdulghafor and Dr. Yousuf Al Husaini

Time	Paper ID	Title	Presenter(s)
2.00-2.20 pm	T021	Shaping Society in the Age of Intelligence: Assessing the Ethical Impacts of AI Advancements.	Khairil Bariyyah Hassan
2.20-2.40 pm	T031	Enhancing Digital Picture Books for Inclusive Education: Strengthening IT for Creativity, Accessibility, and Engagement.	Latifah Abd Latib
2.40-3.00 pm	T010	Blockchain and AI Integration in Educational Certificate Validation: Issues and Challenges.	Fatma Alshuhaimi
3.00-3.20 pm	T019	The Future of AI: ABLE's (A Beautiful Lovely Engine) Vision for a More Human-Centric Approach.	Rasidah Sardi
3.20-3.40 pm	T020	AI-Generated Hyper-Realistic Content: Advancements, Challenges and Future Implications.	Norhayati Mohd Amin
3.40-4.00 pm	T030	Reimagining Educational Business Models: A Review of AI, Gamification and Digital Economy Integrations.	Rosnita A Rahaman
4.00-4.20 pm	T035	Harnessing AI for Innovation Management in Malaysian SMEs: Overcoming Adoption Challenges and Enhancing Performance in the Digital Era.	Yati Ashikin Abdul Wahab
4.20-4.40 pm	T036	AI and Human Security: Ethics, and the Social Contract in Malaysia Context.	Aida Zulaikha Zulkefly
4.40-5.00 pm	T042	The Influence of AI Towards University Student's Learning Experience.	Azira Azlin Shaharuddin
5.00-5.20 pm	T045	The Role of AI in Software Engineering Project: User Perceptive.	Nur Razia Mohd Suradi

T021

Title:

Shaping Society in the Age of Intelligence: Assessing the Ethical Impacts of AI Advancements

Authors:
Norzita Duriat, Muzairihana Mohd Moid, Khairil Bariyyah Hassan, Hasnur Hidayah Kamaruddin and Siti Rahayu Hassan

Abstract:
The accelerating advancements in Artificial Intelligence (AI) herald a transformative era for industries, communities, and human interactions. However, these innovations bring to light significant ethical concerns that challenge societal trust, inclusivity, and fairness. Critically examining these ethical implications is paramount in ensuring that AI serves humanity responsibly and equitably. This study offers an exploration of the intersection between AI development and societal ethics. The research employs a qualitative approach, utilizing secondary data from peer-reviewed journals, industry reports, and case studies. Through content and thematic analysis, the study evaluates the societal consequences of ethical dilemmas in AI development and implementation, investigates the impact of ethical practices on public trust and inclusivity, and examines the influence of AI ethics across various industries. By identifying patterns in ethical practices or the lack thereof, the study highlights their critical role in shaping public perception and trust in AI technologies. The findings will provide a comprehensive understanding of how ethical issues in AI affect societal outcomes while fostering inclusivity and fairness. It also provides actionable recommendations for ethical frameworks to guide industries alongside a strategic roadmap for stakeholders to mitigate negative impacts and amplify AI's positive societal contributions. By bridging the gap between innovation and responsibility, this research underscores the importance of ethical vigilance in shaping a future where AI advancements align with humanity's best interests.

Keywords:
Artificial Intelligence Ethics, Ethical Frameworks, Inclusivity and Fairness, Public Perception, Societal Trust.

T031

Title:

Enhancing Digital Picture Books for Inclusive Education: Strengthening IT for Creativity, Accessibility, and Engagement

Authors:
Latifah Abd Latib, Nor Aziyana Abd Rahman and Nurrul Huwaina Ridzuan Lotfi

Abstract:
Digital transformation is redefining education, offering new avenues to enhance learning accessibility and engagement through IT governance and digital strategy alignment. For children with disabilities, traditional educational materials often lack inclusivity, limiting their participation. This paper explores how digital picture books, supported by adaptive IT infrastructures, can address these gaps by integrating Universal Design for Learning (UDL) and Social Semiotics to create engaging, multimodal learning experiences. By leveraging cloud-based e-books, AI-driven personalization, interactive multimedia, and assistive technologies, digital picture books can accommodate diverse cognitive and sensory needs, making learning more dynamic and accessible. Social Semiotics further informs content design, ensuring that environmental education themes, such as sustainability, are effectively communicated through meaningful visual and textual elements. Augmented Reality (AR), AI-powered content adaptation, and adaptive interfaces enhance interactivity, transforming picture books into immersive educational tools. This study highlights how strategic IT implementation can redefine accessibility in education, creating a digitally inclusive ecosystem that ensures equitable learning opportunities. By integrating robust IT governance frameworks, digital picture books become powerful tools for fostering creativity, engagement, and knowledge retention. This paper contributes to the ongoing discourse on IT-driven educational innovations, advocating for a future where technology-driven learning environments empower all students, particularly those with disabilities, ensuring lifelong learning and social empowerment.

Keywords:
Digital Education, IT Governance, Inclusive Learning, Assistive Technology, Multimedia Engagement.

T010

Title:

Blockchain and AI Integration in Educational Certificate Validation: Issues and Challenges

Authors:
Fatma Alshuhaimi, Wan Azlan Wan Hassan and Latifah Abd Latib

Abstract:
Integrating blockchain technology with artificial intelligence (AI) offers a transformative approach to educational certificate validation, effectively addressing challenges such as fraud, inefficiency, and data security. Blockchain provides a decentralized, immutable ledger for secure certificate storage, while smart contracts automate verification processes. Concurrently, AI enhances validation through techniques like Optical Character Recognition (OCR) for digitizing certificates and machine learning for detecting anomalies and preventing forgery. However, integrating these technologies presents significant challenges. Technical complexities arise from the need for seamless interaction between AI models and blockchain protocols. Scalability issues, especially on public blockchain networks, can create bottlenecks in high-volume verification processes. Additionally, data privacy concerns emerge when storing sensitive educational records on immutable ledgers. The absence of standardization across digital certification formats and the high cost of implementation further complicate integration efforts. This study reviews the latest research and real-world use cases to identify these challenges and analyse the technical and operational barriers to successful integration. The findings highlight critical obstacles that must be addressed to fully realize the potential of blockchain and AI in secure, efficient educational credentialing.

