

PROGRAMME & ABSTRACT BOOK

**KNOWLEDGE MANAGEMENT INTERNATIONAL CONFERENCE 2021
(KMICe2021)**

**“Bridging Knowledge and Technology towards Humanization and
Management of Pandemic Issues”**

1st February 2021

Virtual Conference

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MESSAGE FROM THE DEPUTY VICE-CHANCELLOR (RESEARCH & INNOVATION)



YBrs. PROF. DR. HAIM HILMAN ABDULLAH
Deputy Vice-Chancellor (Research & Innovation)
Universiti Utara Malaysia

Bismillahirrahmanirrahim

Assalamualaikum warahmatullahi wabarakatuh and Greetings

It gives me great pleasure to welcome you to the virtual 10th Knowledge Management International Conference (KMICe2021). This year's conference, with its theme, "**Bridging Knowledge and Technology towards Humanization and Management of Pandemic Issues**", continues its tradition of being the premier forum for the presentation of research and experience reports on the leading issues, applications, and theories pertaining to Knowledge Management.

KMICe2021 is jointly organised by the School of Computing and the School of Multimedia Technology and Communication, both of which are under the wing of the College of Arts and Sciences (CAS). Organising an international conference such as KMICe2021 must have certainly require a high degree of dedication and cooperation among the members of the organising committee. I thank them all for their dedication and diligence in ensuring that the various aspects of the conference put together as a harmonious whole.

I would also like to thank the keynote speakers, and the forum panelists, paper presenters, and participants for their enthusiasm in joining us virtually from all parts of the world to share their invaluable insights and knowledge in the field and thereby ensure the success of this conference. Last but not least, I would like to thank the KMICe2021 partners whose support has helped us greatly in bringing us together. On behalf of Universiti Utara Malaysia (UUM), I would like to thank you all, once again, for your continuous support and participation in this conference.

Lastly, I hope that you find this conference enlightening and fulfilling in terms of the expectations you have of it.

Thank you.

MESSAGE FROM THE UUM CAS ASSISTANT VICE-CHANCELLOR



YBrs. PROF. DR. HUDA HJ. IBRAHIM
Assistant Vice-Chancellor
UUM College of Arts & Sciences
Universiti Utara Malaysia

Bismillahirrahmanirrahim
Assalamualaikum warahmatullahi wabarakatuh

It is an honour for me to virtually welcome you to the 10th Knowledge Management International Conference (KMICe2021). KMICe2021 is organized by the School of Computing (SOC) and School of Multimedia Technology and Communication (SMMTC), UUM College of Arts and Sciences, Universiti Utara Malaysia. This conference provides a platform for local and international students, researchers, academia and industry players to share and promote research works that are related to the conference theme **“Bridging Knowledge and Technology towards Humanization and Management of Pandemic Issues”**.

KMICe2021 is one of the initiatives that brings together the researchers and academician from all the participating countries to further widen and strengthen the research in the field of Arts and Sciences. It is also a platform for researchers to share their findings in their field of expert.

I would like to take this opportunity to thank the members of organizing committee who are from the School of Computing (SOC) and School of Multimedia Technology and Communication (SMMTC), the keynotes speakers, forum panelists, authors and all participants for their continuous support to KMICe since it was first held in 2001. A special thank to the Universiti Utara Malaysia, and the supporting partner, Gurteen Knowledge Café for being supportive to KMICe.

I hope that this conference will be able to provide valuable knowledge as well as unforgettable experience to all of you. I wish everyone to enjoy all the sessions and I look forward to seeing you in the future. Do keep KMICe and UUM in your radar shall you look for events to share your knowledge and experiences, particularly in the area of knowledge management.

Thank you.

MESSAGE FROM KMICe2021 CONFERENCE CHAIR



ASSOC. PROF. DR. YUHANIS YUSOF
KMICe2021 Conference Chair
School of Computing
UUM College of Arts & Sciences
Universiti Utara Malaysia

Assalamualaikum wbt.

Alhamdulillah. Our Praise to Allah S.W.T

Allow me, in my capacity as KMICe2021 Conference Chair, to extend my warm welcome to all participants. I would like to express my utmost appreciation and sincere thanks for your support. Without the tremendous and continuous support, this 10th time special event, which is in our 20 years of organizing, would not have been materialized. This year, KMICe takes place across the backdrop of an unprecedented change due to Covid-19 and the significant impact the pandemic has had on various aspects of our economy, well-being and lives.

The main aim of organizing this event is to offer a platform for researchers, academics and students to present, share and promote their research and development strengths, particularly current issues in the Knowledge Management field. Although for years we have discussed the importance of knowledge management and how it could improve business operations and human well being, valuable experience of this Covid-19 pandemic, if managed and turned into explicit knowledge, will provide valuable reserves for the world and many information systems, and health care system, in particular. If the explicit knowledge is ignored, then it will lead to the loss of this enormous capital. With the theme of "**Bridging Knowledge and Technology towards Humanization and Management of Pandemic Issues**", KMICe2021 has received a total of 65 submissions and they are from various parts of the world – Nigeria, Iraq, UAE, Sri Lanka and Palestine, and of various types of organizations – public and private higher learning institutions as well as from the industries. However, due to a rigorous peer-reviewing process, not all submitted articles are accepted for publication and oral presentations.

This conference brings together emerging content in this significant field – which is not just an enabler for our global economy and education but will also demonstrate its true worth in post-pandemic. KMICe2021, a one-day knowledge sharing session will take place on-line, using Webex as the communication platform. My gratitude and credit are directed to all members of the organizing committee for their full commitment and hard work throughout the year. KMICe2021 would not have been possible without the help of these individuals. We are also grateful to the authors and the research community who continue to submit their excellent work to this event, and to the reviewers who continued to work during difficult times to provide detailed and rigorous reviews on time.

We hope you enjoy this event and continue to extend this important and exciting research area.

Thank you.

BIODATA OF SPEAKERS

KEYNOTE I



Keynote Speaker II
Dr. Jay Liebowitz
Visiting Professor
Stillman School of Business
Seton Hall University

Dr. Jay Liebowitz is one of the distinguished Knowledge Management (KM) researchers/practitioners in the world where he was ranked as one of the top 10 out of 11,000 KM researchers/practitioners and #2 in KM Strategy worldwide (January 2010 Journal of Knowledge Management). He is the Founding Editor-in-Chief of Expert Systems With Applications: An International Journal (published by Elsevier), Editor-in-Chief of Procedia-CS (Elsevier) and the Series Book Editor of the new Data Analytics Applications book series (Taylor & Francis). Dr. Liebowitz has published over 45 books and a myriad of journal articles on knowledge management, analytics, financial literacy, intelligent systems, and IT management. He is currently a visiting Professor in the Stillman School of Business at Seton Hall University which in prior he has lectured and consulted all around the globe including NASA Goddard Space Flight Center, Harrisburg University of Science and Technology, University of Maryland University College (UMUC), Johns Hopkins University, University of Maryland-Baltimore County, George Washington University, U.S. Army War College, Queen's University and Dalarna University in Sweden.

KEYNOTE II



Keynote Speaker II

Assoc. Prof. Dr. Bahtiar Mohamad

Resident Faculty

**Othman Yeop Abdullah Graduate School of Business (OYAGSB), UUM
Kuala Lumpur**

Dr. Bahtiar Mohamad is an Associate Professor of Corporate Communication and Strategy and Resident Faculty at Othman Yeop Abdullah Graduate School of Business (OYAGSB), UUM Kuala Lumpur. With a degree from National University of Malaysia; a Master of Science from Universiti Putra Malaysia, and a PhD from Brunel University London, United Kingdom, Bahtiar has been serving Universiti Utara Malaysia for approximately 18 years. Formerly, he served as a Head of Communication Department, Faculty of Communication and Modern Languages, UUM for three years from 2005 - 2008. From 2014 to 2016, he was Practicum Coordinator in the College of Arts and Sciences. Between 2017 and 2018, he was a Postgraduate Coordinator at School of Multimedia Technology and Communication. In January-December 2019 he was appointed as Dean for Student Development and Alumni for the College of Arts and Sciences, UUM. He currently serves as Director of MBA Programme, OYAGSB UUM Kuala Lumpur. He teaches Public Relations, Corporate Communication, Communication for Managers and Organizational Image Management, which all combine to support his hybrid profession linking communication with the management. He is carrying out research and publication in the area of corporate identity, corporate image, crisis communication and corporate branding from the point of view of public relations and corporate communication. Bahtiar has published over 100 research papers in reputed journals and conferences and has authored, co-authored, and edited 8 text-books. He is Member of Institute of Public Relations Malaysia (MIPR), European Communication Research and Education Association (ECREA), World Communication Association (WCA) and Pacific & Asia Communication Association (PACA). He was appointed as a Visiting Scholar at Faculty of Business, Curtin University, Adjunct Lecturer at Faculty of Social Sciences and Liberal Arts, UCSI University, Visiting Professor at Universitas Pendidikan Indonesia (UPI) and Asian Institute of Cambodia (AIC). He also the Academic Advisor for Universiti Sultan Zainal Abidin, Multimedia University, SEGi University, Kolej Universiti Poly-Tech MARA and Kolej Universiti Islam Melaka.

PANELISTS



Panelist I

Prof. Dr. Arminda V. Santiago
Dean of College of Mass Communication
University of the Philippines Diliman
Philippines

Professor Dr. Arminda V. Santiago is a tenured faculty member at the College of Mass Communication University of the Philippines in Diliman, where she is the current Dean. She is also an affiliate faculty member with the Faculty of Information and Communication Studies serving in the Doctor of Communication Program of the University of the Philippines Open University. She is also the Head of Production of TVUP, the Internet Television Station of the University of the Philippines System. She has a Ph.D. Communication degree from the University of the Philippines in 2006; Master of Arts in Radio, Television and Film from the University of North Texas (Denton, Texas, USA) in 1993 under a Fulbright-Hayes Scholarship Grant; a Master of Arts in Communication Research from the University of the Philippines in 1991; and a Bachelor of Arts in Broadcast Communication degree from the University of the Philippines in 1982. Prof. Santiago was a Visiting Associate Professor at the School of MultiMedia Technology and Communication at the Universiti Utara Malaysia under the Bachelor in Creative Industry Management (Film). She handled courses in Creative and Critical Thinking, Film History and Theory, Directing, Screenwriting and was the production thesis adviser for the first batch of BCIM Film graduates. Her dissertation entitled “Imaging The Filipino Woman: A Critical Discourse Analysis of Melodramatic Films Made by Filipino Mainstream Women Directors From 1990 to 2000” received the Award of Distinction from the 4th Lourdes Lontok-Cruz Award for Best Thesis in Women’s and Gender Studies for 2010 (Ph.D. Dissertation Category) in April 30, 2010.



Panelist II
Prof. Dr. Rasheed Gbenga JIMOH
University of Ilorin
Nigeria

Rasheed Gbenga JIMOH, a Professor in the Department of Computer Science, Faculty of Communication and Information Sciences, University of Ilorin is a Fellow Institute for Classical Entrepreneurship, a Registered Professional Information Technology Practitioner with Computer Professionals Registration Council of Nigeria (CPN) and a member of the Nigeria Computer Society (NCS). Professor Jimoh received his B.Sc. Degree in Computer Science from University of Ilorin with Second Class (Upper Division) in 2002. He had his M.Sc. Degree in Computer Science from the Premier University of Ibadan in 2006 and finally his Ph.D. in Information Technology from Universiti Utara Malaysia in 2010. He became a Professor in the Department of Computer Science, University of Ilorin in 2018 as the first Professor of Computer Science ever produced by the institution, eight years after he bagged his Ph.D. Degree. He was once a Deputy Director, Ilorin Business School, Head of Department of Computer Science and now Dean of the faculty. Professor Jimoh has served in various capacities both within and outside the University. He is currently a member of the governing council, Computer Professionals Registration Council of Nigeria and a National Executive member of the Nigeria Computer Society. Professor Jimoh has successfully trained 13 Ph.D. and 30 M.Sc. candidates in Computer Science respectively. A widely travelled Professor has several theses to his credits, as well as over 90 published articles in journals and referred conference proceedings. He is married to Dr. Mrs. Taibat Bolanle Jimoh, a union blessed with four children.



Panelist III
Dr. Ayad Hameed Mousa
University of Karbala
Iraq

Ayad Hameed Mousa was born in Basrah, Iraq. He received his PhD in Computer Science in 2017. He is a university lecturer since 2005, and was appointed as an Assistant Professor at the College of Science, University of Kerbala in the Department of Computer Science. Currently, he is the Director of Ibn Sina e-learning Center at University of Kerbala since 2020. His research is in the field of Technology and Innovation, with a special focus on Software engineering, business intelligence modeling, data mining, data warehouse, and e-learning modeling. He is actively engaged in several scientific projects (bilateral cooperation, national projects). He is the author or co-author of more than 27 papers in international journals and international conference contributions.

KEYNOTE SESSION

KEYNOTE I

The Next Generation of Knowledge Management: Perspectives from the Pandemic

Dr. Jay Liebowitz

Visiting Professor

Stillman School of Business

Seton Hall University

Jay.liebowitz@shu.edu

Brief Summary

Today's COVID-19 pandemic has created severe challenges for organizations, individuals, families, and society in general. Knowledge management can be used to improve collaboration and communication, increase innovation to allow organizations to be more adaptive and agile, and capture and share lessons learned to address COVID-19 and future pandemics.

