UNIVERSITI KEBANGSAAN MALAYSIA
The National University of Malaysia

FAKULTI TEKNOLOGI DAN SAINS MAKLUMAT
Faculty of Information Science and Technology

Center for Software Technology and Management
SOFTAM
Faculty of Information Science and Technology

RESEARCH BOOKLET

CENTER FOR SOFTWARE TECHNOLOGY AND MANAGEMENT

www.ftsm.ukm.my/softam

computing.ftsmukm

ABOUT **SOFTAM**

The Center for Software Technology and Management (SOFTAM) (established in 22/12/2010) is positioned to be in the research stream of the rapidly changing computing technology. Consisting of more than 30 researchers concentrating in various areas of computing research, SOFTAM looked into the whole spectrum of research, beginning with ideas experimentation, creating the technology, deployment and studying the impact of the results in the real world.

Whether they are technical users, business users, young users or users with other special needs, at SOFTAM users and users' experience are central to its research.

SOFTAM is driven by eight research labs as follows:

1. Agent Mediated E-Commerce and Service Science
2. Business Intelligence
3. Information Systems
4. Distributed and Platform Technology
5. Learning Technology and HCI
6. Games
7. Programming Education and Methodology
8. Strategic Planning and Management

SOFTAM has more than 100 postgraduate students, and most of the research activities are funded by Malaysian Ministry of Higher Education, Ministry of Science, Technology and Innovation as well as the Research University Grant Scheme.

We believe that ideas should be welcomed, experimented and shared.

We strive hard to fulfill the following objectives :

- To provide facilities and infrastructure to carry out research in software technology and management.
- To carry out research for the enrichment of knowledge in software technology and management.
- To develop experts in the field of software technology and management through teaching and research.
- To manage the process of knowledge transfer through training and consultation.
- To develop various types of software technology that can aid in software development activity.
- To generate intellectual property in the area of software technology and management that has value for commercialization.
- To be a center of reference, training as well as technology transfer in the area of software technology and management in Malaysia.

INFORMATION SYSTEMS
R E S E A R C H   L A B

LABORATORY OUTLINE

Information Systems (IS) Lab is part of Strategic Information Systems (SIS) research group. SIS focuses on the management, business and organizational issues associated with the introduction and utilization of information systems as a strategic tool, and considers these issues in a global context.

IS Lab carries out research related to Information Systems management, development of Socio-technical issues in supporting business processes and solve business problems in various domains including healthcare, education and the public service.

RESEARCH FOCUS

- Information Systems/ Health Informatics
- Evaluation, Adoption and Diffusion, Development Management
  - Business/IT alignment/FIT
  - Project Management
  - Business Process Management
  - IT governance

Collaborative Research

INSTITUT JANTUNG NEGARA
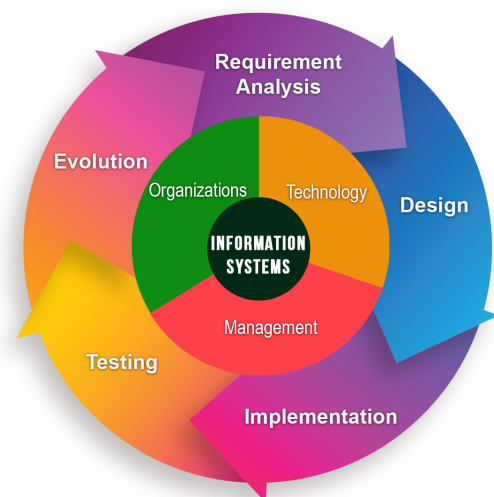National Heart Institute

RESEARCH PROJECTS

- Modelling Information Systems (IS) Security Management for Internet of Things (IoT)- enabled Smart Cities based on Governance, Integrity, and Interoperability, *FRGS/1/2019/ICT04/UKM/03/2*

- A Lean-Fit Approach to Evaluate CDSS Alert Appropriateness in Patient Safety. *FRGS/1/2018/ICT04/UKM/02/5*