Keywords:
Blockchain, Smart Contracts, Artificial Intelligence, Certificate Validation, Educational Technology Challenges.

T019

Title:

The Future of AI: ABLE's (A Beautiful Lovely Engine) Vision for a More Human-Centric Approach

Authors:
Muhamad Muzzaffar Shah Mohd Esa, Rasidah Sardi and Faudzi Ahmad

Abstract:
In the rapidly evolving domain of Artificial Intelligence (AI), Project ABLE—"A Beautiful Lovely Engine"—aims to enhance user interactions through an emotionally resonant and aesthetically appealing AI system. Current AI models often lack emotional depth and struggle to provide engaging user experiences. ABLE is designed to address these limitations by incorporating emotional intelligence, intuitive responses, and multimodal capabilities. Developed using the Rapid Application Development (RAD) methodology, ABLE follows structured phases: Requirements Planning, User Design, Rapid Construction, and Cutover. This study involved quantitative data collection through user surveys to evaluate AI engagement and preferences. Results indicate a strong preference for emotionally intuitive AI interactions, with respondents favouring creativity and multimodal functionalities. Despite its potential, ABLE faces challenges related to computational resources, user acceptance, and ethical concerns. This research contributes to the field of AI-driven emotional computing, emphasizing the integration of aesthetics and human-centric engagement in AI development.

Keywords:
Artificial Intelligence, Emotional Intelligence, Human-Centric AI, Intelligent Systems, Rapid Application Development.

T020

Title:

AI-Generated Hyper-Realistic Content: Advancements, Challenges and Future Implications

Authors:
Norhayati Mohd Amin, Norazlina Hanim Shamsudin, Hasnur Hidayah Kamaruddin, Norami Mastura Abdul Halim and Azlin Ramli

Abstract:
AI-generated content is transforming digital media by enabling the creation of highly realistic images, videos, text, and audio. Advanced computational techniques, including data-driven synthesis and neural modelling, are unlocking new opportunities in entertainment, journalism, marketing, and gaming. However, these innovations also raise concerns regarding misinformation, intellectual property disputes, and biases in automated systems. This study examines the rapid advancement of AI-generated content, highlighting key technological developments and associated ethical, legal, and regulatory challenges. Additionally, it investigates emerging frameworks for promoting ethical AI and responsible content creation. The paper reviews existing literature, case studies, and recent developments in AI-driven media. It assesses the capabilities of modern computational models, legal and ethical debates, and potential solutions like digital watermarking and content verification techniques. Findings indicate that while AI-generated content offers significant creative benefits, it also presents risks such as deepfake misuse, biased outputs, and legal uncertainties regarding ownership. Regulatory approaches, including blockchain verification and authenticity tracking, are emerging as safeguards to enhance transparency and accountability. AI-generated content has immense potential, but responsible oversight is essential to prevent misuse. A balance between technological innovation and ethical AI practices is crucial to ensuring a secure and trustworthy digital media landscape. Future research should focus on governance, fairness, and content verification to mitigate associated risks.

Keywords:
AI-Generated Content, Ethical AI, Digital Media Regulation, Content Verification.

T030

Title:

Reimagining Educational Business Models: A Review of AI, Gamification and Digital Economy Integrations

Authors:
Rosnita A Rahaman, Marliza Abdul Malik, Suhaimi Mohd Noor, Muhammad Azizi Azhar, Norhayati Mohd Amin, Salyani Osman and Norazimah Awang

Abstract:
The integration of Artificial Intelligence (AI), gamification, and digital economy platforms is revolutionizing the face of education through new ways to enhance learner motivation, engagement and achievement. This review critically examines how these technologies intersect to create dynamic, adaptive and rewarding learning experiences. AI enables personalized learning paths through data-driven insights and adaptive feedback systems, while gamification applies game design principles to generate motivation, competition and collaboration among learners. By way of contrast, virtual economy platforms offer new types of value exchange, compensation for involvement, achievement and skill acquisition in the form of digital currencies or rewards. Together, these elements offer a strong foundation for creating interesting and meaningful learning environments. This paper synthesizes current research, case studies and real-world applications to highlight the benefits, drawbacks and best practices of applying these technologies in learning settings. Ethical issues, technology accessibility, data privacy and demands for sustainable engagement approach are some of the key considerations. The intentional combination of AI, gamification and digital economy mechanisms can potentially drive more profound learning outcomes, cultivate lifelong learning habits and prepare students better for future digital economies. This review aims to provide educators, developers with strategic information for effective use of these technologies in transforming education into an interactive, personalized and balanced experience.

Keywords:
Artificial Intelligence, Gamification, Digital Economy, Educational Technology, Personalized Learning, Game-Based Learning, Adaptive Learning Systems, Learning Motivation.