The talk, based partly on Dr. Liebowitz's new book ([The Business of Pandemics: The COVID-19 Story](#) by Taylor & Francis), will first focus on the state-of-the-art of knowledge management worldwide. After setting this stage, various ideas on how knowledge management can address the COVID-19 pandemic, as well as ways to advance knowledge management in the near future, will be discussed. Finally, the top 10 "rules of the road" for knowledge management success, along with key knowledge sharing tenets, will be explained.

KEYNOTE II

Developing Internal Crisis Communication (ICC) Model: A Strategy to Improve Agility among Malaysian Employees during the COVID-19 Pandemic

Assoc. Prof. Dr. Bahtiar Mohamad

Resident Faculty, Othman Yeop Abdullah Graduate School of Business (OYAGSB)

Universiti Utara Malaysia

Kuala Lumpur Campus, MALAYSIA

Email: mbahtiar@uum.edu.my

Brief Summary

Through the lens of situational crisis communication theory and sensemaking theory, the purpose of this talk is to present the causal relationships among internal crisis communication (ICC), safety culture, supportive environment, perceived organizational support, and online communication satisfaction in the context of Malaysian employees during the Covid-19 pandemic.

The results suggest that safety culture and supportive environment increase ICC. Public organizations can conduct training programs to develop internal crisis communication skills in their managers to increase the support to employees; thereby its positive consequences will follow in increasing employees' organizational support, and online communication satisfaction.

PROGRAMME OVERVIEW

TIME	MONDAY, 1 ST FEBRUARY 2021				
8.15 – 08.30	Registration				
08:30 – 09.00	<p>Welcoming speech: Assoc. Prof. Dr. Yuhanis Yusof, KMICe2021 Chair</p> <p>Opening Remarks: YBrS. Prof. Dr. Haim Hilman Abdullah, Deputy Vice Chancellor (Research & Innovation), Universiti Utara Malaysia</p>				
09:00 – 10:00	<p>Keynote Speaker I: Dr. Jay Liebowitz The Business of Pandemics: The COVID-19 Story</p>				
10:00 – 11.00	<p>Keynote Speaker II: Assoc. Prof. Dr. Bahtiar Bin Mohamad Developing Internal Crisis Communication (ICC) Model: A Strategy to Improve Agility among Malaysian Employees during the COVID 19 Pandemic</p>				
11:00 – 13.00	<p>Forum: Responding to COVID-19 challenges with Innovation via Digital Surge: New Ways of Work and Life</p> <p>Moderator: YBrS. Prof. Dr. Norshuhada Shiratuddin</p> <p>Panelists: Prof. Dr. Arminda V. Santiago, University of the Philippines Diliman, Philippines Prof. Dr. Rasheed Gbenga Jimoh, University of Ilorin, Nigeria Dr. Ayad Hameed Mousa, University of Karbala, Iraq</p>				
13.00 – 14.00	Lunch Break				
14.00 – 15.30	PARALLEL SESSION A				
	Session A1	Session A2	Session A3	Session A4	Session A5
	PID178	PID128	PID131	PID154	PID146
	PID133	PID152	PID145	PID168	PID135
	PID136	PID163	PID147	PID173	PID180
	PID137	PID169	PID188	PID179	PID181
PID208		PID206	PID158	PID209	
15.30 – 17.00	PARALLEL SESSION B				
	Session B1	Session B2	Session B3	Session B4	Session B5
	PID149	PID174	PID151	PID184	PID185
	PID157	PID182	PID165	PID186	PID192
	PID197	PID183	PID191	PID187	PID175
	PID121	PID189	PID190	PID198	PID203
PID205	PID200	PID202	PID201	PID162	
17:00 – 17.20	<p>Announcement & Video Presentation of Best Paper Awards</p> <p>Closing remarks: YBrS. Prof. Dr. Huda Ibrahim, Dean of SOC & UUM CAS Assistant Vice Chancellor, Universiti Utara Malaysia</p>				

PARALLEL SESSION

Parallel Sessions A [14.00 – 15.30]

Session A1 [Knowledge Management, Theory, and Practices] Chair: Assoc. Prof. Dr. Mazni Omar		
Time	PID	Title & Authors
14.00	PID178	"Do you trust me?" - The Outlook of Belief, Desire and Intention in the Fourth Industrial Revolution <i>Shahrinaz Ismail, Nordiana Jamaludin, and Salama A Mostafa</i>
14.15	PID133	Knowledge Creation in Malaysia: a SWOT analysis <i>Tung Soon Seng and Magiswary Dorasamy</i>
14.30	PID136	Updated DeLone and MacLean IS Success Model and Commercial Open Source Software (COSS) Company Success <i>Shimels Diriba, Rathimala Kannan, and Ian Chai</i>
14.45	PID137	Trust, Commitment, Motivation and Knowledge Sharing Behaviour Among Business Service Professionals <i>Mohd Misron Omar, Romiza Md Akhir, Noor Raihan Ab Hamid, Yasmin Mohd Misron and Kamilia Mohd Misron</i>
15.00	PID208	Automated Garment Measurement Prototype: A Contactless Means <i>Nor Iadah Yusop and Shubashini A/P Thinakaran</i>

Session A2 [Knowledge Management in Healthcare and Pandemic] Chair: Dr. Syahida Hassan		
Time	PID	Title & Authors
14.00	PID128	Knowledge Map for kXpert: Humanising the Quest of Finding Experts <i>Shahrinaz Ismail, and Afifah Aliah Ahmad Suhaimi</i>
14.15	PID152	Challenges in Implementing Online Language Assessment-A Critical Reflection of Issues faced amidst Covid 19 Pandemic <i>Norkhairi Ahmad, Ina Suryani Ab Rahim and Salawati Ahmad</i>
14.30	PID163	Predictive Analytics on University Student Dropouts from Online Learning Due To MCO <i>Md Erfan Sultan, Mohd Norshahriel Abd Rani, Nabilah Filzah Mohd Radzuan and Lim Huay Yen</i>
14.45	PID169	Analysis of Space Management Following the Successful Transformation of the Malaysia Agriculture Expo Park Serdang (MAEPS) Into a Low Risk COVID-19 Quarantine and Treatment Centre <i>Siti Aisyah Muhammad, Tengku Fauzan Tengku Anuar, Nur Athmar Hashim, and Hequan Zhang</i>

Session A3 [Knowledge Management in Education] Chair: Dr. Alawiyah Abd. Wahab		
Time	PID	Title & Authors
14.00	PID131	Personalized Microlearning Resources Generation and Delivery: A Framework Design <i>Shin-Yan Chong, Fang-Fang Chua And Tek-Yong Lim</i>
14.15	PID145	Students' Acceptance of Automated Essay Scorer-Reflection on an Initiative to Mitigate Disruption to Writing Lessons during Pandemic <i>Mohammad Radzi Manap, Norkhairi Ahmad, and Zulkarnin Zakaria</i>
14.30	PID147	Monopoly-based Game with Augmented Reality Intervention in Higher Education <i>Noradila Nordin, Nur Rasyidah Mohd. Nordin, and Wafa Omar</i>
14.45	PID188	Strengthening Curriculum Structure of Software Engineering Programme <i>Yanti Rosmunie Bujan, Wang Hui Hui, Nurfaeza Jali, Tan Ping Ping, Edwin Mit, Azman Bujang Masli, Cheah Wai Shiang, Abdul Rahman Mat, , Norazian binti Mohamad Hamdan, Mohamad Johan bin Ahmad Khiri, Wee Bui Lin, Eaqerzilla Phan and Mohamad Asyraf bin Khairuddin</i>
15.00	PID206	Automated Feedback Generation for Automatic Programming Assessment: Its Conceptual and Initial Analysis of Mapping Studies <i>Ahmed Abdulsalam Abdulmajeed Al-Athwari, Rohaida Romli</i>

Session A4 [Knowledge Management Application] Chair: Assoc. Prof. Dr. Mazida Ahmad		
Time	PID	Title & Authors
14.00	PID154	Test Case Quality: Issues and Limitations in Agile Software Development <i>Samera Obaid Barraood, Haslina Mohd, and Fauziah Baharom</i>
14.15	PID168	A Comparison Study of Software Testing in Agile Methods <i>Samera Obaid Barraood, Haslina Mohd, and Fauziah Baharom</i>
14.30	PID173	A Review on Usability Requirements of Visually Impaired Users for Accessible E-book Apps <i>Munya Saleh Saeed Ba Matraf, Nor Laily Hashim, and Azham Hussain</i>
14.45	PID179	Usability Evaluation Factors in Acquiring Knowledge through Mobile E-Book Applications by Visually Impaired Users <i>Nor Laily Hashim, Munya Saleh Saeed Ba Matra, Azham Hussain</i>
15.00	PID158	Strategies to Enhance Commercialisation Activity: Researcher Perspective <i>Nabilla Afzan Abdul Aziz, Nurshafiza Ismail, and Arif Hartono</i>
15.15	PID160	Insights of Research Commercialisation through University Technology Transfer Office <i>Nurshafiza Ismail, Nabilla Afzan Abdul Aziz, and Arif Hartono</i>

Session A5 [Knowledge Management in IR 4.0]		
Chair: Assoc. Prof. Ts. Dr. Mohd. Hasbullah bin Omar		
Time	PID	Title & Authors
14.00	PID146	An Image-based Fall Detection System using You Only Look Once (YOLO) Algorithm to Monitor Elders' Fall Events <i>Koh Zhen Long, Hazlina Haron, Maizura Ibrahim, and Zeti Darleena Eri</i>
14.15	PID135	Survey on vulnerability of 4G/LTE network security and improvements <i>Alyaa Ghanim and Zahraa Mazin Taha Alkattan</i>
14.30	PID180	Exploring the significance of IoT-Enabled Health Monitoring and Assistive Systems for Elderly NCD Patients in Malaysia <i>Shamima Raihan Manzoor, Chinnasamy Malarvizhi</i>
14.45	PID181	Towards Central Repository Design for Domain of Interlocking Institutional Worlds: Successful Collaboration Starts with a Sharing Platform <i>Mohd Ismawira Mohd Ismail, Mohammad Nazir Ahmad, Nor Hidayati Zakaria, and Kamarul Faizal Hashim</i>
15.00	PID209	The Design and User Acceptance of IoT-based Access and Entrance Control System Using Voice Recognition <i>Ling Zhong Li, Mohd Samsu Sajat, Yuhanis Yusof, Yousef Fazea and Harja Santana Purba</i>

Parallel Sessions B [15.30 – 17.00]

Session B1 [Knowledge Management, Theory, and Practices]		
Chair: Assoc. Prof. Ts. Dr. Azman Ta'a		
Time	PID	Title & Authors
15.30	PID149	The Influence of Crisis Response on Social Interaction and Public Resilience Based on Importance-Performance Map Analysis (IPMA) <i>Umar Ali Bukar, Marzanah A. Jabar, Fatimah Sidi, Rozi Nor Haizan Binti Nor, and Salfarina Abdullah</i>
15.45	PID157	Impact of knowledge management, financial resource, innovation, and foreign direct investment on entrepreneurship <i>Hui-Shan LEE, Shyue-Chuan CHONG, Bik-Kia SIA, Ying-Chyi CHOU, and Wen-Xiu LI</i>
16.00	PID197	Knowledge Sharing on the Acceptance of Smart Waste Management System: Moderating Effects of Local Cultures <i>Mohd Khairul Maswan Mohd Redzuan, Norshita Mat Nayan, Mohammad Nazir Ahmad, and Nor Hazila Mohd Zain</i>
16.15	PID121	Knowledge Work Productivity Measurement for Software Development Process in SMEs <i>Mohd Zairol Yusoff</i>
16.30	PID205	Fight Against Phishing Attacks Among Internet Banking User: A Knowledge Management Technique <i>Fadare Olusolade Aribake and Zahurin Mat Aji</i>

Session B2 [Knowledge Management in Healthcare and Pandemic]		
Chair: Dr. Hapini Bin Awang		
Time	PID	Title & Authors
15.30	PID174	Knowledge management in pandemics: Design and Implementation of Social Distancing Mobile Application <i>Rabi Mustapha, Muhammed Auwal Ahmed, and Muhammad Aminu Ahmad</i>
15.45	PID182	Verification of an Integrated Computational Model of Self-Efficacy, Motivation and Anxiety for a Human Mental State <i>Naseer Sanni Ajoge, Azizi Ab Aziz, and Shahrul Azmi Mohd Yusof</i>
16.00	PID183	Agile Approach and Adaptability into Complex Environment Management and Operation: A Case of Malaysia Battlement Against Covid-19 <i>Mohamad Firdaus Mat Saad and Aliza Abdul Latif</i>
16.15	PID189	Perception and Usage of Cloud Storage for E-learning in University of Samarra Staff during the period of Covid-19 pandemic: A Pilot Study <i>Omar Hamid Flayyih and Husam Abdulhameed Hussein</i>
16.30	PID200	Personal Knowledge Acquisition: Does Educator Acquire New Knowledge during the Movement Control Order? <i>Dewi-Izzwi, A. M., Kalsom Salleh, Jamaliah Said and Muhamad Nizam Jali</i>