- Enhancing the Value of Health Information Systems Evaluation: a Multi-Disciplinary Approach, *DIP-2016-033*

- Factors Influencing the Implementation of Enterprise Architecture in Public Sector. *GGPM-2018-012*

RESEARCHERS

- Assoc. Prof. Dr. Maryati Mohd Yusof **(Head)**
- Dr. Dian Indrayani Jambari
- Ts. Dr. Hasimi Sallehuddin
- Ms. Zaihosnita Hood

SELECTED PUBLICATIONS

- Olufisayo Olusegun Olakotan, Maryati Mohd. Yusof, 2020. Evaluating the alert appropriateness of clinical decision support systems in supporting clinical workflow. *Journal of Biomedical Informatics*

- Maryati Mohd. Yusof. (2019). Improving usability, safety and patient outcomes with health information technology. In *A socio- technical and lean approach towards a framework for health information systems-induced error. IOS Press. No. ISBN/ISSN 9781614999515*

- Hasimi Sallehudin, Ahmad Firdause Md Fadzil, Rogis Baker, 2019. A conceptual study of user adoption for military lifetime health record systems. *International Journal on Informatics Visualization*

- Abdul Aziz, MR, Yusof, MM. 2018. Managing Change: A Model for Organizational Readiness for Pharmacy Information Systems Adoption. *Management Journal*

- Sazrina Ramli, Dian Indrayani Jambari. Capacity planning for green data center sustainability. 2018. *International Journal on Advanced Science, Engineering and Information Technology*

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DISTRIBUTED AND PLATFORM TECHNOLOGY
RESEARCH LAB

DPT
Distributed & Platform Technology

LABORATORY OUTLINE

The emergence of grid and cloud computing has made distributed computing technology a hot research topic. It is well known that cloud has become a disruptive innovation which has transformed the way software is viewed. At DPTL we explore research opportunities ranging from parallel algorithms, cloud services for High Performance Computing (HPC), mobile-cloud applications, trusted computing and security issues in cloud. We are keen to explore research opportunities in Engineering problems, Bioinformatics and Big Data Analytics. Members of DPTL also aim to develop distributed solution frameworks and models for various research areas and SMEs. One of our main goal is to utilize as many open source tools and libraries as possible.
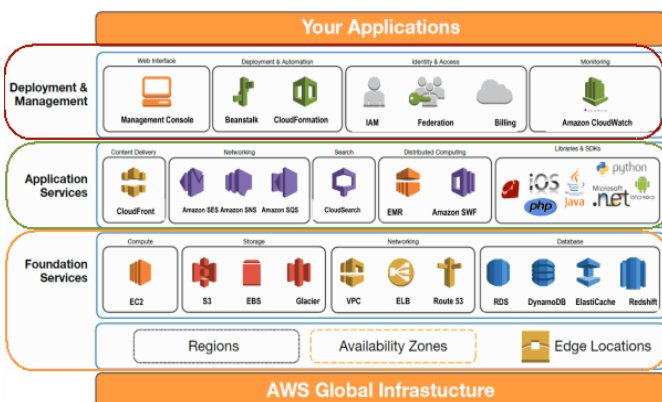
RESEARCH FOCUS

- High performance computing
- Parallel and Distributed Computing
- Parallel Algorithms
- Mobile-cloud applications
- Cloud services for Big Data Analytics
- Open source tools for distributed computing
- Performance model for parallel computation on WAN
- Trusted computing
- Security on cloud

RESEARCH PROJECTS

- Clustering of Evolving Data Streams in the Environment and Climate Change. *FRGS/1/2018/ICT04/UKM/02/1*
- Machine Learning Data Analytics for Adult Obesity Intervention, *DIP-2018-041*
- Adaptive Congestion Control Scheme for High Performance TCP in Multi-Hop Wireless Networks, *DIP-2014-037*
- A Novel Plant Root-Based Evolutionary Algorithm to Solve Mobile Cloud Computing Workflow Scheduling Problem, *FRGS/1/2014/ICT07/UKM/02/1*