T035

Title:

Harnessing AI for Innovation Management in Malaysian SMEs: Overcoming Adoption Challenges and Enhancing Performance in the Digital Era

Authors:
Yati Ashikin Abdul Wahab, Siti Hawa Mohd Yusoff, Nasrudin Md Rahim, Shahida Abd Latif, Hanita Hashim and Azman Ariffin

Abstract:
As Malaysia accelerates its transition towards a digital economy, the integration of Artificial Intelligence (AI) into innovation management processes has emerged as a critical enabler for competitiveness and sustainable growth. However, despite national policies promoting Industry 4.0 and digital transformation, many Malaysian organizations particularly small and medium-sized enterprises (SMEs) continue to face significant barriers in adopting AI technologies effectively. This study investigates the current state of AI-driven innovation management in Malaysia by identifying key adoption barriers, assessing organizational readiness, and evaluating the impact of AI integration on innovation performance. Using a cross-sectional survey of 210 organizations across multiple sectors, the research applies a structured quantitative methodology, including descriptive statistics, reliability testing (Cronbach's alpha), exploratory factor analysis (EFA), correlation analysis, and multiple linear regression. The findings reveal that the most prominent barriers to AI adoption include limited technical expertise, high implementation costs, lack of strategic alignment, and insufficient government incentives. Moreover, regression analysis indicates that AI adoption positively correlates with innovation performance, particularly in areas such as new product development, process optimization, and market responsiveness provided that firms possess adequate digital infrastructure and human capital readiness. The study offers practical insights for policymakers, business leaders, and innovation managers by highlighting critical success factors for AI integration in innovation processes. It also emphasizes the need for collaborative strategies involving public-private partnerships, targeted upskilling programs, and sector-specific AI frameworks to bridge the digital divide. Ultimately, this research contributes to a deeper understanding of how AI can be leveraged to close performance gaps and drive transformative innovation in Malaysia's evolving digital landscape.

Keywords:
AI Adoption Barriers, Organization Readiness, SME's.

T036

Title:

AI and Human Security: Ethics, and the Social Contract in Malaysia Context

Authors:
Aida Zulaikha Zulkefly, Aisya Khadijah Mohd Hamidi, Sheril Nurelysa Marhalim, Dewi Dermawan Elmi and Bashahriyah Bakar

Abstract:
As artificial intelligence (AI) becomes increasingly embedded in governance and security infrastructures, it is reshaping the contours of human security and challenging traditional understandings of the social contract. It has become an essential tool in daily use. Yet with this, there will also come some issues concerning security. Drawing on social science perspectives and critical security studies, the study interrogates how AI systems affect individual rights, state-citizen relations, and public trust in an ethnically diverse and politically dynamic society. In Malaysia, the context highlights broader global concerns: the tension between innovation and rights, protection and control, and efficiency and ethics. In the digital social contract—one that centres on democratic governance, equitable access, and the ethical use of AI to ensure that technological progress does not come at the cost of human dignity with the used of application such as MySejahtera, Selangkah,PADU and etc. This paper critically examines the implications of AI-driven technologies—such as facial recognition, predictive policing, and digital health surveillance—on human security in Malaysia.

Keywords:
Artificial Intelligence, Malaysia, Governance, Ethics.

T042

Title:

The Influence of AI Towards University Student's Learning Experience

Authors:
Nuraisha Yasmeen Kamarul Azmi, Azira Azlin Shaharuddin, Mohd Khalil Sreedaran Abdullah and Munirah Ilias

Abstract:
The rapid advancement of Artificial Intelligence (AI) technologies is transforming educational landscapes by offering personalized learning experiences and academic support for students. This study investigates the influence of AI tools on the learning experiences of students at the University of Selangor (UNISEL). The primary objectives of this research were to identify the types of AI tools used by UNISEL students, assess their usage frequency, and analyse the perceived effects of these tools on students' academic performance and learning experiences. A quantitative research approach was adopted, employing questionnaires distributed to 300 students at UNISEL's Bestari Jaya campus. The data collected were analysed using IBM SPSS for statistical insights. Findings revealed that popular AI tools such as ChatGPT, QuillBot, and Google Scholar significantly aid students in completing assignments, conducting research, and managing their time effectively. The analysis indicated a positive correlation between the frequency of AI tool usage and improvements in academic performance and motivation among students. The study underscores the significant role that AI tools play in enhancing the learning experiences of students at the University of Selangor. The data indicate that these tools not only facilitate academic tasks but also actively contribute to improving students' motivation, academic performance, and overall engagement in their studies. Ultimately, the research contributes to the growing discourse on AI in education, advocating for an adaptive framework that embraces technological advancements while maintaining the integrity of the learning process.

Keywords:
Artificial Intelligence, Higher Education, Learning Experience, AI Tools.

T045

Title:

The Role of AI in Software Engineering Project: User Perceptive

Authors:
Nur Razia Mohd Suradi, Marina Hassan, Rahayu Handan and Nik Nordiana Nik Ab Rahman

Abstract:
The fast progression of artificial intelligence (AI) in the current era makes it one of the vital focuses in many applications, including in the software engineering domain. A software engineering project basically consists of step-by-step implementation from requirement gathering, design, construction of the application, testing, and finally the deployment of the product. Examples of AI-driven automation, smart code formation, intelligent software maintenance, and self-learning systems will alter traditional software development concepts, presenting them as more efficient and cost-effective. However, there are challenges that need to be addressed before automation software engineering can be implemented. This research aims to investigate the user perception on how the integration of AI can influence the current practice in product development, the challenges in AI implementation, and the suggestions contributing to successful AI. A survey is employed to gather data from the user via an online platform. Thus, the research will provide valuable insights into how the future of software engineering projects will be portrayed via AI-human collaboration in maintaining robust and resilient software systems.

Keywords:
Artificial Intelligence, AI, Software Engineering, Resilient Software.