Session B3 [Knowledge Management in Education]		
Chair: Assoc. Prof. Dr. Azizah Ahmad		
Time	PID	Title & Authors
15.30	PID151	The Design of Sci-oTSL: An Internet of Things Platform to Support Collaborative Learning for Science subject in Primary School <i>Logadarshinni Maratha, Khairul Shafee Kalid, and Wan Fatimah Wan Ahmad</i>
15.45	PID165	Assessing the Readiness of Higher Education Institution (HEI) in Malaysia to Accept Generation Alpha using Predictive Analytics <i>Tan Lik Wei, Mohd Norshahriel Abd Rani, and Nabilah Filzah Mohd Radzuan</i>
16.00	PID191	A systematic literature review: The conceptual of educational game design with augmented reality <i>Irma Shayana Samaden, Ibrahim Ahmad, Mohd Edzwan Zahri, Sazilah Salam and Ismahafezi Ismail</i>
16.15	PID190	Developing an Evaluation Methodology for Immersive Learning Experiences for Software Engineering Project Course <i>Nurfauza Jali, Norazian Mohamad Hamdan, Cheah Wai Shiang, and Suriati Khartini Jali</i>
16.30	PID202	Defining Core Knowledge Elements of Adaptive Augmented Reality (A2R) through Conceptual Model Analysis <i>Norshuhada Shiratuddin, Tenh Hock Kuan</i>

Session B4 [Knowledge Management Application] Chair: Assoc. Prof. Dr. Nur Haryani Zakaria		
Time	PID	Title & Authors
15.30	PID184	Design and Development of Quranic Parables Information System: A Web based System for Understanding Quran Verses <i>Shakir Zufayri Osman, Shafinah Farvin Packeer Mohamed and Syed Sultan Bee Packeer Mohamed</i>
15.45	PID186	System Dynamics Model For Financial Management Among University Students <i>Che Rohayu Darlynie Che Mohd Khalid, Hasimah Sapiri , Masnita Misiran and Zahayu Md Yusof</i>
16.00	PID187	The Development of an e-Driver: Creating Awareness of Ethics in Driving via Game-Based Learning <i>Muhammad Syafiq Saharudin, Ismassabah Ismail, Norzilah Musa, Zainab Othman, and Nurul Hidayah Mat Zain</i>
16.15	PID198	The Current Practices and Required Knowledge for Non-Functional Requirements Elicitation in Agile Context: A Pilot Study in Jordan <i>Mohammed Saleh, Fauziah Baharom, Shafinah Farvin Packeer Mohamed, and Aniza Mohamed Din</i>
16.30	PID201	Route Planning Mobile Application in Transportation Management <i>Ong Xun Sheng, Yuhani Yusof and Norliza Katuk</i>
16.45	PID162	Sentiment analysis of Arabic tweets on the Great March of Return using Machine Learning <i>Saad Tareq Daher, Ashraf Yunis Maghari, and Hussam Fares Abushawish</i>

Session B5 [Knowledge Management in IR 4.0] Chair: Assoc. Prof. Ts. Dr. Norliza Katuk		
Time	PID	Title & Authors
15.30	PID185	WasteBOT: Conceptual Design of Smart Bin and Web Service for IoT Waste Management System <i>Manmeet Mahinderjit Singh, Wong Khang Siang, Nor Saralya Azwa Kamaruddin, Muhammad Rafie Mohd Arshad, Mohd Halim Mohd Noor, Nur Intan Raihana Ruhaiyem</i>
15.45	PID192	Automated Fish Egg Counting System using Image Processing <i>Nor Hazlyna Harun, Nooraini Yusof, Mohamad Ghozali Hassan and Maizatul Fatihah Mohd Salleh</i>
16.00	PID175	Data Visualization for Multimedia Super Corridor Malaysia using Dot Distribution Maps <i>Mohd Suffian Sulaiman, Amira Yasmin Raimy, and Azri Azmi</i>
16.15	PID203	E-Waste Recycling Awareness in Young Adults in Malaysia: An Interactive Courseware <i>Musyrifah Mahmod, Lee Angie, Emy Ezura A Jalil and Nor Farzana Abd Ghani</i>

ABSTRACTS

PID121

KNOWLEDGE WORK PRODUCTIVITY MEASUREMENT FOR SOFTWARE DEVELOPMENT PROCESS IN SMES

Mohd Zairol Yusoff

SMK Dato' Syed Omar Alor Setar Kedah, MALAYSIA {zaruly@outlook.my}

Abstract

Small and medium-sized enterprises play an important role in the growth of the economy, but most enterprises have failed to develop knowledge work productivity (KWP). The purpose of this study is to discover and propose KWP measurement factors in software development process in small and medium-sized enterprises (SMEs). First, we are making theoretical and prior research progress before the key features of KW and KWP were defined. Secondly, the conceptual model, which explores the relationship between the KW and KWP dimensions, has been built. This research will use the data collected from 150 Malaysian SMEs. Structural equation modelling or SEM was used to validate the model. Based on the results, we propose KWP measurement factors that can help knowledge-based companies, such as SMEs, measure employee productivity.

Keywords: *Knowledge work, Knowledge Work Productivity, SMEs.*

KNOWLEDGE MAP FOR KXPert: HUMANISING THE QUEST OF FINDING EXPERTS

Shahrinaz Ismail¹ and Afifah Aliah Ahmad Suhaimi²

*¹Universiti Kuala Lumpur, Malaysian Institute of Information Technology, Malaysia
{shahrinaz@unikl.edu.my}*

*²Universiti Kuala Lumpur, Malaysian Institute of Information Technology, Malaysia
{leyasuhaimi@gmail.com}*

Abstract

The global pandemic of Covid-19 in 2020 has brought upon an impact to the economy, with high unemployment rate in all countries including Malaysia. Organisations experienced high employee turnover and knowledge loss along with the employees who left them. This impact has beckoned the ever needed quest of finding experts, with expertise verified from reliable knowledge sources. This paper looks into the design of knowledge map for kXpert framework that humanises the online search for experts, based on the common practice in a knowledge-intensive organisation. The knowledge map is expected to reduce the time and effort of engaging in conversation to get to know a person to verify whether he or she is the right expert in demand. Nevertheless, this knowledge map is only part of the overall framework of knowledge-based information retrieval for expert profiling (kXpert), which provides the guide for the system development at later stage.

Keywords: knowledgebase, information retrieval, expert profiling, knowledge expertise mapping

**PERSONALIZED MICROLEARNING RESOURCES GENERATION AND DELIVERY: A
FRAMEWORK DESIGN**

Shin-Yan Chong¹, Fang-Fang Chua¹ and Tek-Yong Lim¹

*¹Multimedia University, Malaysia {1151103178@student.mmu.edu.my,
ffchua@mmu.edu.my, tylim@mmu.edu.my}*

Abstract

The evolution of digital technologies is leading the world towards the direction of the information explosion. It gradually increases the difficulty for the people to find appropriate content to learn. It has becoming a norm whereby people often use their fragmented spare time for learning. It leads to the motivation to look for a solution to boost up the learning effectiveness. Microlearning serves as a service to generate and deliver microlearning resources to the learners. However, it is also challenging to convey the microlearning resources to each learner based on different learning needs. In this paper, a personalized microlearning framework named “Unique-Learn” is proposed. It possesses the intelligence to identify the real learning needs of a learner based on the contextual information, then conveys the appropriate microlearning videos to the learner from time to time. The proposed implementation plan details how the “Unique-Learn” will be used in a workplace environment for the employee’s training and development purpose.

Keywords: *Personalization, Microlearning Resources, Adult’s Learning*

KNOWLEDGE CREATION IN MALAYSIA: A SWOT ANALYSIS

Tung Soon Seng¹ and Magiswary Dorasamy²

¹*Multimedia University, Malaysia, {1121200047@student.mmu.edu.my}*

²*Multimedia University, Malaysia, {magiswary.dorasamy@mmu.edu.my}*

Abstract

Malaysia aims to be a developed nation by 2025. In congruence with this, the National Industry 4.0 Strategy (NI4.0) was launched in 2018 to accelerate high-technology adoption, improve efficiency and competitiveness across industries. NI4.0 utilizes data across the dynamics enactment process to maximize businesses' intelligence capacity as a smart factory in the ASEAN region. The effect of high-technology adoption in NI4.0 is expected to accelerate knowledge creation (KC). However, research on this impact is still scant. As such, KC should be promptly analyzed as it has become a global source for competition- surpassing individuals, organizations, and nations. IT professionals are heavily reliant on the value of KC to sustain competitive advantage. Evidence shows that KC in Malaysia is growing at a slower rate. Therefore, this paper aims to provide a SWOT analysis of KC in Malaysia, discussion of the evidence and insights for a slower KC growth and discussion of the findings to accelerate KC in Malaysia.

Keywords: Knowledge Creation, National Industry 4.0, SWOT analysis

SURVEY ON VULNERABILITY OF 4G/LTE NETWORK SECURITY AND IMPROVEMENTS

Alyaa Ghanim and Zahraa Mazin Taha Alkattan

^{1,2}Software engineering Dept., Mosul University, Iraq

{¹alyaa.ghanim@uomosul.edu.iq,²zahraa.alkattan@uomosul.edu.iq}

Abstract

Network security is considered a significant issue in our daily life due to its entering into many people's activities such as social activity, marketing and business. However, the need for a secure and powerful network has increased. The needs for a secure network have increased due to the increasing threats and hackers in our daily life. In fact, based on the current statistics, each second the number of subscribers are increasing by 10 times worldwide which refers to the fast growth of 4G /LTE networks. It is noticed that 80 per cent of people globally have owned 4G mobile phones and the number is increasing during the recent several years. Furthermore, 4G/LTE is the foundation of the 5G network, so advanced security is needed. From this point, this paper presents a survey of the improvements that have been done recently on 4G/LTE security and reveals the weaknesses that still exist and that will allow researchers to focus and work on these weaknesses. Keywords: Attacks, 4G/LTE, vulnerability, security.

Keywords: *Attacks, 4G/LTE, vulnerability, security*

UPDATED DELONE AND MACLEAN IS SUCCESS MODEL AND COMMERCIAL OPEN SOURCE SOFTWARE (COSS) COMPANY SUCCESS

Shimels Diriba Garomssa¹, Rathimala Kannan², and Ian Chai³

¹Multimedia University, Malaysia, {1181402786@student.mmu.edu.my}

²Multimedia University, Malaysia, {rathimala.kannan@mmu.edu.my}

³Multimedia University, Malaysia, {ianchai@mmu.edu.my}

Abstract

Commercial Open Source Software (COSS) is a promising business model as it represents the middle ground between expensive proprietary software and free software. The unique nature of COSS companies has captured researchers' attention; hence several studies have been conducted to assess the success of a few prominent COSS companies. However, comprehensive empirical study consisting of various COSS companies' of different size, type, and prominence is lacking. Hence, the aim of this study is to evaluate the success of diverse COSS companies by adapting the DeLone and McLean Updated Information Systems (IS) Success Model. The result indicates that COSS companies' success is significantly influenced by user satisfaction while the impact of software use on COSS company success is insignificant. Moreover, both software quality and product property positively impact user satisfaction as well as software use.

Keywords: *Commercial Open Source Software, company success, DeLone & McLean Model*

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**TRUST, COMMITMENT, MOTIVATION AND KNOWLEDGE SHARING BEHAVIOUR AMONG
BUSINESS SERVICE PROFESSIONALS**

***Mohd Misron Omar, Romiza Md Akhir, Noor Raihan Ab Hamid, Yasmin Mohd Misron and
Kamilia Mohd Misron***

*UNITAR International University, Malaysia, {mison.pt@unitar.my, romiza @unitar.my,
raihan@unitar.my}*

Abstract

Professional employees in the business service organizations are important resources when they share their knowledge. In the pursuit to leverage on employees' knowledge and in supporting knowledge sharing, business service organizations are using knowledge management system's platform. Although knowledge management systems are vital, the reality in the actual implementations have shown that technology could not be assured that knowledge would be shared. Professional employees have option in sharing their individual intelligent knowledge. There are many determinants of knowledge sharing behaviour. Thus, an objective of the study was to search for the determinants for knowledge sharing behaviour of professional employees in the business service organizations. The sampling unit of this research are professional employees working in business service sector within the context of Malaysia National Key Economic Area" (NKEA). The collection of the primary data was through the questionnaires that stratified chosen from the sampling. The survey findings are analysed using the SPSS and SMART PLS. Knowledge sharing behaviour was predicted by professional employees of the business service organizations' on the intention of their knowledge sharing. Thus, the intention was predicted by professional employees of the business service organizations perceived behavioural control, subjective norms and attitude. The professional employees of business service organizations perceptions of motivation and commitment were positively associated with favourable intention towards knowledge sharing. Alternately, different results indicated insignificant relationships.