SELECTED PUBLICATIONS

- Amirhossein Aghamohammadi, Mei Choo Ang, Elankovan A. Sundararajan, Ng Kok Weng, Marzieh Mogharrebi, Seyed Yashar Banihashem. 2019. A parallel spatiotemporal saliency and discriminative online learning method for visual target tracking in aerial videos. *PLoS ONE*

- Mahmoud Alawi, Elankovan Sundararajan, Abdullah Mohd. Zin, Raed Alsaqour, Mahamod Ismail. 2019. Opportunistic Offloading Scheme In Heterogeneous Vehicular Network. *International Journal of Innovative Technology and Exploring Engineering. 1348-1351.*

- Rami Ahmad, Elankovan A Sundararajan, Nor E. Othman and Mahamod Ismail, 2018. Efficient handover in LTE-A by using mobility pattern history and user trajectory prediction. *Arabian Journal for Science and Engineering*

- Rami Ahmad, Elankovan A. Sundararajan, Nor E. Othman, and Mahamod Ismail. 2018. An efficient handover decision in heterogeneous LTE-A networks under the assistance of users profile. *Telecommunication Systems*

RESEARCHERS

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AGENT MEDIATED E-COMMERCE AND SERVICE SCIENCE
R E S E A R C H   L A B

e-Service
Agent Mediated E-Commerce
& Service Science Lab

LABORATORY OUTLINE

With the advancement in technologies, it is realized that the capacities and scope of services have expanded beyond their traditional realms. Thus, the Agent Mediated E-Commerce and Service Science Research Lab focuses on taking an interdisciplinary approach to study, design, implement and innovate service systems based on concepts of value co-creation and service dominant logic.

Using agent-based technology, focusing on an e-commerce system, the research conducted in this lab aims to develop agent-based framework, system architecture, economic model, business model, negotiation protocols, and security protocols. It also addresses legal and syariah compliancy issues in an e-commerce system. Besides e-commerce, this lab also delves into e-learning, e-government and e-supply chains. In these areas, the research is focused on investigating the evolution, design and evaluation of innovative service systems.

RESEARCH FOCUS

- Syariah Compliant Online Auction Models and Architectures
- Value Co-Creation for Service Systems Design and Evaluation
- E-Service Quality
- Tools and Methods for E-Service Evaluation
- Design and Implementation of Ubiquitous Services
- T-Shaped Entrepreneur Models
- Service Supply Chains
- Tools and Methods for Service Visualization
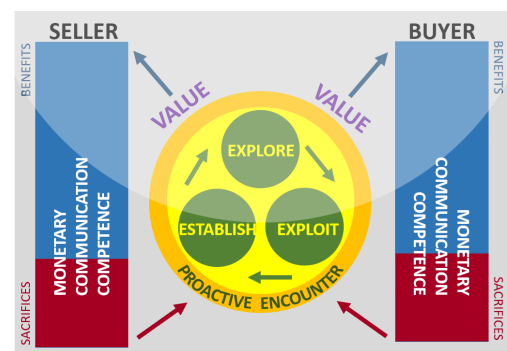
RESEARCH PROJECTS

- Enhancing Learning Process for Al-Quran Equipped with Tajwid using A Self-Learning Tool Embedded on A Special Device, *DCP-2018-001/2*
- Modelling the Customer Behavior by Embedding Value Co-Creation for Sustainability of E-Services, *GGP-2017-021*
- Disruption Model in Livestock Industrial Supply chain, *GUP-2017-099*
- IOT Implementation for Automatic Irrigation and Pesticide Scheduling in Chili Fertigation, *GUP-2017-068*
- Citra E-Auction System based on Shariah, *KRA-2018-024*

RESEARCHERS

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- Dr. Dahlila Putri Dahnil Sikumbang
- Dr. Hazura Mohamed
- Dr. Ruzzakiah Jenal
- Ms. Hazilah Mohd Amin
- Ms. Norleyza Jailani
- Ms. Siti Aishah Hanawi