PARALLEL SESSIONS

ROOM 4 > IT Governance and Data Driven Innovation

(BUS Meeting Room)

PRESENTATION SCHEDULE

Track : - Cloud and Data-Driven Innovation
- IT Governance and Digital Strategy Alignment

Moderator : Dr. Wasin Al Kishri and Dr. Mahmood Al Bahri

Time	Paper ID	Title	Presenter(s)
2.00-2.20 pm	T009	Predicting Air Pollution in Oman: A Comparative Study of Machine Learning, LSTMs, and Transformer-Based Models.	Alkishri Moosa
2.20-2.40 pm	T022	A Case Study of Strategic ICT Innovation in Two Public Research Institutes and Government Agencies in Malaysia.	Irny Suzila Ishak
2.40-3.00 pm	T007	Climate Change Prediction in Oman Using Machine Learning: A Comparison of Predictive Models.	Israa AbdulRauof Othman Ahmed
3.00-3.20 pm	T005	Barriers and Enablers in Sustainability Management of Biodegradable Food Packaging Adoption Among Food Handlers.	Mohd Fakhri Hazim Azmi
3.20-3.40 pm	T013	Comparative Analysis of Multilingual Sentiment Analysis Models on Zakat-Related Texts.	Azhar Hamid
3.40-4.00 pm	T029	Knowledge Retention Strategies in Aging Workforce Environments: A Digital Repository Approach for Higher Education Institutions (HEI).	Nik Nordiana Nik Ab Rahman
4.00-4.20 pm	T039	Unveiling the Sentiment Analysis on Halal Food Perception Tweets through Visual Analytics.	Roziyani Setik
4.20-4.40 pm	T002	Bridging the Digital Divide: Exploring the Role of Digital Engagement in Promoting Social Inclusion Among Older Adults.	Visalini Mariamuthu
4.40-5.00 pm	T033	Bridging Borders and Screens: Digital Leadership in Multilingual Remote and Hybrid Workforces.	Najmi Najiha Mohd Zaid

T009

Title:

Predicting Air Pollution in Oman: A Comparative Study of Machine Learning, LSTMs, and Transformer-Based Models

Authors:
Alkishri Moosa, Nur Syufiza Ahmad Shukor and Jabar H. Yousif

Abstract:
Air pollution is a critical environmental issue affecting public health and climate conditions worldwide. In this study, we develop and compare multiple machine learning and deep learning models to predict PM10 and PM2.5 concentrations in Oman using historical air quality and meteorological data. We evaluate traditional models such as Linear Regression (LR) and Random Forest (RF) alongside deep learning approaches, including Long Short-Term Memory (LSTM) networks, CNN-LSTM hybrids, Artificial Neural Networks (ANNs), Deep ANN, and Transformer-based models. Our results indicate that the CNN-LSTM hybrid model outperforms all others, achieving the highest predictive accuracy with an R^2 of 0.76 and the lowest RMSE of 24.10, demonstrating its effectiveness in capturing both short-term variations and long-term dependencies in air pollution data. Additionally, we explore Graph Neural Networks (GNNs) and Physics-Informed Neural Networks (PINNs) to assess their potential in incorporating spatial and domain-specific knowledge into the predictive framework. These findings highlight the importance of deep learning architectures in air quality forecasting and offer valuable insights for policymakers and environmental agencies in developing data-driven pollution mitigation strategies.

Keywords:
Air Pollution Prediction, Time-Series Forecasting, Machine Learning, Environmental Modeling.

T022

Title:

A Case Study of Strategic ICT Innovation in Two Public Research Institutes and Government Agencies in Malaysia

Authors:
Irny Suzila Ishak, Nik Nordiana Nik Ab Rahman, Rahayu Handan, Izwan Suhadak Ishak and Shireen Muhammad

Abstract:
This article examines the strategic innovation of Information and Communication Technology (ICT) within two Public Research Institutes (PRI) and government agencies in Malaysia. The two PRI have implemented strategic ICT innovation to enhance the organizational efficiency, effectiveness, and competitiveness. Using a case study methodology, this research employs interviews, document analysis and observation to explore the factors contributing to their success in the implementation of ICT innovation strategies in PRI and government agencies in Malaysia and identifies key lessons for other research institutes. The findings indicate that innovation culture, organizational ICT management structure that stimulates innovation, critical success factors and characteristics of successful ICT strategic planning implementation that generate ICT strategies to support innovation, methods and guidelines for ICT strategic planning, contributors of innovative ideas, innovation idea catalysts, and strategic ICT applications that stimulate innovation are the components and attributes of ICT strategic planning that stimulate innovation. This article offers insights into best practices and recommendations on the ICT strategic planning attributes that stimulate innovation.

Keywords:
ICT Innovation, Strategic ICT Planning, Public Research Institutes, Government Agencies, Malaysia, Innovation Stimulation.

T007

Title:

Climate Change Prediction in Oman Using Machine Learning: A Comparison of Predictive Models

Authors:
Adeeb Khan Lohani, Israa Ahmed, Khalil Al Ruqeishi and Kamal Yaseen

Abstract:
Extreme weather occurrences, such as dust storms, flash floods, and rising temperatures, are becoming more frequent in the Sultanate of Oman, making sophisticated climate forecasting models necessary. Rapid and complicated climatic changes are difficult for traditional methods to capture, which emphasizes the need for data-driven approaches. In order to improve early climate adaptation measures, this study investigates machine learning techniques by determining which model is most accurate in forecasting temperature extremes, precipitation variations, and severe weather events in Oman. The study evaluates the prediction capabilities of Long Short-Term Memory Networks (LSTM), Random Forest (RF), Support Vector Machines (SVM), and Linear Regression (LR) in order to identify the best model. To simulate climatic fluctuations, synthetic climate datasets will be employed, which will include historical climate data, socio-economic indicators, and variables collected from satellites. Techniques for feature selection and data normalization will improve the quality of the data and guarantee accurate forecasts. To ascertain which model has the highest predictive capabilities, each will be evaluated using accuracy, precision, recall, F1-score, mean absolute error (MAE), and root mean squared error (RMSE). While RF and SVM may still be useful for short-term forecasting, deep learning models—in particular, LSTM—are anticipated to perform better than conventional models by capturing complicated non-linear climatic fluctuations and long-term relationships. The results will help policymakers, academics, and disaster management organizations make data-driven decisions by offering crucial insights into machine learning's role in climate adaptation. To further improve the accuracy of climate predictions, future studies will investigate hybrid machine learning approaches, real-time meteorological data integration, and larger datasets.

Keywords:
Machine Learning, Climate Prediction Models, Predictive Performance Evaluation, Climate Adaptation Strategy.