Keywords: Knowledge sharing, trust, motivation, commitment, business service

STUDENTS' ACCEPTANCE OF AUTOMATED ESSAY SCORER-REFLECTION ON AN INITIATIVE TO MITIGATE DISRUPTION TO WRITING LESSONS DURING PANDEMIC

Mohammad Radzi Manap¹, Norkhairi Ahmad² and Zulkarnin Zakaria³

¹Universiti Teknologi MARA, Malaysia, {moham830@uitm.edu.my}

²Universiti Kuala Lumpur Malaysia France Institute, Malaysia, {norkhairi@unikl.edu.my}

³Kolej GENIUS Insan, Universiti Sains Islam Malaysia {zulkarnin@usim.edu.my}

Abstract

Automated Writing Evaluation (AWE) is an innovation in the field of language teaching and learning with features like portfolio and writing assistant resources has become a useful alternative to support language assessment processes during the pandemic. Like many artificial intelligence-based tools, there is always concern on scoring accuracy, reliability, and acceptance by users. This paper aims to explore language learners' experience in using an AWE called PaperRater (PR) available from the internet. Data was elicited via a questionnaire designed based on the Technology Acceptance Model (TAM) and it focuses on six variables of acceptance namely perceived usefulness, perceived ease of use, user satisfaction, usability, user behaviour and user profiles. Rasch model and descriptive statistical analysis were used in analysing responses from 62 undergraduates. The respondents are found to have a positive level of acceptance towards the use of AWE as depicted by the -1.21 to 2.07 Rasch logit unit. This tool is also perceived to be beneficial for formative learning purposes via students' self-assessment, in the absence of educators in physical classes and limited online access to educators during this pandemic.

Keywords: Automated Essay Scorer, L2 Writing, Mitigating disruption

**AN IMAGE-BASED FALL DETECTION SYSTEM USING YOU ONLY LOOK ONCE (YOLO)
ALGORITHM TO MONITOR ELDERS' FALL EVENTS**

Koh Zhen Long¹, Hazlina Haron¹, Maizura Ibrahim² and Zeti Darleena Eri³

¹SEGI College Subang Jaya, Selangor, Malaysia, {KohZhenLong@segi.edu.my,
hazlinaharon@segi.edu.my)

²Malaysian Nuclear Agency, Kajang, Selangor, Malaysia {maizura@nuclearmalaysia.gov.my)

³Universiti Teknologi MARA Cawangan Terengganu, Kampus Kuala Terengganu, Malaysia,
{zetid415@uitm.edu.my)

Abstract

Fall is one of the primary causes of fatal as well as non-fatal injuries in the elderly community. The falls in the elderly may cause different consequences and in serious cases, it may cause death. Timely treatment is critical where immediate treatment may reduce the risk of serious injuries. The detection should be taken out in an automated way and detect fall events accurately. This paper presented the image-based fall detection system which integrated the YOLO object detection algorithm with the Image-based Fall Detection system algorithm in detecting fall events. The system will first get track of the person in the video frame with the object detection algorithm and the fall detection algorithm will be used to get track of the person's height and to detect fall events immediately and accurately to notify the caregivers. The system was evaluated with different use cases and conditions. The result shows the system can detect fall events with the accuracy of 92% under the daylight condition and 60% under the low light condition. An email notification will be sent as an alarm to notify the caregivers when any fall events were detected by the system. The quick fall detection and notification of system able to ensure the safety of the elderly were well monitored and timely treatment can take place when fall events were detected by the system.

Keywords: *Fall Detection, You Only Look Once, Image-based fall detection, Object-based detection*

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MONOPOLY-BASED GAME WITH AUGMENTED REALITY INTERVENTION IN HIGHER EDUCATION

Noradila Nordin, Nur Rasyidah Mohd. Nordin and Wafa Omar

Universiti Utara Malaysia, Malaysia, (nnoradila@uum.edu.my, nurrasyidah@uum.edu.my, wafa@uum.edu.my)

Abstract

The gamification intervention is a pedagogical approach of learning activities that introduces game mechanics in a non-game context to drive the learning outcomes. In the era of technology and recent advances, the education system has evolved significantly, by adopting many software, tools, and gamification elements to learning. This concept paper will discuss how board games could be developed based on the typical gamification mechanics, specifically adopting the concepts of Monopoly. The application of board games with Augmented Reality (AR) elements in learning among undergraduate students is a new approach that can be taken in the classroom. By implementing AR into any gamification-based intervention, it gives the player better immersion and a different experience than they are used to. This study proposed that any subject in Higher Education will be better understood through the elements of gamification using board games. Additionally, the utilization of gamification in the education context exerts the element of fun in learning, through motivation and enthusiasm.

Keywords: *Gamification, Augmented Reality, Student-based Learning*

**THE INFLUENCE OF CRISIS RESPONSE ON SOCIAL INTERACTION AND PUBLIC RESILIENCE
BASED ON IMPORTANCE-PERFORMANCE MAP ANALYSIS (IPMA)**

*Umar Ali Bukar¹, Marzanah A. Jabar², Fatimah Sidi³, Rozi Nor Haizan binti Nor⁴, and Salfarina
Abdullah⁵*

*^{1,2,4,5}Department of Software Engineering and Information System, Faculty of Computer
Science and Information Technology, Universiti Putra Malaysia (UPM), Serdang 43400, 9,
Malaysia, {umarfalmata@gmail.com, marzanah@upm.edu.my, rozinor@upm.edu.my,
salfarina@upm.edu.my }*

*³Department of Computer Science, Faculty of Computer Science and Information Technology,
Universiti Putra Malaysia (UPM), Serdang 43400, Malaysia, {fatimah@upm.edu.my}*

Abstract

This study aimed to investigate the influence of crisis, crisis response, and social media interaction on public resilience by using the importance-performance map analysis (IPMA) method. Data collected through empirical study consists of 167 observations; comprising Malaysians that have experienced Covid-19 lockdown. The reliability and validity of the measurement models were assessed by Cronbach's alpha, coefficients rho A, composite reliability, and discriminant validity values. The IPMA compares the constructs and indicators level from the performance scale mean value against the importance. The result shows that all the constructs and most of the indicators are important and reveal good performance. Thus, future research activity should be focusing on maintaining the constructs and indicators' at the performance level. Therefore, our findings revealed that the overall constructs and indicators' should be having high priority by crisis management and communication authorities and researchers.

Keywords: *crisis communication, crisis response, social media, social interaction, resilience, and IPMA*

THE DESIGN OF SCI-OTLS: AN INTERNET OF THINGS PLATFORM TO SUPPORT COLLABORATIVE LEARNING FOR SCIENCE SUBJECT IN PRIMARY SCHOOL

Logadarshini Maratha¹, Khairul Shafee Kalid¹ and Wan Fatimah Wan Ahmad¹

¹Universiti Teknologi PETRONAS, Malaysia, {logadarshinni_24592@utp.edu.my, khairulshafee_kalid@utp.edu.my, fatimhd@utp.edu.my}

Abstract

The Science, Technology, Engineering and Mathematics (STEM) initiative in Malaysian Education Blueprint 2013-2025 aims to develop students with necessary skills which could face the challenges of science as well as technology and to ensure Malaysia produces enough qualified graduates in STEM. Nonetheless, the number of students taking STEM subject is declining over the years. Factors that lead to the decline have been investigated by many studies. One of the factors is attributed to student's experience in class which the students perceived that STEM subjects are boring and dull. This study attempts to propose the use of Internet of Things (IoT) platform as a teaching tool for STEM subjects to make the learning of the subjects more interesting. This paper presents the design of Sci-oTLS, an IoT platform that supports collaborative learning of Science subject in primary school. The objective of this study is to propose the design of an IoT platform that supports collaborative learning in Science subject. The method of this study consists two phases. The first phase concerns with the distribution of a small survey to teachers to get their preliminary feedback on the use of IoT in teaching and learning of STEM. The second phase concerns with the design of the Sci-oTLS platform. The results indicate that teachers are open to idea of using IoT platform such as Sci-oTLS as a teaching tool because they feel that it will enhance student's interest in learning Science. The requirements and system architecture of Sci-oTLS are also presented in this paper.

Keywords: Internet of Things, IoT, Teaching and Learning, Education

**CHALLENGES IN IMPLEMENTING ONLINE LANGUAGE ASSESSMENT-A CRITICAL REFLECTION
OF ISSUES FACED AMIDST COVID 19 PANDEMIC**

Norkhairi Ahmad¹, Ina Suryani Ab Rahim² and Salawati Ahmad³

¹Universiti Kuala Lumpur Malaysia France Institute, {norkhairi@unikledu.my}

²Universiti Malaysia Perlis, {inasuryani@unimap.edu.my}

³Universiti Tun Hussein Onn Malaysia, {salawati@uthm.edu.my}

Abstract

Over the years many literature on language assessment continue to highlight a myriad of issues and challenges. The delivery of tertiary language courses including their assessments components were put to the test during the recent outbreak of Covid-19 pandemic that necessitates total shift to online mode from the previously conventional or partially online. Due to this circumstance, this paper aims to identify the challenges faced by language lecturers in administering assessment in the online mode and the need to plan good mitigation strategies. Qualitative data was elicited from twenty one key language lecturers as purposive samplings from eleven public universities. Based on basic Delphi approach, they were grouped according to three expertise domains namely online language learning, language curriculum and pedagogy. The expert respondents gave inputs and views to questions via structured written interviews as well as follow-up oral interviews. Emerging themes from the qualitative responses point towards ten challenges representing four categories of issues namely infrastructure, lecturers' online assessment literacy, language learners' commitment and integrity and absence of specific implementation guidelines for online assessments. The findings also indicate that specific online language assessment guidelines and framework is deemed necessary to ensure best educational practices are applied to ensure attainment of course and programme outcomes.

Keywords: *online language assessment, literacy, knowledge management, pandemic*

TEST CASE QUALITY: ISSUES AND LIMITATIONS IN AGILE SOFTWARE DEVELOPMENT

Samera Obaid Barraood^{1,2}, Haslina Mohd.¹ and Fauziah Baharom¹

¹Universiti Utara Malaysia, Malaysia, {samera_obaid@ahsgs.uum.edu.my, haslina@uum.edu.my, fauziah@uum.edu.my }

²Hadhramout University, Hadhramout, Yemen, {sammorahobaid@gmail.com}

Abstract

In the Agile software development environment, continuous changes in user requirements lead to an increase in the importance of a testing process to demonstrate a quality product. As test case is a cornerstone of the testing process, it is important to emphasize the high-quality construction of the test cases. Hence, testing process should be adequately planned and evaluating the quality of test cases can help to explain some important issues associated with software testing. However, findings from literature and the critical analysis of empirical studies revealed that less academic research has investigated the test case quality in Agile software development process. Therefore, with a specific reference to scrum methodology, the purpose of this paper is to identify the problems of test case quality in Agile software development by reviewing the existing work concerning testing quality in Agile. This paper has made a useful contribution by illustrating and clarifying the shortcomings of test case quality in agile projects and pointing out the factors that help to improve it.

Keywords: Agile software development, Agile testing, Scrum, test case quality

IMPACT OF KNOWLEDGE MANAGEMENT, FINANCIAL RESOURCE, INNOVATION, AND FOREIGN DIRECT INVESTMENT ON ENTREPRENEURSHIP

Hui-Shan LEE¹, Shyue-Chuan CHONG², Bik-Kia SIA¹, Ying-Chyi CHOU³ and Wen-Xiu LI⁴

¹Universiti Tunku Abdul Rahman, Malaysia, {hslee@utar.edu.my, siabk@utar.edu.my}

²New Era University College, Malaysia, {shyuechuan.chong@newera.edu.my}

³Tunghai University, Taiwan, {ycchou@thu.edu.tw}

⁴Guangdong University of Finance, China, {lwxasu@126.com}

Abstract

Entrepreneurship is usually opportunity-driven and linked to knowledge management and innovation in increasing competitiveness. However, the 2008-2009 economic crisis has put start-up ecosystems in mortal danger with the phenomenon of the surge in the number of necessity-driven entrepreneurs due to no better work option. The recent “Black Swan” event, Covid-19 is dramatically transforming the landscape of industry and business that will further damper the survival of necessity-driven entrepreneurs. The objective of the present study is to examine the roles of knowledge management, financial resource, innovation, and foreign direct investment on necessity-driven entrepreneurship. By using a sample from 37 countries spanning from the year 2010 to 2016, the panel regression random effect model finds that financial resource is the most critical factor as financial capital supports necessity-driven entrepreneurship in the venture creation process. The results show that knowledge management, innovation, and foreign direct investment are negative and significantly related to necessity-driven entrepreneurship. We also attempt to investigate the interaction between financial resource and knowledge management when analysing the relationship between knowledge management and entrepreneurial outcomes. The impact of knowledge management on necessity-driven entrepreneurship is contingent on the financial resource. The implications of the study reveal that: (1) financial credit from the banks cannot effectively enhance the survivability of the necessity-driven entrepreneurship, which requires government-backed financial and support. (2) the stimulation on innovation and foreign direct investment may not benefit necessity-driven entrepreneurship as it is pushing them towards marginal market niches. (3) In the absence of adequate financial capital, necessity-driven entrepreneurship unable to reap the benefit from the cultivation of knowledge management. Hence, policymakers should ensure commensurate amounts of financial support and knowledge spillovers to reduce bankruptcy risk among necessity-driven entrepreneurs.