SELECTED PUBLICATIONS

- Kinn Abass Bakon, **Nur Fazidah Elias**, Ghassan A. O. Abusamhadana, 2020. Culture and digital divide influence on e-government success of developing countries: a literature review. *Journal of Theoretical and Applied Information Technology*

- Walid Abdulla Ali, **Muriati Mukhtar**, Ibrahim Mohamed, 2020. Validating the factors influencing social commerce adoption in small and medium enterprise in malaysia, *Indonesian Journal of Electrical Engineering and Computer Science*

- **Norleyza Jailani**, Mohammed Al-Aaidroos, Muriati Mukhtar, Marini Abu Bakar, Amirah Ismail, 2020. Mapping e-auction sharia compliant requirements to user interface design, *International Journal on Advanced Science, Engineering and Information Technology*

- Nur Athirah Nabila Mohd Idros, **Hazura Mohamed, Ruzzakiah Jenal,** 2020. The use of expert review in component development for customer satisfaction towards e-hailing, *Indonesian Journal of Electrical Engineering and Computer Science*

- Abukar Mohamed, Ruzzakiah Jenal, Siti Aishah Hanawi. 2018. The impact of e-commerce adoption for small and medium enterprise in developing country: a case study Uganda. *Journal of Theoretical and Applied Information Technology*

EEE ENCOUNTER MODEL | MABLUBRICA 2010

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BUSINESS INTELLIGENCE
R E S E A R C H   L A B

LABORATORY OUTLINE

Business Intelligence (BI) Research Laboratory focuses on both theoretical and empirical perspectives that look into the management, business and technology factors. The aim of the research is to provide the decision makers with valuable information and knowledge through variety of sources of data (internal and external), and with structured and unstructured information. With the identified aim the research activities are divided into two main areas: using BI as a process in making business decision and improving business activities, and using BI as an investigative tool.

The study on business process modeling is to emphasis that the business activities should follow the real business flow, thus meet the business objectives of the organization. The research also focuses on analyzing various types of data where each of these data comes with its own concepts and semantics, data formats and access format (includes data warehouse and Big Data).

These analyzes are important during integration of data from diverse sources and producing quality and comprehensive data. The end product will be evaluated and assessed to ensure the quality standard is achieved throughout the organizations.
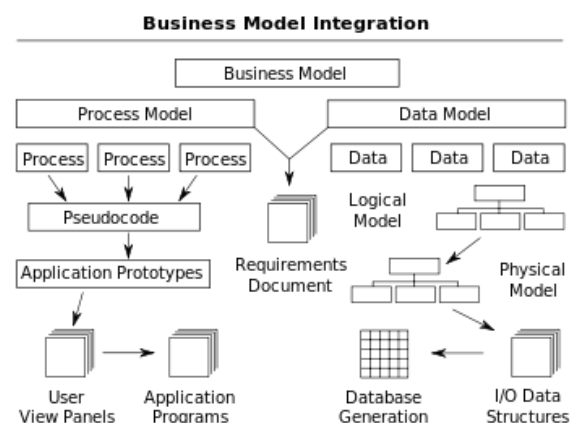
RESEARCH FOCUS

- Database Technology
- Schema and Data Integration
- Business Intelligence framework
- Big Data
- Data Warehouse
- Business Modeling
- Software Quality Assessment
- Software Architecture and Modeling
- Accounting Information Systems
- Information Systems Auditing
- Software Certification Model
- Environmental Monitoring System

RESEARCH PROJECTS

- Lean-Green Software Process Model Based on Sustainability Dimensions and Lean Approach, *FRGS/1/2019/ICT01/UKM/02/1*

- Resilience and Regenerative Tropical Smart Building : Smart & Responsive Facade, *AP-2017-006/4*

- Using Green Data Modelling of Quarry Environment for STEM Education to Enhance Open Data Readiness, Program : Fusion Technologies for Stem Education in Schools to Enhance Open Data Readiness in an Innovative Digital Economy, *AP-2017-005/3*

- Integrated Business Intelligence and Big Data Analytics Framework for Organizational Performance Management in Public Sector, *FRGS/1/2015/ICT04/UKM/02/1*