T005

Title:

Barriers and Enablers in Sustainability Management of Biodegradable Food Packaging Adoption Among Food Handlers

Authors:
Mohd Fakhri Hazim Azmi, Siti Hawa Mohd Yusoff, Nasrudin Md Rahim, Yati Ashikin Abdul Wahab, Shahida Abd Latif, Hanita Hashim and Azman Ariffin

Abstract:
The Malaysian government has actively promoted the transition to environmentally friendly products, including biodegradable food packaging, as part of the Malaysia Roadmap Towards Zero Single-Use Plastics 2018-2030. However, despite various campaigns, food handlers' adoption of biodegradable packaging remains limited due to low awareness and mixed perceptions. This study examines the barriers and enablers influencing the adoption and sustainability management of biodegradable food packaging among food handlers. Key factors explored include food handlers' awareness, environmental concern, community practices, perceived value, and government support. A qualitative research approach will be employed through in-depth interviews with food handlers in Selangor, Malaysia. Thematic analysis using NVivo software will be conducted to identify key themes related to their perceptions, challenges, and decision-making processes regarding biodegradable packaging adoption. Preliminary findings suggest that while food handlers recognize the benefits of biodegradable packaging, adoption is hindered by economic concerns, limited waste management infrastructure, and skepticism about environmental claims. Conversely, enablers such as increased awareness, financial incentives, and strong government support can enhance adoption. Biodegradable food packaging presents a viable solution to plastic pollution, but its successful implementation requires addressing economic, informational, and logistical barriers. Strengthening sustainability management efforts, including education, policy incentives, and infrastructure improvements, can facilitate wider adoption among food handlers and contribute to more sustainable food packaging practices in the industry.

Keywords:
Biodegradable Food Packaging, Environmental Awareness, Food Handlers, Sustainable Packaging Adoption, Sustainability Management.

T013

Title:

Comparative Analysis of Multilingual Sentiment Analysis Models on Zakat-Related Texts

Authors:
Azhar Hamid, Wan Azlan Wan Hassan, Latifah Abd Latib and Raja Mohd Tariqi Raja Lope Ahmad

Abstract:
Sentiment analysis is crucial for understanding public perception of Zakat institutions, influencing decision-making and improving services. However, analyzing sentiments in multiple languages, particularly English and Malay, presents challenges due to linguistic variations and contextual differences. Selecting an effective multilingual sentiment analysis model is essential for accurate classification and insight extraction. This study compares the performance of three multilingual sentiment analysis models—mBERT, DistilBERT, and XLM-RoBERTa (XLM-R)—on Zakat-related texts in English and Malay. The objective is to identify the most effective model for sentiment classification and examine the impact of language-specific characteristics on model accuracy. A dataset of Zakat-related texts was collected from social media, forums, and news articles in both languages. The data underwent preprocessing, including tokenization, normalization, and stopword removal, to ensure consistency. The three models—mBERT, DistilBERT, and XLM-R—were fine-tuned and evaluated using precision, recall, F1-score, and accuracy metrics. Results indicate that XLM-R outperforms the other models in overall sentiment classification, followed by mBERT and DistilBERT. Performance was higher for English texts, likely due to the availability of more training data and simpler linguistic structures. Malay texts posed challenges due to morphological complexity and contextual nuances, impacting model accuracy. This study provides insights into the optimal model for multilingual sentiment analysis of Zakat-related texts. The findings can assist Zakat institutions in enhancing public engagement and sentiment monitoring, with implications for Islamic finance and social welfare. Future research may explore hybrid approaches to improve classification accuracy across languages.

Keywords:
Sentiment Analysis, Multilingual NLP, Zakat Institutions, mBERT, XLM-RoBERTa, DistilBERT.

T029

Title:

Knowledge Retention Strategies in Aging Workforce Environments: A Digital Repository Approach for Higher Education Institutions (HEI)

Authors:
Nik Nordiana Nik Ab Rahman, Norhawani Ahmad Teridi and Nur Razia Mohd Suradi

Abstract:
This article explores knowledge retention strategies designed for the aging workforce environment and experts leaving the Higher Education Institutions (HEIs). As experienced academic staff approach retirement or staff leave the institutions for some reasons, HEIs confront the challenges of protecting institutional knowledge, which frequently remains tacit and undocumented. It highlights the significance of digital repositories as a viable and sustainable solution. This study proposes a digital repository aimed at capturing, organizing and disseminating critical knowledge assets across departments. Through case studies, this article focuses on how digital repositories can facilitate knowledge continuity, enhance learning organizations, and mitigate the loss of expertise that contributes to enhancing decision making processes and fostering long term institutional resilience.

Keywords:
Knowledge Retention, Digital Repository, Knowledge Assets, Knowledge Continuity.

T039

Title:

Unveiling the Sentiment Analysis on Halal Food Perception Tweets through Visual Analytics

Authors:
Roziyani Setik, Irny Suzila Ishak, Wan Azlan Wan Hassan, Salyani Osman, Suziyanti Marjudi and Siti Fairuz Nurr Sadikan

Abstract:
This research integrates sentiment analysis, the Theory of Planned Behavior (TPB), and advanced machine learning techniques to examine consumer behavior and perceptions surrounding halal food. Focusing on Malaysia's halal food landscape, the study addresses the growing demand for understanding public sentiment and behavior in a market influenced by cultural, religious, and social factors. Using 3,000 tweet posts tagged with #halal, the study develops a dataset preprocessed through Natural Language Processing (NLP) tools, including BERT and Malaya, to classify sentiments as positive, negative, or neutral. Aspect-Based Extraction identifies key attributes related to halal food, and topic modeling techniques such as BERTopic and Latent Dirichlet Allocation (LDA) uncover themes in consumer discussions. Hugging Face is utilized as the core NLP framework to implement and fine-tune machine learning models, such as BERT, for sentiment and aspect classification. Pretrained models available on Hugging Face's platform are adapted to the Malay language context, enabling precise sentiment extraction and robust classification of halal-related data. Additionally, Hugging Face's Transformers library supports advanced tokenization and language modeling, ensuring that cultural and linguistic nuances in the dataset are accurately captured. The results are visualized using Hugging Face Spaces, an environment that allows the deployment of interactive dashboards and applications for stakeholders. These dashboards provide actionable insights, such as trends in consumer sentiment, psychological drivers of halal purchasing behavior, and key discussion topics. By integrating TPB with Hugging Face-powered sentiment analysis, the study develops predictive models to anticipate purchasing decisions, offering practical applications for businesses, policymakers, and researchers. This interdisciplinary approach bridges technology and halal studies, supporting Malaysia's halal industry and addressing challenges in misinformation and consumer trust.