Keywords: *Necessity-driven entrepreneurs, knowledge management, financial resource, crowding effect, economic crisis*

STRATEGIES TO ENHANCE COMMERCIALISATION ACTIVITY: RESEARCHER PERSPECTIVE

Nabilla Afzan Abdul Aziz¹, Nurshafiza Ismail¹ and Arif Hartono²

*¹Universiti Teknologi PETRONAS, Malaysia; (nabilla.aziz@utp.edu.my;
shafizaismail95@gmail.com)*

²Universitas Islam Indonesia, Indonesia; (arif.hartono@uii.ic.id)

Abstract

Commercialisation is a platform to recognise the findings of local researchers and develop the reputation of local universities in Malaysia. The purpose of this research study is to gain the perspective of researchers on the factors that facilitate and motivate research commercialisation activity. This study is limited in the setting of Malaysian private university. The study uses quantitative method incorporating questions that is based on a research model developed by the authors. Survey was deployed to the researchers in order to gain their feedbacks and opinion on strategies for commercialisation. The study discovered factors that contribute to the success and failure of product commercialisation in a university setting. In general, majority respondents with more than 80% strongly agree on the need of good marketing and overcome marketing strategy issues highlighted are critical factors that hinders success in commercialisation. Respondents also acknowledged the delineated factors that could enhance commercialisation and the need of professional productivity with 64% and 67% votes respectively. In conclusion, the key issues and challenges in commercialisation by researchers and managing university-industry technology transfer are identified and validated through the responses. These findings are anticipated to equip students, researchers and academia to strategise based on the factors that may impede research commercialisation. Furthermore, commercialization technology could be translated into sales revenue, additional profit, and job creation as tangible item.

Keywords: *commercialisation, researcher, strategies, perspective, factors*

**INSIGHTS OF RESEARCH COMMERCIALISATION THROUGH UNIVERSITY TECHNOLOGY
TRANSFER OFFICE**

Nurshafiza Ismail¹, Nabilla Afzan Abdul Aziz¹ and Arif Hartono²

*¹Universiti Teknologi PETRONAS, Malaysia; (shafizaismail95@gmail.com,
nabilla.aziz@utp.edu.my)*

²Universitas Islam Indonesia, Indonesia; {arif.hartono@uii.ic.id}

Abstract

In university, technology transfer office (TTO) acts as a merger between the industry and academia for research commercialisation activity. The purpose of this research study is to gain insights of TTO on the factors contribute to commercialising research products in a Malaysian university based on Soares et al. (2020) maturity model efficiency for TTO. This includes a sharing experience from TTO handling issues related to the commercialisation. The study uses qualitative method incorporating components in Soares et al. (2020) maturity model efficiency for technology transfer office. Interviews were conducted with the technology transfer office personnel to obtain qualitative findings in terms of organisation management, technology, industry links and networking as a technology management centre. The study discovered insights that contribute to the evolutionary development of technology transfer in a university setting. Active engagement is required between researcher and TTO to unfold and resolve the issues faced in commercialisation. In conclusion, understanding on the market and strategies by TTO determine the success implementation of research commercialisation These findings are anticipated to equip researchers and management in academic setting to strategise based on structure and administration, that leads to efficiency and achievement of the desired goal

Keywords: *technology; transfer; insights; commercialization*

**SENTIMENT ANALYSIS OF ARABIC TWEETS ON THE GREAT MARCH OF RETURN USING
MACHINE LEARNING**

Saad Tareq Daher¹, Ashraf Yunis Maghari¹ and Hussam Fares Abushawish²

¹Islamic University of Gaza, Palestine, {sdaher@iugaza.edu.ps, amaghari@iugaza.edu.ps}

²Digital Palestine Technical College, Palestine, {hussam.as@gmail.com}

Abstract

Social media platforms such as Twitter and Facebook are becoming powerful sources of people's perception of major events. Most people use social media to express their views on various issues and events and develop their information on a diverse economic, political, technical, social and occurrences related to their life. The overarching aim of this paper is to apply machine learning techniques to extract Arab users' opinions from 500 Arabic tweets on the Great March of Return rallies in the Gaza strip (Gaza border protests) collected over a two years span from 2018 to 2019. The majority of Sentiment Analysis (SA) studies concentrate on the English language, while other popular languages, such as Arabic, are seldom covered. In addition, on the Internet, publicly accessible Arabic datasets are hardly found. Three Arabic sentiment analysis datasets were used to train and evaluate four machine learning algorithms, namely, Support Vector Machine, Logistic Regression, Decision Tree, and Neural Network. In term of accuracy, logistic regression outperformed the other three algorithms with a percentage of 83%. Application of logistic regression on the sample tweets revealed that 85.8% of the tweets opposed the Great March of Return, whereas 14.2% of the tweets supported it.

Keywords: *Opinion mining, sentiment analysis, Arabic language, machine learning*

**PREDICTIVE ANALYTICS ON UNIVERSITY STUDENT DROPOUTS FROM ONLINE LEARNING
DUE TO MCO**

***Md Erfan Sultan¹, Mohd Norshahriel Abd Rani¹, Nabilah Filzah Mohd Radzuan¹ and Lim
Huay Yen¹***

*¹INTI International University, Malaysia, {i17012589@student.newinti.edu.my,
mnorshahriel.arani@newinti.edu.my, nabilah.radzuan@newinti.edu.my,
huayyen.lim@newinti.edu.my}*

Abstract

COVID-19 has and have been affecting the lives of millions of people all around the world. Some of which involves in adapting to the work-from-home culture. It is applicable to all individuals who had to perform their tasks from the comfort of their home whether if it is a 9-to-5 job, running a business or students who are continuing their studies. Observations made shown that students have been facing problems when it comes to attending virtual classes. Hence, this study will be focusing on university students comprising of undergraduate, post-graduate and doctorate students who will be dropping out due to internal or external factors. In order to predict the number of students whom will be dropping out during their online studies; using data mining techniques such as classification techniques and prediction algorithms inclusive of K-Nearest Neighbor (KNN), Logistic Regression, Random Forest, Decision Tree, Naïve Bayes, Support Vector Machine and Genetic algorithms. Each of the algorithms will performed their unique features and percentage of accuracy when making predictions. Along with Association Rule mining such as the Apriori algorithm to identify the causes and effects between the identified factors. The testing data collection will be done manually via questionnaires distributed to students who are currently pursuing their online studies. Key factors involved in this study are age, financial, motivational factors and many more. The key beneficiary from this project will be educational institutions (major) concerned by their ratings, number of dropouts or even a significantly lesser number of student enrolling whether new or returning. The minor audience are the higher education students.

Keywords: Data Analytics, Predictive Analytics, Classification, Association Rule Mining, Data Mining, Algorithm, Higher Education, Student, Dropout

**ASSESSING THE READINESS OF HIGHER EDUCATION INSTITUTION (HEI) IN MALAYSIA TO
ACCEPT GENERATION ALPHA USING PREDICTIVE ANALYTICS**

Tan Lik Wei¹, Mohd Norshahriel Abd Rani¹, and Nabilah Filzah Mohd Radzuan¹

*¹INTI International University, Malaysia, {i17012619@student.newinti.edu.my,
mnorshahriel.arani@newinti.edu.my, nabilah.radzuan@newinti.edu.my}*

Abstract

The impact of technology in education is getting more common. In the UK, most of the children start to learn coding skills from the age of 5. Generation Alpha will be very different from traditional college students. Technologies will be largely driven in education and educators need to learn how to adapt to it. The traditional method of teaching and learning might not be effective and efficient for Generation Alpha. Institutional culture needs to be changed to prepare the arrival of Generation Alpha students. In a technology-driven period, students need to learn problem solving skills to help themselves how to think not what to think, and collaboration skills to collaborate with peers around the world. What will the Generation Alpha students behave in higher education? How to define that an institution is ready to accept Generation Alpha? These questions can be answered by finding the unique pattern of generation z using predictive analytics. This research is focus on develop a dashboard system in assist decision making for the higher education institution. The dashboard system will allow Higher Education Institution (HEI) to capture and analyze useful insights and improve decision making from the student data. K-nearest Neighbours (KNN), Support Vector Machine (SVM), and XGBoost are data mining techniques are implemented in order to develop the prediction analytics model. The testing will be conduct for analysis and evaluation of the system.

Keywords: generation alpha, higher education institution, supervised learning, data mining, KNN, SVM, XGBoost.

A COMPARISON STUDY OF SOFTWARE TESTING ACTIVITIES IN AGILE METHODS

Samera Obaid Barraood^{1,2}, Haslina Mohd.¹ and Fauziah Baharom¹

¹Universiti Utara Malaysia, Malaysia, {samera_obaid@ahsgs.uum.edu.my, haslina@uum.edu.my, fauziah@uum.edu.my }

²Hadhramout University, Hadhramout, Yemen, {sammorahobaid@gmail.com}

Abstract

Nowadays the majority of companies in the world are adopting Agile methodology for developing their software products due to the methodology promises to deliver product faster with good quality. The most significant method for checking the quality of a product is software testing. However, in Agile development, software testing is very complex and still has challenges. This is largely happened because the Agile development does not concentrate much on software testing activities. It focuses on customer involvement, short iterations, and regular deliveries. This study is a comprehensive review of the current practices of software testing in the Agile methods. The comparison is made based on some criteria such as change during iteration, acceptance criteria, and quality assurance activities. The aim is to identify the similarities and differences between these methods especially in creating test cases. The study focuses on three common Agile methods which are XP, Scrum and Kanban. The review shows no difference in the techniques for designing test cases between these three methods. This result can contribute to help the developers and testers who adopt Agile methodology to follow the same rule of creating test cases based on the suitable technique in different Agile methods.

Keywords: Agile methods, Scrum, Extreme programming, Kanban, Agile testing, Test cases

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ANALYSIS OF SPACE MANAGEMENT FOLLOWING THE SUCCESSFUL TRANSFORMATION OF THE MALAYSIA AGRICULTURE EXPO PARK SERDANG (MAEPS) INTO A LOW RISK COVID-19 QUARANTINE AND TREATMENT CENTRE

Siti Aisyah Muhammad¹, Tengku Fauzan Tengku Anuar², Nur Athmar Hashim³, and Hequan Zhang⁴

^{1,2,3} Universiti Malaysia Kelantan, {aisyah@umk.edu.my, tengkufauzan@umk.edu.my, athmar.h@umk.edu.my, hana.h@umk.edu.my, najah.ma@umk.edu.my }

⁶Communication University of Zhejiang, Hangzhou 310018, China {20170011@cuz.edu.cn}

Abstract

The conversion of the Malaysia Agriculture Expo Park Serdang (MAEPS) is the fastest built Low Risk COVID-19 Quarantine and Treatment Centre catering for the predicted overflow of COVID-19 patients in Malaysia. This study examined the reasons for the successful transformation, as well as identified the building characteristics that allowed spaces to be selected as sites for a Low Risk COVID-19 quarantine and treatment centre. The methodology employed was a qualitative analysis of secondary resources, a site observation at MAEPS, and a focus group interview. The findings indicated that the architecture of MAEPS, especially Hall A, contributed to the successful transformation through the design of a columnless interior and positive cooperation and the sharing of expertise between the parties involved. The results enhance our understanding of architectural influences on social needs and space conversion. The management of the team and compliance with the guidelines and procedures of pandemic management led to a successful transformation within a short period of time.

Keywords: Covid-19, MAEPS, space transformation, quarantine

**A REVIEW ON USABILITY REQUIREMENTS OF VISUALLY IMPAIRED USERS FOR ACCESSIBLE
E-BOOK APPLICATIONS**

Munya Saleh Ba Matraf^{1,2}, Nor Laily Hashim¹ and Azham Hussain¹

¹Human-Centered Computing Research Lab, School of Computing, Universiti Utara Malaysia, Malaysia, {m_saleh_saeed@ahsgs.uum.edu.my, laily@uum.edu.my, Azham.h@uum.edu.my}

²Hadhramout University, Yemen, {munyabamatraf@gmail.com}

Abstract

An e-book is basically a book in electronic or digital format that is significant and beneficial for readers who cannot access print books, such as the visually impaired. An accessible e-book is one that allows the visually impaired to use it and achieve the same intended benefits as those who are normal. However, current e-book applications are not practical for users with vision disabilities. With the increased demand for e-books, it becomes even more important to design usable and accessible e-book interfaces for users with vision impairments. This paper hence aims to conduct a review on the usability requirements of accessible e-book applications for the visually impaired. For this purpose, the authors applied an intensive review of current works from 2010 to 2020 that focus on the development and evaluation of e-book usability and accessibility. This study also reviewed general accessibility requirements and guidelines for mobile applications. In total, 24 usability requirements were identified. As the main purpose of the usability evaluation is to determine whether the users' needs are met, and to identify the needs of the visually impaired that can guarantee that those needs are introduced into their e-book applications.