- MySTA: A Cloud-Based Business Process HUB, *ETP-2013-060*

RESEARCHERS

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- Prof. Dr. Mohd Juzaiddin Ab Aziz
- Assoc. Prof. Dr. Jamaiah Yahaya
- Ts. Dr. Ibrahim Mohamed

SELECTED PUBLICATIONS

- Said Al Tahat, Kamsuriah Ahmad. 2019. Lexical disambiguation (CKBD): A tool to identify and resolve semantic conflicts using context knowledge. *International Journal on Advanced Science, Engineering and Information Technology.*

- Nur Hani Zulkifli Abai, Jamaiah Yahaya, Aziz Deraman, Abdul Razak Hamdan, Zulkefli Mansor, Yusmadi Yah Jusoh, 2019. Integrating business intelligence and analytics in managing public sector performance: an empirical study. *International Journal on Advanced Science, Engineering and Information Technology.*

- Mohammed Aboaoga, Mohd Juzaiddin Ab Aziz, Ibrahim Mohamed, 2018. Information system success framework based on interpersonal conflict factors. *International Journal of Electrical and Computer Engineering.* 2088-8708.

- Ebrahim Gahleb, Ibrahim Mohamed, 2018. Impact of user requirements on health information systems (HIS) and adoption of his in developing countries. *Journal of Software Engineering & Intelligent Systems.*

Business Model Integration

LEARNING TECHNOLOGY AND HCI
R E S E A R C H   L A B

LABORATORY OUTLINE

The laboratory is contributing to the development of new knowledge and technologies in correlation with the users. The approach is interdisciplinary an it draws upon learning theory and human computer interaction (HCI) design.

Research in this lab is based on the concept of user-driven innovation in order to bring user mental model and behaviour into design. Learning design principles, cognitive science, educational psychology and HCI are applied to develop an effective learning technology.

RESEARCH FOCUS

RESEARCH PROJECTS

- Engagement Model of Computerized Cognitive Behavioral Therapy for Depression to Lower Adolescent Patient Attrition Rates, *FRGS/1/2019/ICT04/UKM/02/1*
- 'Dr Lada' Hybrid Application Development , *TT-2019-004*
- Credibility Measurement Indicator of Islamic Information in Social Media, *DCP-2017-013/1*
- Smart Management of Digital Footprint in New Media, *DCP-2017-013/5*
- Programming Problem Solving Model using The Concept of Computational Thinking, *GUP-2018-155*
- Digital Games for Disaster Awareness. *KRA-2018-025*
- Vamuse-C (Virtual Museum Commerce), *INOVASI-2017-005*

SELECTED PUBLICATIONS

- Punia Turiman, Tengku Siti Meriam Tengku Wook, and Kamisah Osman, 2019. 21st century skills mastery amongst science foundation programme students. *International Journal on Advanced Science, Engineering and Information Technology*
- Firas Layth Khaleel, Noraidah Sahari Ashaari, Tengku Siti Meriam Tengku Wook, 2019. An empirical study on gamification for learning programming language website. *Jurnal Teknologi.*
- Nursyahida Mokhtar, Amirah Ismail, Zurina Muda, 2019. Designing model of serious game for flood safety training. *International Journal of Advanced Computer Science and Applications.*
- Nur Atiqah Zaini, Siti Fadzilah Mat Noor, Tengku Siti Meriam Tengku Wook. 2019. Evaluation of APi interface design by applying cognitive walkthrough. *International Journal of Advanced Computer Science and Applications.*
- Hairulliza Mohamad Judi, Siti Fadzilah Mat Noor, Noor Syafawati Rahim, 2019. Visualisation method for effective presentation of hadith commentary using cone tree. *Journal of Engineering and Applied Sciences*
- Saffa Raihan Zainal Abidin, Siti Fadzilah Mat Noor, Noraidah Sahari @Ashaari, 2019. Low-fidelity prototype design for serious game for slow-reading students. *International Journal of Advanced Computer Science and Applications.*