Keywords:
Sentiment Analysis, Theory of Planned Behavior (TPB), Malaya, Halal Food, BERT.

T002

Title:

Bridging the Digital Divide: Exploring the Role of Digital Engagement in Promoting Social Inclusion Among Older Adults

Authors:
Visalini Mariamuthu, Nur Syufiza Ahmad Shukor, Haslinda Sutan Ahmad Nawi, Siti Fatimah Omar, Nahdatul Akma Ahmad and Az Athirah Zubairi

Abstract:
Digital engagement has become increasingly essential in today's digital landscape, playing a pivotal role in fostering social inclusion. Individuals who lack digital skills face the risk of being both digitally and socially ostracized, with older adults experiencing significant disadvantages in this context. This research study aims to investigate the extent of digital engagement among older adults and its effectiveness in promoting social inclusion within society. Our initial findings indicate that digital engagement provides numerous benefits for the elderly, including reduced isolation, increased autonomy, enhanced independence, and improved health outcomes. A systematic literature search using Mendeley and Google Scholar identified 25 relevant studies published between 2005 and 2024 that address digital engagement, social inclusion, and older adults. From these studies, we extracted six key themes: social inclusion; older adults; digital engagement; social inclusion and older adults; digital engagement and older adults; and their intersections. Utilizing the PRISMA framework for extracting, analyzing, and reporting data, our analysis reveals that a significant number of older individuals remain excluded from digital engagement, which adversely affects their social inclusion. This paper recommends further in-depth research to explore the active participation of older adults in digital engagement and to develop targeted solutions that enhance their inclusion in the digital landscape, ultimately promoting greater social connectivity and well-being for this demographic.

Keywords:
Digital Engagement, Older Adult, Social Inclusion.

T033

Title:

Bridging Borders and Screens: Digital Leadership in Multilingual Remote and Hybrid Workforces

Authors:
Norzita Duriat, Marina Mohamad Amir, Nurul Adawiyah Mohamad Johdi, Wan Hazwani Wan Hamedi, Nur 'Izzah Mohammad Shuhaimi, Ai'syah Abd Mutalib and Najmi Najiha Mohd Zaid

Abstract:
The rapid evolution of remote and hybrid workforces, driven by advancements in technology and global connectivity, has transformed leadership dynamics in virtual environments. Digital leaders are confronted with unique challenges, including cross-cultural communication barriers and fostering collaboration among multilingual teams. This research focuses on exploring the intersection of technology and leadership to address these complexities, with an emphasis on the impact of digital tools in managing diverse workforces. Through a mixed-methods approach combining literature reviews and survey data from English and non-native English-speaking professionals, the study evaluates the efficacy of digital communication platforms, such as video conferencing tools, AI-driven translation technologies, and collaborative software in bridging language gaps and promoting inclusivity. Furthermore, it aims to identify practical leadership strategies that leverage technology to enhance productivity and cross-cultural collaboration in remote and hybrid settings. By examining the role of technology as both a challenge and a solution, this research provides actionable insights and recommendations for organizations striving to build efficient, inclusive, and digitally connected workplaces. The findings are intended to advance the digital leadership discourse by highlighting technology's transformative impact on global workforce management and setting a foundation for future innovation in this field.

Keywords:
Cross-Cultural Communication, Digital Leadership, Hybrid Workforces, Multilingual Teams/Speakers, Remote Workforces.

PARALLEL SESSIONS

ROOM 5 > Emerging Applications and Digital Infrastructure
(Academic Meeting Room)

PRESENTATION SCHEDULE

Track : - Digital Infrastructure for the Future
- Emerging Applications and Technologies

Moderator : Dr. Laila Abdellatif and Dr. Mohammad Abrar

Time	Paper ID	Title	Presenter(s)
2.00-2.20 pm	T034	Elderly Social Inclusion in the Digital Age: A Systematic Review.	Nur Syufiza Ahmad Shukor
2.20-2.40 pm	T008	Implementation Challenges and Issues in Smart Contract-Based Blockchain: A Literature Review with Insights from Oman Stakeholders.	Jokha Bani Saad
2.40-3.00 pm	T016	Developing Preliminary E-Textbook Design Model.	Nabawiya Khamis Juma Almasuudi
3.00-3.20 pm	T024	Laravel Framework Implementation for Sustainable Application: Student Information System (SIS) in Higher Learning Institution (IHL).	Nur Razia Mohd Suradi
3.20-3.40 pm	M001	The Effect of Operation Readiness and Maintenance Planning on Operation Performance in Offshore Facility.	Syarizan Ishak
3.40-4.00 pm	T041	Evolving with The Times: Physical Libraries in the Digital Era.	Nora Lina Mohd Hussain
4.00-4.20 pm	T001	Design and Modelling of Pneumatic Trimming System for Industrial Paper Production.	Hui Seng Low
4.20-4.40 pm	T037	The Collaborative Nature of Fashion Photography: Exploring the Synergy Between Photographers and Their Subjects with New Digital Technology.	Afendi Md Shas Md Khaled

T034

Title:

Elderly Social Inclusion in the Digital Age: A Systematic Review

Authors:
Nur Syufiza Ahmad Shukor, Guo Bo, Haslinda Sutan Ahmad Nawi, Siti Fatimah Omar and Nahdatul Akma Ahmad

Abstract:
In recent years, amidst the swift advancement of digital technology, the social inclusion of the elderly has garnered the attention of researchers throughout. This paper offers a thorough examination of the social inclusion of the elderly from 2020 to 2024, utilizing the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology to screen published papers in the Web of Science database and analyzing the selected studies to identify three distinct factors of social inclusion in older adults. This article examines the influence of digital technology on the social inclusion of elderly adults, emphasizing the obstacles they encounter in accessing online platforms and the repercussions of social isolation. The review emphasizes the intensification of loneliness and isolation among the elderly resulting from restricted digital literacy, cognitive deficits, and physical constraints that impede their engagement in the digital realm. The report underscores the necessity for focused initiatives to close the divide in digital inclusion and enhance the overall quality of life for elderly populations.