Keywords: Accessibility, visually impaired, e-book Apps, usability requirements

KNOWLEDGE MANAGEMENT IN PANDEMICS: DESIGN AND IMPLEMENTATION OF SOCIAL DISTANCING MOBILE APPLICATION

Rabi Mustapha¹, Muhammed Auwal Ahmed² and Muhammad Aminu Ahmad³

*^{1,3} Department of Computer Science, Kaduna State University, Nigeria
{rabichubu@gmail.com, {muhdaminu@kasu.edu.ng}}*

*² Department of Computer Science, Kaduna Polytechnic, Kaduna, Nigeria
{horare10@gmail.com}*

Abstract

Pandemics naturally are difficult to eradicate completely because of its long span but can easily be managed. The COVID-19 pandemic has forced individuals/decision-makers globally to have knowledge in its management. Despite measures taken to curtail the spread of the virus in Nigeria particularly in Kaduna state, there is no social distancing app developed as one of the strategies to curtail the spread of the virus in the state. Hence, this paper describes one of the management measures that can be enforced by the Kaduna state government (KDSG) to reduce the spread of the coronavirus in the state by designing and implementing a Social Distancing Mobile App called Kaduna trace (KDTRACE) for the state citizens. To achieved this, a flutter written in DART programming language is used for the frontend design while firebase is used for the backend design. The result will be the designed app for the iOS, Android, and cloud-based that will be pushed into Git hub repository for private use and will the uploaded to google play store for public consumption on completion. The extension of the app to handle contact tracing of the citizens with the virus in the state will be the future work of this study.

Keywords: Knowledge management, Pandemic, COVID-19, Social Distancing, Mobile App

**DATA VISUALIZATION FOR MULTIMEDIA SUPER CORRIDOR MALAYSIA USING DOT
DISTRIBUTION MAPS**

Mohd Suffian Sulaiman¹, Amira Yasmin Raimy¹, Azri Azmi²

¹*Universiti Teknologi MARA, Malaysia {suffian@tmsk.uitm.edu.my,
amira.yasmin0510@gmail.com}*

²*Universiti Teknologi Malaysia, Malaysia {azriazmi@utm.my}*

Abstract

Multimedia Super Corridor (MSC) is a Malaysian government designated zone developed as a catalyst for the advancement of the information and communication technology (ICT). Currently, the locations of each MSC Malaysia status companies are represented in a list. Thus, it is time-consuming and inconvenient for users to go through a list of 3213 of MSC Malaysia companies. This study proposed to develop a webpage application to visualize the locations of MSC Malaysia companies in Klang Valley using dot distribution maps technique. Google Maps Javascript API is used to display the map in the webpage application. The data of the companies are collected and reorganized with additional information. The webpage application also utilizes markers as symbols to display the exact location of the MSC Malaysia companies. Besides, the tooltips feature is also included. Pan and zoom control features are provided by Google Maps Javascript API. From the result of system testing, it shows that the webpage application functions, work properly and the locations of MSC Malaysia companies are presented in a more understandable way in which ease for users to search for the exact location. By applying dot distribution maps technique, the users can easily view and identify the locations of MSC Malaysia companies in Klang Valley.

Keywords: Data Visualization, JavaScript, Multimedia Super Corridor, Dot distribution maps, API

“DO YOU TRUST ME?” - THE OUTLOOK OF BELIEF, DESIRE AND INTENTION IN THE FOURTH INDUSTRIAL REVOLUTION

Shahrinaz Ismail¹, Nordiana Jamaludin² and Salama A Mostafa³

¹Universiti Kuala Lumpur (UniKL), Malaysian Institute of Information Technology (MIIT), Malaysia {shahrinaz@unikl.edu.my}

²Management & Science University (MSU), Malaysia {nordiana_jamaludin@msu.edu.my}

³Universiti Tun Hussein Onn, Malaysia {salama@uthm.edu.my}

Abstract

Trust has been a barrier towards technology implementation, despite the benefits that technology promises to provide humanity since the emergence of the Internet. Nevertheless, the technology facilitates the current situation when there is a need to work from home (WFH). WFH has become a new norm across borders due to the COVID-19 pandemic in 2020. Many organisations have opted to shift their operations to virtual environment instead of physically being at offices formally, temporarily or permanently in future. Business owners, managers and supervisors feel the needs to keep track of each subordinate’s work progress and have used many tools available in the market for reporting and record keeping process. It is believed that intelligent software agents with the belief-desire-intention (BDI) model could assist both parties – employers and employees – and at the same time reduce stress and the feeling of insecurity among employees by improving trust between both parties. This research looks into the possibility of embedding intelligent software agents into the work progress reporting system that is scattered within an organisation. Five organisations were investigated from the perspective of respondents at operational level, and a proposed Detect-Determine-Direct (3D) Framework for work progress reporting automation is presented. This framework is based on the BDI Model found implementable in intelligent software agents, hence bringing out the significance of automation in work progress reporting without relying on specific systems. The reporting automation at operational level that could reduce trust issues is deemed significant towards a positive impact on the overall supply chain in IR4.0, especially during the pandemic crisis.

Keywords: Intelligent software agent, BDI model, 3D framework, work progress reporting, humanity

USABILITY EVALUATION FACTORS IN ACQUIRING KNOWLEDGE THROUGH MOBILE E-BOOK APPLICATIONS BY VISUALLY IMPAIRED USERS

Munya Saleh Ba Matraf^{1,2}, Nor Laily Hashim¹ and Azham Hussain¹

¹Human-Centered Computing Research Lab, School of Computing, Universiti Utara Malaysia, 06010, Malaysia, {m_saleh_saeed@ahsgs.uum.edu.my, laily@uum.edu.my, azham.h@uum.edu.my}

²Hadhramout University, Yemen, {munyabamatraf@gmail.com}

Abstract

People read for various purposes, for example, to find data, interpret text, and acquire new knowledge. Electronic book (e-book) provides new opportunities to the visually impaired (VI) to read and learn and acquired knowledge at the same time as sighted people do. The e-book is an alternative to the traditional reading methods for the VI because it provides features like text enlargement and read aloud. However, the current mobile e-book applications are still not reaching their satisfactory level. Besides, usability evaluation studies for these applications are not clear in terms of factors used in the evaluation. Therefore, this study aims to identify the factors involved in a usability evaluation to evaluate e-book applications for the VI. Hence, the study applied a literature review to identify the usability factors that may use in the evaluation of e-book applications designed especially for VI. In total, 36 factors were identified but the study proposed six factors namely Efficiency, Effectiveness, Satisfaction, Learnability, Accessibility, and Navigation for the usability evaluation of accessible mobile e-book applications for VI to ensure that these applications are usable and accessible by them and will guarantee acquiring knowledge in an effective way.

Keywords: Acquiring Knowledge, e-book application, usability factors, visually impaired

EXPLORING THE SIGNIFICANCE OF IOT-ENABLED HEALTH MONITORING AND ASSISTIVE SYSTEMS FOR ELDERLY NCD PATIENTS IN MALAYSIA

Chinnasamy Malarvizhi¹ and Shamima Raihan Manzoor¹

¹Multimedia University, Cyberjaya Malaysia, {malarvizhi@mmu.edu.my, shamimaraihanmanzoor@gmail.com}

Abstract

Apparently, it might show that for elderly people staying at their own house can be the main secured center for them in order to reduce health hazards. In this regard, the improvement of connected devices has had a remarkable effect upon the entire healthcare sector and has been noticeably appreciated in remote clinical monitoring, chronic disease management, preventive care, and assisted living. This study intends to explore the significance of IoT particularly wearable technology and digital healthcare for senior patients of non-communicable diseases (NCD). The study also discusses several benefits of IoT like reducing cost, raising quality for the healthcare service providers in Malaysia including a higher level of success, productivity, and precision of health monitoring and treatment systems. Based on effective knowledge management as the key strategy in this regard, the insights of this study will help the elderly community and healthcare providers to recognise the use of IoT Enabled Health Monitoring and Assistive Systems and their significant contribution to improving healthcare for the country in the long run.

Keywords: IoT, Healthcare, NCD, Elderly patients, Malaysia

**TOWARDS CENTRAL REPOSITORY DESIGN FOR DOMAIN OF INTERLOCKING INSTITUTIONAL
WORLDS: SUCCESSFUL COLLABORATION STARTS WITH A SHARING PLATFORM**

**Mohd Ismawira Mohd Ismail¹, Nor Hidayati Zakaria¹, Mohammad Nazir Ahmad² and
Kamarul Faizal Hashim³**

¹Universiti Teknologi Malaysia, {wira@i-erat.com, hidayati@utm.my}

²Institute of IR4.0, Universiti Kebangsaan Malaysia, {mnazir@ukm.edu.my}

³University of Dubai, {kbinhashim@ud.ac.ae}

Abstract

Creating and organizing disaster knowledge into a common platform from various agencies and sources is vital to the enhancement of disaster management efforts. Prominent leading disaster relief organizations including the European Union, Federal Emergency Management Agency, United Nation, World Health Organization (WHO), National Disaster Management Agency, and National Disaster Management Agency (NADMA) have acknowledged integrated effort as a fundamental element to address disaster. However, despite the increasing data availability, challenges in terms of data interoperability and incompatible data still persist. This paper highlights the importance of a Central Repository (CR) design that supports knowledge and best practices in sharing in disaster management strategies, and discusses key lessons learned from 22 countries in their effort to improve data collection, interoperability, and sharing capabilities. Therefore, through this paper, we hope to fill the gap by aiming at increasing the effectiveness of interlocking inter-agency's institutional worlds which lead to information and knowledge sharing.

Keywords: Central repository design, Interlocking Institutional Worlds, Knowledge sharing, Flood management

**VERIFICATION OF AN INTEGRATED COMPUTATIONAL MODEL OF SELF-EFFICACY,
MOTIVATION AND ANXIETY FOR A HUMAN MENTAL STATE**

Naseer Sanni Ajoge¹, Azizi Ab Aziz² and Shahrul Azmi Mohd Yusof²

¹Kaduna Polytechnic, Kaduna, Nigeria, {ajogenass@kadunapolytechnic.edu.ng}

²Universiti Utara Malaysia, Malaysia, {aziziaziz@uum.edu.my, shahrulazmi@uum.edu.my}

Abstract

Knowledge acquisition has been considered a major bottleneck in the development of knowledge base systems. This problem can be narrowed through the development of models that helps in defining the set of knowledge to be acquired from domain experts, hence decrementing unfruitful knowledge elicitation efforts. The constructs of self-efficacy, motivation, and anxiety have been established to define human mental states leading to behavioural complexities in the selected domain. Current researches in the field of human-centred AI are beginning to formally represent these constructs as leeway to building systems that understand human complexities. However, in order to ensure that the solutions of such computational models comply with the conceptual description of the theoretical foundations of the constructs, the models must be evaluated. This paper applied two techniques of mathematical analysis and automatic verification using Temporal Trace Language (TTL) for the verification of the formalized integrated model of the constructs. The formalized integrated model is suitable for further validation using a human experiment. The results will serve as the first stage into the computational understanding of the human state influence for knowledge elicitation.

Keywords: formal model, human-aware system, mental state, knowledge acquisition, model verification

AGILE APPROACH AND ADAPTABILITY INTO COMPLEX ENVIRONMENT MANAGEMENT AND OPERATION: A CASE OF MALAYSIA BATTLEMENT AGAINST COVID-19

Mohamad Firdaus Mat Saad¹ and Aliza Abdul Latif²

¹Segi University and Colleges {firdausmatsaad@segi.edu.my}

²Universiti Tenaga Nasional {aliza@uniten.edu.my}

Abstract

Covid-19 disaster management is classified as complex management due to the rapid changes of the current situation, ad-hoc methods in the dissemination of latest information to society and public knowledge, mass media control, collaboration and coordination between agencies, national economic stability, and finances that contributes to the operation complexities. Several solutions have been made by the federal or state government involving various aspects, including the development of standard operating procedures that form the basis of overall management. However, not all efforts can run smoothly and efficiently given the large aspects of control and the involvement of a large population. Therefore, in this paper, we propose for the agile process in the agile framework for flood management to be adapted to provide new solutions for Covid-19 to cater to the activity's complexity. The grounded theory is applied to construct the structure of the study by understanding the phenomena from multiple complex environments and established theories. Consequently, the suitability of the agile elements from flood management has shown a constructive relationship to be adopted into Covid-19 operational activities to support complex environmental processes.

Keywords: Covid-19, agile approach, complex environment, disaster management

**DESIGN AND DEVELOPMENT OF QURANIC PARABLES INFORMATION SYSTEM: A WEB
BASED SYSTEM FOR UNDERSTANDING QURAN VERSES**

***Shakir Zufayri Osman¹, Shafinah Farvin Packeer Mohamed²
and Syed Sultan Bee Packeer Mohamed³***

*^{1,2}School of Computing, Universiti Utara Malaysia, Malaysia {shakirzufayri95@gmail.com,
shafinah@uum.edu.my}*

*³School of Language, Civilization and Phylosophy, Universiti Utara Malaysia
{ss.bee@uum.edu.my}
Universiti Utara Malaysia, MALAYSIA*

Abstract

The content of al-Quran needs to be read, observed, and understood so that it can be practiced. Nevertheless, today's generation put less emphasis on understanding the content, rather they only read al-Quran without understanding the meaning behind it. This has caused a lot of immoral activities. Besides, the Islamic content learning media is claimed to be dry and not attractive enough. Thus, this study is conducted with the aim to attract the young generations' interest on understanding al-Quran content by using the current technology: through a web-based system named as Quranic Parables Information System (QPIS). QPIS provides verses in the al-Quran, which contains parables and their interpretation. The design and development of QPIS followed Rapid Application Development (RAD) methodology. The evaluation towards the completed system received positive feedback from users as all of the content and functionality of the system works accordingly and fully serve its purposes and more importantly the feedback indicates that QPIS is able to help users substantially in understanding Quranic parables. The study contributes by providing an understanding about the system requirements modelling on QPIS, which can be referred by researchers in the same interest. More importantly, QPIS will enable the young Muslims to understand and practice the Quran content in their daily lives.