RESEARCHERS

- Assoc. Prof. Dr. Tengku Siti Meriam Tengku Wook **(Head)**
- Assoc. Prof. Dr. Noraidah Sahari @ Ashaari
- Assoc. Prof. Dr. Nurhizam Safie Mohd Satar
- Dr. Amirah Ismail
- Dr. Siti Fadzilah Mat Noor
- Ms. Hairulliza Mohammad Judi

GAMES
R E S E A R C H   L A B

LABORATORY OUTLINE

We carry out research on game science, digital media processing and multimedia applications/systems which covers theories and approaches; 2D/3D modeling; framework and models; design and development; and evaluation.

RESEARCH FOCUS

- Game Science and Design
- Digital Media Processing
- Multimedia Systems and Usability Evaluation
- Serious Games, Accessibility and Affective Computing, Digital Heritage
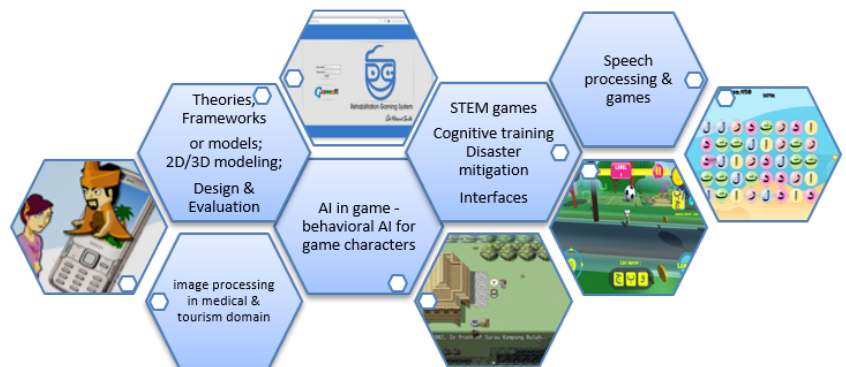
RESEARCH PROJECTS

- Requirements Modelling and Validation for Designing Effective Climate Change Game (CCG), *FRGS/1/2019/ICT01/UKM/01/1*
- Natural User Interface (NUI) Serious Game Model for Post-Stroke Rehabilitation, *FRGS/1/2019/ICT01/UKM/02/3*
- Interactive Role-Playing Model in 3D Simulation Games as a Tool for Increasing Mental Health Awareness in Society, *GUP-2019-05*
- Modified Light Scattering Model Parameter Effects on Facial Aging Perception of Synthesize Images, *GGPM-2019-038*
- Speech Detection for Early Diagnosis of Vocal Cords Disease using Fuzzy Approach, *GGPM-2017-020*
- Game-Engine Driven 3D Interactive MOOC for Teaching Hands-on Laboratory Skills in STEM, *GGP-2017-076*
- Cultural Heritage Game and Simulation as a Tool for Developing Cultural Indentity, *DCP-2017-007/1*
- Development of Tembaga Craft Intangible Heritage Knowledge Base and Game, *DCP-2017-007/2*
- Jawi Writing Game Application Developement, *INOVASI-2017-018*

SELECTED PUBLICATIONS

- Ahmed Mohammed Elaklouk, Nor Azan Mat Zin. 2019. A rehabilitation gaming system for cognitive deficiencies: design and usability evaluation. *International Journal on Advanced Science, Engineering and Information Technology*
- Nursyahida Mokhtar, Amirah Ismail, Zurina Muda. 2019. Designing model of serious game for flood safety training. *International Journal of Advanced Computer Science and Applications*
- Fadhilah Rosdi, Siti Salwah Salim, Mumtaz Mustafa Begum. 2019. An FPN-based classification method for speech intelligibility detection of children with speech impairments. *Soft Computing.*
- Wan Malini Wan Isa, Nor Azan Mat Zin, Fadhilah Rosdi, Hafiz Mohd Sarim, 2019. Digital preservation of cultural heritage: Terengganu brassware craft knowledge base. *International Journal of Advanced Computer Science and Applications*
- Mohanad Muayad John Jurjee, Hafiz Mohd Sarim, Noora Hani Abdulmajeed Al-Dabbagh, Erna Budhiarti Nababan, 2017. A Multi-Population Harmony Search Algorithm for The Dynamic Travelling Salesman Problem with Traffic Factors. *Journal of Theoretical and Applied Information Technology*
- Azrulhizam Shapi'i, Noor Atifah Abd Rahman, Mohd Syazwan Baharuddin, Mohd Ridzwan Yaakub, 2018. Interactive games using hand-eye coordination method for autistic children therapy. *International Journal on Advanced Science, Engineering and Information Technology*