Keywords:
Digital Literacy, Cognitive Deficits, Physical Constraints, Digital Engagement.

T008

Title:

Implementation Challenges and Issues in Smart Contract-Based Blockchain: A Literature Review with Insights from Oman Stakeholders

Authors:
Jokha Bani Saad, Irny Suzila Ishak and Nur Syufiza Ahmad Shukor

Abstract:
Smart contract-based blockchain technology has emerged as a transformative solution across multiple industries, offering enhanced security, transparency, and automation. However, its implementation faces significant challenges, particularly in regions with developing digital ecosystems such as Oman. While extensive research has explored these challenges globally, there remains a gap in contextualizing these findings for Oman's unique regulatory and technological landscape. This literature review examines key challenges associated with smart contract adoption, drawing insights from existing research on blockchain implementation. The review categorizes these challenges into three dominant themes: technical limitations, regulatory gaps, and organizational barriers, each with specific implications for Oman. To complement the literature analysis, semi-structured interviews with 1–3 key stakeholders (such as financial regulators, IT governance experts, and blockchain practitioners) provide additional insights into the practical challenges and feasibility of implementing smart contracts in Omani financial institutions. By synthesizing global research with expert perspectives, this study identifies best practices and strategic recommendations to facilitate blockchain smart contract adoption in Oman, aligning with international standards and governance models. These insights offer valuable guidance for policymakers, industry stakeholders, and researchers seeking to navigate the regulatory and operational complexities of blockchain integration.

Keywords:
Blockchain, Smart Contracts, Literature Review, IT Governance, Regulatory Challenges, Stakeholder Perspectives, Digital Transformation.

T016

Title:
Developing Preliminary E-Textbook Design Model

Authors:
Setyawan Widyarto, Nabawiya Khamis Juma Almasuudi, Irny Suzila Ishak, Salyani Osman and Haslinda Sutan Ahmad Nawi

Abstract:
The rapid advancement of digital education has led to the widespread adoption of e-textbooks, offering significant benefits over printed materials. However, challenges persist regarding their usability, accessibility, and interactivity. Previous research shows that there is a lack of standardised guidelines for e-textbook design to appraise e-textbook usability and effectiveness. This literature review aims to investigate the role of instructional design (ID) models in e-textbook development and develop the preliminary e-textbook design model. The literature review and analysis are studying papers related to the current instructional design model from 2014 to 2024. The findings indicate that models such as ADDIE, SAM, Dick and Carey, and Almekhlafi Digital Interactive Content (ADIC) Model contribute to enhancing learning materials. The study highlights the need for standardized design principles to optimize learning experiences. The ADIC model, which focuses specifically on designing and developing interactive digital content, is chosen as the basis for the preliminary model due to its alignment with the study objectives. The preliminary model highlights the key design elements of an e-textbook, which consist of three main components; text, images, and layout, that work together to influence student engagement.

Keywords:
Instructional Design, E-Textbooks, Student Engagement, ADDIE, Digital Education, Usability.

T024

Title:

Laravel Framework Implementation for Sustainable Application: Student Information System (SIS) in Higher Learning Institution (IHL)

Authors:
Nur Razia Mohd Suradi, Nik Nordiana Nik Ab Rahman, Rahayu Handan and Azilayati Osman

Abstract:
The traditional methodology of web development is not adequate for the market's demands nowadays. Therefore, there are frameworks that make high-quality, large-scale project development convenient and faster. An example of an application is a student information system. The management of student data in an academic environment is a very crucial process in higher learning institutions (IHL). Student data consists of registration data, academic data, examination result data, and also graduation data. Currently, some of the academic processes are done manually. This caused the inconsistency of students data, and the data need to be updated frequently in the current application to ensure the data's consistency. Therefore, with the rapid development of information technology, there is a desire to develop existing systems using the Laravel framework to cater to this problem. This study intends to develop a web-based application utilizing the Laravel framework to accelerate and streamline the application and registration procedure for new students. This qualitative study implements a system design approach. The system design will address the problem from an object-oriented perspective and employ the PHP programming language, MSSQL as the database processor, and the Laravel framework as the primary technology. To ensure the system produced is high-quality, testing is done thoroughly using the test scripts developed for the specific module.

Keywords:
Academic, Higher Learning, Laravel, Web-Based.

M001

Title:

The Effect of Operation Readiness and Maintenance Planning on Operation Performance in Offshore Facilities

Authors:
Syarizan Ishak and Zaharuzaman Jamaluddin

Abstract:
Operation readiness and maintenance planning efficiency of gas turbine packages in offshore oil and gas production environments are always a challenge due to the exposure of multivariable resistance such as harsh locations, the number of skilled people required, the maintenance practices, equipment measurements, turbine types, and spares required. Inefficiency of operation readiness and maintenance planning will lead to a reduction of availability of offshore production, which directly impacting the production of oil and gas demand in operation performance. Hence this research is conducted to identify the current gap, identify the related contributing factors, suggest an improvement to the current maintenance workflow by identifying the gap from the available literature, analysing research data from the industry professionals and suggesting an improved operation readiness and maintenance planning framework. Based on the analysis, six main factors had been identified as contributing factors to the planning inefficiency. The current operation readiness and maintenance workflow is focusing on standard manufacturer recommended maintenance tasks, generally separating the offshore facility operation planning from the maintenance strategy, affecting the operation performance. Therefore, there is a need to improve the operation readiness and maintenance planning process by integrating all identified contributing factors and applying them in a structured operation management process rather than looking only at maintenance technicality.