Keywords: Quranic parables, System design and development

WASTEBOT: CONCEPTUAL DESIGN OF SMART BIN AND WEB SERVICE FOR IOT WASTE MANAGEMENT SYSTEM

Manmeet Mahinderjit Singh, Wong Khang Siang, Nor Saralya Azwa Kamaruddin, Muhammad Rafie Mohd Arshad, Mohd Halim Mohd Noor, Nur Intan Raihana Ruhaiyem
Universiti Sains Malaysia, Malaysia, {manmeet@usm.my, wongkhangsiang@gmail.com, lynaazwa@student.usm.my, rafie@usm.my, halimnoor@usm.my, intanraihana@usm.my}

Abstract

A green and clean environment has become one of the most concerning issues in our society, especially when environmental pollution cases are on the rise. Everyone wants to live in a clean environment to minimize the risk of getting any diseases because of the dirty environment. The initiative to have a better living environment for our future has to start within our community. Therefore, this paper introduces an Internet of Things (IoT) Waste Management System, WasteBOT with two easily attachable and detachable embedded sensing modules and a web service platform. The embedded sensing modules able to turn any wastebin into a smart wastebin with sensing capabilities to collect the bin status such as waste level and environmental data such as temperature. The conceptual hardware design of the embedded sensing modules is presented with a real prototype using microcontrollers and different sensors. The collected data will be upload to the server using Wi-Fi. The web service platform processes the collected data and provides monitoring and navigation services to different categories of users such as waste management companies and normal users. The WasteBOT system with the embedded sensing modules will help everyone to easily join in the effort to keep a clean environment in the society without the need to replace a conventional wastebin with a brand-new smart bin.

Keywords: internet of things, waste management, smart bin, embedded system, web service

SYSTEM DYNAMICS MODEL FOR FINANCIAL MANAGEMENT AMONG UNIVERSITY STUDENTS

Che Rohayu Darlynie Che Mohd Khalid¹, Hasimah Sapiri¹, Masnita Misiran¹ and Zahayu Md Yusof¹

¹Universiti Utara Malaysia, Malaysia, {ayudarlynie@gmail.com, hasimah@uum.edu.my, masnita@uum.edu.my, zahayu@uum.edu.my}

Abstract

Financial management defined as behaviour and perceptions about how financial is managed. Lack of sufficient knowledge on financial management will produce low savings, no budgeting, and failure to service debts on time and make impulsive buys. Low financial knowledge strongly resulted to higher level of debts. It is an urgency for Malaysians to improve their financial knowledge to improve their spending and investment habits especially among young adults. However, good practice of personal finances among students in Malaysia is still low whereby university students are found to have difficulties in managing their financial source. Therefore, the aim of this study is to assess university students' financial management skills. This study determines factors that influence the financial situation and examine consequences of financial situation for university students. Data were collected among university students and system dynamics model was developed using Vensim Software. The results revealed factors that associated with financial situation are financial knowledge and financial skills. The model indicated that the impact on increasing the number of people that fails to manage future need caused by financial knowledge factor, will cause a decline in the number of people that are aware about their financial management, and vice versa.

Keywords: *Financial management, financial knowledge, system dynamics*

**THE DEVELOPMENT OF AN E-DRIVER: CREATING AWARENESS OF ETHICS IN DRIVING VIA
GAME-BASED LEARNING**

**Muhammad Syafiq Saharudin¹, Ismassabah Ismail², Norzilah Musa²,
Zainab Othman³ and Nurul Hidayah Mat Zain³**

²Centre of Foundation Studies, Universiti Teknologi MARA, Malaysia,
{ismassabah@uitm.edu.my,norzi105@uitm.edu.m}

^{1,3}Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Malaysia,
{syafiqsaharudin@gmail.com, zainab_othman@uitm.edu.my, nurul417@uitm.edu.my}

Abstract

Ethics in driving should be followed in reducing the number of road accidents. According to the research, most of the road accidents in Malaysia are caused by not following driving ethics and unethical drivers. This study aims to develop a game-based learning application for driving ethics awareness (e-Driver) and implement the ADDIE model to provide a stable and effective development process. The evaluation phase adopted the Technology Acceptance Model (TAM) that involved 20 respondents and produced 82% of the acceptability. The findings suggest that the application is enjoyable and effective in delivering the instructions for creating awareness of driving ethics. The impact of morality in driving will create a safe and systematic traffic environment since most road users respect others' rights to road usage.

Keywords: *ADDIE, Ethics, Game Based Learning, User Acceptance Testing*

STRENGTHENING CURRICULUM STRUCTURE OF SOFTWARE ENGINEERING PROGRAMME

Yanti Rosmunie Bujang¹, Wang Hui Hui¹, Nurfaeza Jali¹, Tan Ping Ping¹, Edwin Mit¹, Azman Bujang Masli¹, Cheah Wai Shiang¹, Abdul Rahman Mat¹, Norazian binti Mohamad Hamdan¹, Mohamad Johan bin Ahmad Khiri¹, Wee Bui Lin¹, Eaqerzilla Phang¹ and Mohamad Asyraf bin Khairuddin¹

¹Faculty of Computer Science and Information Technology, Universiti Malaysia Sarawak, Malaysia, {byanti@unimas.my, hhwang@unimas.my, jnurfaeza@unimas.my, pptan@unimas.my, edwin@unimas.my, bmazman@unimas.my, wscheah@unimas.my, marahman@unimas.my, mhnorazian@unimas.my, akmjohan@unimas.my, blwee@unimas.my, eqzla@unimas.my and kmasyraf@unimas.my}

Abstract

The rapid development of technology has changed the world with various computer-based inventions and innovations. Education from primary to tertiary level is no exception in facing this change. With the curriculum changes that have begun to introduce courses related to programming at the primary and secondary level, the tertiary level curriculum should also change for quality education. This paper presents a new curriculum structure for the Software Engineering Undergraduate Program at University Malaysia Sarawak (UNIMAS). The current structure of Software Engineering programme does not follow the Malaysian Qualifications Agency (MQA) Programme Standards. The objective of this paper is to develop a new curriculum structure of Bachelor of Software Engineering based on MQA. The processes involved data collection, document analysis, and meeting with industries to restructure the curriculum. As a result, four new courses have been added to the new curriculum structure the Bachelor of Software Engineering programme for improvements. It is hoped that the graduates from this programme will fulfil the job skills and knowledge as required by the current industries.

Keywords: Software Engineering, curriculum, industry, students, quality education

PERCEPTION AND USAGE OF CLOUD STORAGE FOR E-LEARNING IN UNIVERSITY OF SAMARRA STAFF DURING THE PERIOD OF COVID-19 PANDEMIC: A PILOT STUDY

Omar Hamid Flayyih¹ and Husam Abdulhameed Hussein²

¹Ministry of Education, Iraq, {omarhamid@uosamarra.edu.iq}

²University of Samarra, Iraq, {husam.hs24@uosamarra.edu.iq}

Abstract

Cloud storage is one of the proliferated technology that supports various enterprises. It has been demonstrated as a highly efficient tool in E-learning. However, cloud storage faced several problems like size limitation and negative data repetition. Similarly, the first usage of E-learning has storage issues recorded in University of Samarra (UOS) during the COVID-19 pandemic which forced lots of universities globally to take urgent measures. Many users have complained about facing difficulty to store the cloud storage data. UOS staff faced hardness in data management resulting from over-sized, duplicated files that overwhelmed the storage capacity. This research aims at investigating the staff's perception concerning the usage of cloud storage by surveying the UOS staff's opinions. A pilot study was conducted on 37 staff who work on E-learning data management by a self-administrated questionnaire using five-point Likert scales. The questionnaire was divided into three sections: cloud storage awareness, current issues, and proposed solutions. As a result, the staff are rather aware of data management as storing and retrieving. The management process was constrained by big, duplicated image files which improperly replaced the text files. The study resulted in high acceptance of utilizing more cloud capabilities and readiness for more training to improve the proficiency of using UOS cloud storage. This study believes that the result will be of considerable benefit for the UOS staff in terms of making cloud storage more reliable and functioning. It could be also a useful guideline utilized by universities in such conditions.

Keywords: Cloud storage usage perception, Cloud-based E-learning, Cloud storage file duplication, Limitation capacity in cloud storage

DEVELOPING AN EVALUATION FRAMEWORK FOR IMMERSIVE LEARNING EXPERIENCES FOR SOFTWARE ENGINEERING PROJECT COURSE

Nurfauza Jali, Norazian Mohamad Hamdan, Cheah Wai Shiang, and Suriati Khartini Jali
Universiti Malaysia Sarawak, Malaysia, {jnurfauza@unimas.my, mhnorazian@unimas.my, wscheah@unimas.my, jskhartini@unimas.my}

Abstract

Most of the principles and concepts that need to be taught in Software Engineering courses are hard to share the realistic experiences because it is difficult to give the student practical exposure to the insight and processes involved. There is a non-existent approach to conveying the concepts of applying Agile Scrum and Team Software Process (TSPi) that involve learner, instructor, and business stakeholder. This paper will explain the concept of a framework for efficiently building an immersive learning environment for both learner and instructor of Software Engineering Project course with the involvement of business stakeholder. This provides an opportunity for learning to be more focused on learning design through the prism of immersive environments rather than the collection of information. The online surveys were disseminated to third-year students who took the Software Engineering Laboratory course and the projects' stakeholders. This study aims to gain feedback from both sides on the effectiveness and suitability of the framework and concept in teaching and learning the course. Our experience in the creation, conduct, and iteration of the course is outlined in this paper. It ends by assessing the degree to which we were able to achieve the course objectives established by the students and stakeholders.

Keywords: software engineering, software development, immersive learning, stakeholder, business

**A SYSTEMATIC LITERATURE REVIEW: THE CONCEPTUAL OF EDUCATIONAL GAME DESIGN
WITH AUGMENTED REALITY**

***Irma Shayana Samaden¹, Ibrahim Ahmad², Mohd Edzwan Zahri³, Sazilah Salam² and
Ismahafezi Ismail¹***

*¹Universiti Sultan Zainal Abidin, Malaysia, {irma@unisza.edu.my,
ismahafezi@unisza.edu.my}*

²Universiti Teknikal Malaysia, Malaysia {ibrahim@utem.edu.my, sazilah@utem.edu.my}

³Universiti Teknologi Mara, Malaysia {muhammadazwan@gmail.com}

Abstract

Augmented Reality educational game was a combination of real, virtual worlds, and computer-generated virtual objects in real-time with education. According to the most common definitions, augmented reality is the technology that has three key requirements: 1. combining of real, and virtual objects in a real environment, 2. aligning of real, and virtual objects with each other in real-time interaction, and 3. one educational medium increasingly accessible to users. Therefore, this article explains a systematic literature review (SLR) methodology and concept to educational game design in augmented reality applications. The review studies include filtering relevant information on augmented reality and education game design from four databases to answer research questions. A total of 111 primary studies published between 2016 to 2020 were used in the analysis. The literature review shows that most authors focusing on the methodology, genre, tool, classification of augmented reality, and the device's interface game design. In conclusion, we hope the augmented reality in educational game design can be further inspiring and expanded by combining more knowledge and skills.

Keywords: Augmented Reality, Educational Games, Systematic Literature Review

AUTOMATED FISH EGG COUNTING SYSTEM USING IMAGE PROCESSING

Nor Hazlyna Harun¹, Nooraini Yusof², Mohamad Ghozali Hassan¹ and Maizatul Fatimah Binti Mohd Salleh¹

¹*Universiti Utara Malaysia, Malaysia, {hazlyna@uum.edu, ghozali@uum.edu.my, m_fatihah_mohd@soc.uum.edu.my}*

²*Department of Data Science Universiti Malaysia Kelantan, City Campus, 16100 Kota Bharu, Kelantan, Malaysia, {nooraini.y@umk.edu.my}*

Abstract

The fish industry is a source of income for fish breeders. Fish egg selection is one of the important aspects in determining the quantity of fish eggs. The quantity of fish eggs purchased from practitioner may be insufficient due to undetected poor quality of fish eggs. Hence, this study focuses on automated fish egg counting system using image processing method utilizing k-means algorithm. The image of fish egg are captured and processed to calculate the total number of fish egg automatically. The results demonstrate good potential use of the proposed automated counting system with accuracy up to 99.41%. Furthermore, with the proposed automated counting, the manual counting time can be reduced to an average time of 1.29 seconds. This could benefit the fish breeding industry in screening good quality of eggs automatically.