RESEARCHERS

- Prof. Dr. Nor Azan Mat Zin **(Head)**
- Dr. Zurina Muda
- Dr. Fadhilah Rosdi
- Dr. Hadi Affendy Dahlan
- Dr. Azrulhizam Shapi'i
- Dr. Hafiz Mohd Sarim

STRATEGIC PLANNING AND MANAGEMENT
R E S E A R C H   L A B
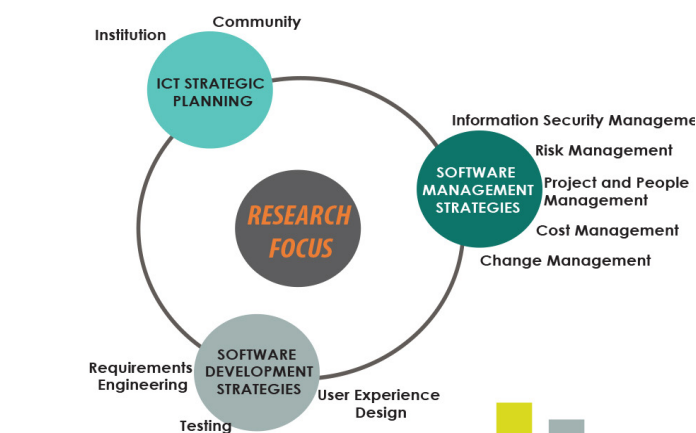
STRATEGIC Planning AND MANAGEMENT

LABORATORY OUTLINE

The Strategic Planning and Management (SPM) Laboratory supports research activities concerning software systems as a strategic tool to achieve organisastional vision, mission and goals. It aims to produce high quality research products that emphasis on strategic management theories for addressing practical information and communications technology (ICT) concerns.

Its products involve the formulation of ICT strategies for planning, developing and managing large scale software systems from both theoretical and empirical perspectives. Its primary objective is to conduct research consistently with institutional and public interests.

RESEARCH FOCUS

INSPIRE TO LEAD, STRATEGISE FOR THE FUTURE

RESEARCH PROJECTS

- Integrated Electronic Health Services Standard for ASEAN Countries, *GUP-2018-005*
- A knowledge sharing framework for Agile Virtual Teams, *FRGS/1/2018/ICT04/UKM/02/11*
- Cultural-Centered Interface Design Model to Increase Student Engagement and Commitment for E-Learning in Malaysia, *FRGS/1/2016/ICT01/UKM/02/2*
- Project Manager Profiling in Managing the cost for Agile Software Development Project, *GGPM-2015-002*
- The Development of Agile Project Manager Competency Measurement Tool, *PRGS/2/2015/ICT01/UKM/02/2*

SELECTED PUBLICATIONS

- Fatin Filzahti Ismail, Rozilawati Razali, Zulkefli Mansor, 2019. Considerations for cost estimation of software testing outsourcing projects. *International Journal on Advanced Science, Engineering and Information Technology.*
- Marfizah A.Rahman, Rozilawati Razali, Fatin Filzahti Ismail, 2019. Risk factors for software requirements change implementation. *International Journal of Advanced Computer Science and Applications*
- Adiel Harun, Zulkefli Mansor, 2019. Individual readiness for change in the pre-implementation phase of campus Enterprise Resource Planning (ERP) Project in Malaysian public university. *International Journal of Advanced Computer Science and Applications*
- Yuslina Yusoff, Zuraini Alias, Mokhtar Abdullah, Zulkefli Mansor, 2019. Agile marketing conceptual framework for private higher education institutions. *International Journal of Academic Research in Business and Social Sciences*
- Zainul Akramin Mohd Drus, Dalbir Singh, Mohd Rosmadi Mokhtar, Rusdi Abd Rashid, 2018. Review of computerized cognitive behavioural therapy based on culture centered design for substance abuse in Malaysia. *Asia-Pacific Journal of Information Technology and Multimedia*