Keywords:
Gas Turbine, Maintenance, Operation Management.

T041

Title:

Evolving with The Times: Physical Libraries in the Digital Era

Authors:
Nora Lina Mohd Hussain, Norhaida Hanim Ahmad Tajudin, Nur Irdina Mohd Lotfi, Hasni Meon and Muhammad Faiz Mokhtar

Abstract:
The advent of digital technology has transformed information access, leading to a perceived decline in the relevance of physical libraries. In Klang Valley, there is a growing concern about how physical libraries can remain significant in an era increasingly dominated by digital resources. This study aims to investigate user perceptions of physical libraries in the context of digital advancements, assess the relationship between user perspectives towards physical and digital libraries, and explore user preferences for resources. A quantitative approach was employed, collecting data from 147 respondents through a structured survey distributed via Google Forms. The survey included demographic information, users' perceptions of physical libraries, and preferences for digital technology. Statistical analysis was performed using chi-square, Pearson correlation, and mean score interpretation through the Statistical Package for the Social Sciences (SPSS) and Microsoft Excel. Findings reveal that while digital resource usage is on the rise, physical libraries continue to play a crucial role in community engagement and education. Users value the unique offerings of physical libraries, including their role as community centers and access to physical materials, underscoring the importance of evolving library services to enhance user experience. The study emphasizes that physical libraries must innovate and integrate digital technologies to remain relevant. By understanding user needs and perceptions, libraries can enhance their services, ensuring they continue to serve as essential community resources in the digital age.

Keywords:
Physical Libraries, Digital Age, Technology.

T001

Title:

Design and Modelling of Pneumatic Trimming System for Industrial Paper Production

Authors:
Hui Seng Low, Hashimah Ismail and Nazlin Hanie Abdullah

Abstract:
The lack of a total, systematic, and scientific way of studying pneumatic paper trimming handling systems, especially for advanced, sophisticated and high-speed industrial paper machines has resulted in many production issues, such as serious machine downtime, product quality as well as safety concerns, and therefore in a search for the optimum ways to meet this calling. However, research on the factors and parameters behind these trimming handling systems and their optimum modeling remains very lacking and limited. In this study, the main objective was to explore and identify the key parameters in the Pneumatic Paper Trimming Handling System—the most important designed parameters of airflow picking-up and conveying speeds for industrial paper trims had been investigated and studied by establishing mathematical modelling of quadratic polynomial equations for the systems concerned via the data collections at the sites as well as in-depth analysis for data collected and theoretical examinations. The optimum airflow patterns and modelling for the Pneumatic Trimming Handling Systems to be operated without blockages of the ducting systems can definitely be obtainable and achievable by the proper and correct designs of the pneumatic parameters. It has been found that the optimum speeds of airflow for picking up and conveying the industrial paper trims are 1,677 m/min and 2,230 m/min, respectively.

Keywords:
Pneumatic Paper Trimming, System Modelling, Paper Industry, High-Speed Conveyor, Picking-Up and Conveying Speeds.

T037

Title:

The Collaborative Nature of Fashion Photography: Exploring the Synergy Between Photographers and Their Subjects with New Digital Technology

Authors:
Afendi Md Shas Md Khaled and Nadzri Mohd Sharif

Abstract:
The dynamic realm of fashion photography has seen a growing partnership between photographers and their subjects, mostly attributable to the advent of new digital tools. Collaboration in fashion photography is essential, enabling the business to go beyond its commercial function and act as a catalyst for social and cultural expression. The efficacy of fashion photography often hinges on the photographer's capacity to cultivate robust connections with their subjects and collaborators, owing to the multifaceted and interrelated essence of culture and fashion. The triadic framework in fashion design underscores the need of harmonising "meaning," "trend," and "emotion" within the creative process. The impact of digital technology on fashion design is apparent, augmenting efficiency and creativity, as the revolution instigated by digital technology infiltrates every facet of the fashion industry. Contemporary fashion photographers amalgamate traditional techniques with modern technologies, producing a distinctive fusion of analogue and digital processes that propel the fashion industry ahead. Digital technology in fashion photography expedites the design process, enabling designers to swiftly iterate and alter designs without the delays and expenses linked to physical examples. The digital realm provides a platform for experimentation, enabling designers and photographers to investigate novel concepts and methodologies for communicating fashion trends, styles, and values to a broader audience. Examining the collaborative nature of this visual medium uncovers significant insights into the complex interactions among the fashion industry, cultural trends, and overarching social changes that shape our perceptions of beauty, identity, self-expression, and the evolving digital technology landscape in contemporary society.

Keywords:
Fashion Photography, Tripartite Paradigm, Emotional Impact, Collaborative Technology, Digital Visual Medium.

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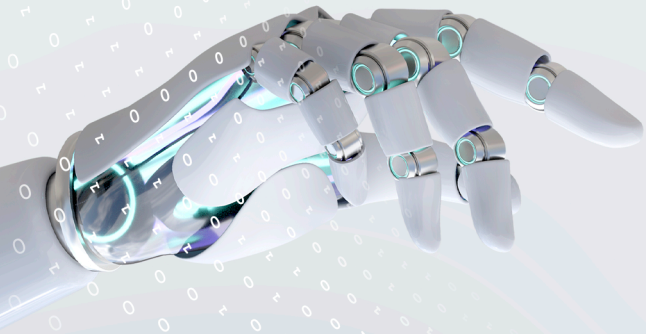

Designed by Rosliza Ahmad, FCVAC, UNISEL