Keywords: *automated counting system, image processing, fish egg, k-means algorithm*

**KNOWLEDGE SHARING ON THE ACCEPTANCE OF SMART WASTE MANAGEMENT SYSTEM:
MODERATING EFFECTS OF LOCAL CULTURES**

***Mohd Khairul Maswan Mohd Redzuan¹, Norshita Mat Nayan¹, Mohammad Nazir Ahmad¹
and Nor Hazila Mohd Zain²***

¹Institute of IR4.0, Universiti Kebangsaan Malaysia, Malaysia,

{khairul_maswan@yahoo.com, norshitaivi@ukm.edu.my, mnazir@ukm.edu.my}

²Faculty of Business, Information and Human Sciences, Infrastructure University Kuala Lumpur, Kajang, Selangor, Malaysia, {norhazila@iukl.edu.my}

Abstract

Smart cities utilize information and communication technologies (ICTs) to increase operational efficiency and effectiveness and share information with the public with the aim of improving government services, citizen welfare, and overall quality of urban life. Based on previous studies, the results of the implementation of ICTs are different from one city to another. It was found that in some cities, the implementation was successful, while in others, it was not as successful. This phenomenon often raises the question as to what the main cause of success or failure is, of the implementation and acceptance of technology in society. Various factors can influence success in the adoption of technology. The issue of waste management is one the biggest challenges to local authorities of both small and large cities. It is an important question that needs to be investigated in academic research, regarding the potential of smart cities in remediating environmental problems in general and waste management. In this paper, we focus on governance in using the Smart Waste Management System (SWMS) for waste management. The successes of Smart Waste Management System (SWMS) may be attributed to many factors. We are concerned with cultural roles, mainly on what we term as "local culture" (LC) elements of SWMS acceptance. The main focus of this paper is based on Hofstede's Onion Model and adopted in the proposed model: Knowledge Culture, Basic Assumption Culture, and Beliefs Culture.

Keywords: Smart Waste, Adoption, Cultural factors

**THE CURRENT PRACTICES AND REQUIRED KNOWLEDGE FOR NON-FUNCTIONAL
REQUIREMENTS ELICITATION IN AGILE CONTEXT: A PILOT STUDY IN JORDAN**

***Mohammed Saleh, Fauziah Baharom, Shafinah Farvin Packeer Mohamed and Aniza
Mohamed Din***

*Universiti Utara Malaysia, Malaysia, {m.rawajfeh@yahoo.com, fauziah@uum.edu.my,
shafinah@uum.edu.my, anizamd@uum.edu.my}*

Abstract

The Non-Functional Requirements (NFRs) are very important since they play a significant role for the system's behavior. However, in Agile methods, the NFRs are overlooked until the later steps of software development and currently there are no standardized guidelines for NFRs elicitation in the early phases of agile requirements elicitation. Moreover, empirical studies on the current practices of NFRs elicitation in Agile software development organizations, specifically focused on security requirements elicitation is still lacking. Besides, there are limited studies on the required knowledge for NFRs elicitation. Therefore, this study was conducted to address the abovementioned lacking issues. To the best of our knowledge, this work has never been done before in Jordan context. Thus, this study was conducted there. This paper presents the result from a pilot study that involves 34 Agile software practitioners in Jordan. The questionnaire was distributed through online interviews and face-to-face communication, while the data was analyzed using descriptive statistical analysis. The items of the questionnaire were highly reliable to be utilized for more analysis. The outcomes of the pilot study defined the current practices for NFRs elicitation, especially for security requirements elicitation, besides the required knowledge for NFRs elicitation. They will be used for formulating guideline for NFRs elicitation.

Keywords: Agile requirements engineering, Non-functional requirements, NFR elicitation guideline, Required knowledge

PERSONAL KNOWLEDGE ACQUISITION: DO EDUCATORS ACQUIRE NEW KNOWLEDGE DURING THE MOVEMENT CONTROL ORDER?

Dewi-Izzwi, A. M.¹, Kalsom Salleh², Jamaliah Said³ and Muhamad Nizam Jali⁴

¹Kolej Universiti Poly-Tech MARA, Malaysia, {dewi@kuptm.edu.my}

²Malaysian Institute of Accountants, Malaysia, {mdchom@gmail.com}

³Accounting Research Institute, UiTM, Malaysia, {jamaliah533@uitm.edu.my}

⁴Institute of Graduate Studies, Kolej Universiti Poly-Tech MARA, Malaysia, {nizam@kuptm.edu.my}

Abstract

The pandemic COVID-19 leads to the online teaching and assessment methods to be adopted by the education institutions in Malaysia. In response to this, questions are raised in terms of whether educators can acquire new knowledge, what new knowledge they gained, and whether demographic profile matters. Online survey was conducted where 151 responses from educators in Malaysia were analyzed. Result shows that majority of the respondents admitted of gaining new knowledge during the MCO period. Furthermore, personal knowledge acquisition does differ in terms of gender, academic qualification, and years of experience. As for what knowledge they gained, thematic content analysis showed that educators learned technical, non-technical, and spiritual knowledge. This research could contribute to the knowledge management process of education institution in Malaysia.

Keywords: COVID-19 pandemic, knowledge management, training and development, education, adversarial growth

ROUTE PLANNING MOBILE APPLICATION IN TRANSPORTATION MANAGEMENT

Ong Xun Sheng¹, Yuhani Yusof¹ and Norliza Katuk¹

¹Universiti Utara Malaysia {ong_xun_sheng@soc.uum.edu.my, yuhani@uum.edu.my, k.norliza@uum.edu.my}

Abstract

Finding the shortest yet most efficient route to travel through a given list of specific destinations is a well-known challenge known as Travelling Salesman Problem (TSP). E-hailing or ride-hailing services are services that enable users to gain short-term access to transportation modes on an as-needed basis through online-enabled platforms such as Grab, Uber, etc. This study aims at providing a route planning mobile application for drivers to determine an optimal means of traveling between two or more given locations. In “Share your Ride” mobile application, the route search is optimized based on the shortest distance traveled. Usability of the proposed route planner mobile application is presented to provide insights on the possibility of using it in daily routine. This will help in managing knowledge particularly in transportation and logistic management.

Keywords: *e-hailing, transportation management, mobile application, route planner*

**DEFINING CORE KNOWLEDGE ELEMENTS OF ADAPTIVE AUGMENTED REALITY (A2R)
THROUGH CONCEPTUAL MODEL ANALYSIS**

Norshuhada Shiratuddin¹, Tenh Hock Kuan²

*¹School of Multimedia Technology & Communication, Universiti Utara Malaysia
{shuhada@uum.edu.my}*

²Fakulti Teknologi Kreatif Dan Warisan, Universiti Malaysia Kelantan

Abstract

In this paper, a number of past studies on Adaptive Augmented Reality are scrutinized in order to define the core knowledge elements of adaptive concept. Through model analysis, where four past models were considered; components of such concept were gathered and proposed as a formal definition. Such components were included in a heritage tourism app running on mobile devices. Findings indicated that such core elements are indeed accepted as necessary in defining adaptive augmented reality concept. A Usability test was administered to all the respondents in order to record the app perceived effectiveness, efficiency, learnability, satisfaction and error. The overall score gets a high mean, where all five attributes gathered positive responses from users.

Keywords: Knowledge element, Augmented Reality, Adaptive, Conceptual Model

E-WASTE RECYCLING AWARENESS IN YOUNG ADULTS IN MALAYSIA: AN INTERACTIVE COURSEWARE

Musyrifah Mahmud¹, Lee Angie², Emy Ezura A Jalil³ and Nor Farzana Abd Ghani⁴

^{1, 2, 4}School of Computing, Universiti Utara Malaysia, Malaysia, {musyrifah@uum.edu.my, leeangie9766@gmail.com, farzana@uum.edu.my}

³School of Technology Management & Logistics, Universiti Utara Malaysia, Malaysia, {ezura@uum.edu.my}

Abstract

E-waste is becoming one of the fastest-growing waste globally with an estimation of 1.11 million metric tonnes in 2020 due to the rapid growth of electronic and electrical waste. Improper recycling of e-waste will expose the hazardous compounds contained in e-waste such as lead, mercury which harmful to human health resulting in serious illness. However, e-waste is crucial not only because of the hazardous effect of the chemical waste but also the potential for wealth creation from the proper extraction of precious materials such as silver, gold. This paper describes the requirement design and strategies for an interactive courseware to educate the youth on e-waste information and the proper way to discard them. This courseware development is guided by the Rapid Application Development (RAD) methodology. A post-study survey is conducted to get the user's feedback on E-waste interactive courseware.

Keywords: *household e-waste, electronic waste recycling, awareness, courseware*

**FIGHT AGAINST PHISHING ATTACKS AMONG INTERNET BANKING USER: A KNOWLEDGE
MANAGEMENT TECHNIQUE**

¹Fadare Olusolade Aribake and Zahurin Mat Aji²

Universiti Utara Malaysia, MALAYSIA {¹fadareolusolade@yahoo.com

²Zahurin@uum.edu.my}

Abstract

Global growth in the usage of internet has led to the expansion of Internet Banking. Acceptance of IB among banking users has improved due to the suitability offered. However, a few associated Internet networking risks have increased the possibility of encountering phishing attacks. Phishing attack refers to the most defiant security threats that are often perpetuated by conning user's information, whereby personal information is inadvertently disclosed, sensitive information is deleted, and other related resources are destroyed. To handle the challenge of phishing attacks, knowledge management can be used as a strategy in improving existing products and services, especially in producing essential innovations that may secure the role of banks. Such technological innovations lead to the strengthening of Knowledge Management (KM) in improving performance with the linking of individuals, procedures, and knowledge. To become more efficacious in the era of the knowledge age, organizations need to understand and implement various strategic management techniques. Hence, the paper tries to clarify the role of KM in strengthening its usage in the area of internet banking in fighting against phishing attacks. Once users become more familiar with technology, they tend to have higher anticipations towards technology.

Keywords: *Internet Banking, Phishing Attacks, Knowledge Management*

**AUTOMATED FEEDBACK GENERATION FOR AUTOMATIC PROGRAMMING ASSESSMENT: ITS
CONCEPTUAL AND INITIAL ANALYSIS OF MAPPING STUDIES**

¹Ahmed Abdulsalam Abdulmajeed Al-Athwari, ²Rohaida Romli

School of Computing, College of Arts and Sciences, Universiti Utara Malaysia, Malaysia,

{¹ah.alathwari20112@hotmail.com, ²aida@uum.edu.my}

Abstract

A systematic way of handling programming assignments' assessment via an automated approach is highly demanding. Thus, a method that is called Automated Programming Assessment (or APA) has been widely utilized to support automated marking and grading on students' programming exercises or assignments. Generating useful and meaningful feedbacks automatically via APA is essentially reducing lecturers' efforts, and students could learn to identify their own programming mistakes so as towards the end of learning process they can themselves achieve certain extend of good quality in programming. In this paper, we reveal an initial analysis of a mapping study related to these two contexts of areas so as to identify the criteria and matrices used to support automated feedback generation for more comprehensive features of APA. A technique known as Systematic Mapping Study (SMS) was utilized to comprehensively review the focused studies considering both the fully and semi-automated APA.

Keywords: Automatic Programming Assessment, summative feedback, formative feedback, Systematic Mapping Study, software testing

AUTOMATED GARMENT MEASUREMENT PROTOTYPE: A CONTACTLESS MEANS

Nor Iadah Yusop¹ and Shubashini A/P Thinagaran

Universiti Utara Malaysia, MALAYSIA {noriadah@uum.edu.my}

Abstract

In garment industry, preparing garment patterns accurately is one of the most important factors in the production of fit garments. Body measurement is the first process that must be encountered before any custom-made garment can be designed. The current practice of obtaining the measurement is by traditional methods using tools like measuring tapes. However, this method is considered to be time-consuming and at times could be inaccurate. Moreover, during this pandemic situation, the conventional way of measuring shall be avoided. Hence, an Automated Garment Measurement Application (AGMA) is proposed. The main objective of this paper is to present the viability of obtaining body measurements via AGMA as the contactless means. The application, which is still prototype, applies the TensorFlow's PoseNet technique, allows customers' body measurement be made from a user's uploaded image, thus leaving the needs to be physically present. The evaluation results show that the respondents perceive that it is viability as it could help them get the body measurements more accurate in almost no time.

Keywords: *Tailoring application, Automated measurement, Garment measurement*

THE DESIGN AND USER ACCEPTANCE OF IOT-BASED ACCESS AND ENTRANCE CONTROL SYSTEM USING VOICE RECOGNITION

Ling Zhong Li¹, Mohd Samsu Sajat¹, Yuhanis Yusof¹, Yousef Fazea¹ and Harja Santana Purba²

¹Universiti Utara Malaysia, Malaysia {ling_zhong_li@soc.uum.edu.my, mohdsamsu@uum.edu.my, yuhanis@uum.edu.my, yosiffz@uum.edu.my}

²Universitas Lambung Mangkurat, Indonesia, {harja.sp@ulm.ac.id}

Abstract

Despite the usability of the conventional security measure to identify user's identity and gain access approach, biometric security devices-based Internet-of-Things (IoT) are to be trusted more due to its significant and enhanced security features. This paper aims in designing an IoT-based smart voice activation access control system. The proposed Voice-Activation Entrance System (VAES) is developed based on information gathered through a field-testing approach. The system has been evaluated through usability field testing methodology. Eventually, this can be considered as a reference model for developers and researchers in the area to develop similar apps-based IoT.

Keywords: Voice recognition, Internet of Things, biometric, security system

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