RESEARCHERS

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Faculty of Information Science and Technology

PROGRAMMING EDUCATION AND APPROACHES
RESEARCH LAB

LABORATORY OUTLINE

Programming Education & Approaches Research Lab (PEARL) aims to promote research within the field of Programming Education and Computer Science in general. Our goal is to understand how we can improve the teaching and learning of computer programming, and how contemporary issues in higher education, such as the use of new technologies can impact upon the teaching and learning environment.

Thus current challenge for programming education is to introduce programming to all students from the very early age. The second challenge within the 4IR environment is programming over multiple connected autonomous devices which requires communication and interaction in Cyber Physical System (CPS) that involves embedded systems such as robots and UAVs, Internet of Things, sensors, RFID and mobile devices.

RESEARCH FOCUS

Programming Education Methodology and Approaches:
- Visual approach to programming
- Learning programming through game development
- Programming of physical objects

Programming Education Tools and Services :
- Innovative tools for teaching of programming
- Competitive environment for learning of programming
- Programming competency assessment tool
- Automatic programming marking tool   Advanced

Programming Technologies:
- Advance ubiquitous computing
- Block-based programming approach
- Service-oriented development methodology

RESEARCH PROJECTS

- Programming Problem Solving Model using The Concept of Computational Thingking through Scaffolding Techniques, *GUP-2018-155*
- Visualizing the Malay Ethnoscience in Proverbs through Interactive games, *DCP-2017-007/3*
- Routing Protocol for Robust and Trust Dynamic Mobile Gateway Selection in Heterogeneous Vanet-UMTS Network, *FRGS/1/2016/ICT03/UKM/02/2*
- Game Engine Framework as A Teaching Tool for Introductory to Programming Course, *FRGS/1/2016/ICT01/UKM/02/3*

SELECTED PUBLICATIONS

- Ahgilan Peremol, Rodziah Latih, Marini Abu Bakar, 2019. MyJavaSchool: modul pembelajaran pengaturcaraan untuk sekolah menengah, *SOFTAM Postgraduate Seminar 2019*
- Rodziah Latih, Marini Abu Bakar, 2019. M-Java: Gaya Pembelajaran Pengaturcaraan Generasi-Z. *Teknologi Komputeran Generasi-Z. Penerbit UKM. pp. 153 - 166*
- Mohammed Al-aaidroos, Norleyza Jailani, Muriati Mukhtar, 2019. Expert validation on a reference model for e-auctions that conform to Islamic trading principles. *Journal of King Saud University - Computer and Information Sciences.*
- Rodziah Latih, Marini Abu Bakar, Norleyza Jailani, Noorazean Mohd Ali, Syahanim Mohd Salleh, Abdullah Mohd Zin, 2018. Challenge-based programming learning design. *International Journal on Advanced Science, Engineering and Information Technology.*
- Abdullah Mohd Zin, Mustafa Almatary, Marini Abu Bakar, Rodziah Latih, Norleyza Jailani, 2018. Blocks correctness evaluation methodology for block-based software development. *International Journal on Advanced Science, Engineering and Information Technology*
- Syahanim Mohd Salleh, Zarina Shukur, Hairulliza Mohamad Judi, 2018. Scaffolding model for efficient programming learning based on cognitive load theory. *International Journal of Pure and Applied Mathematics*

RESEARCHERS

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RESEARCHERS

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RESEARCH INTERESTS
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RESEARCH INTERESTS
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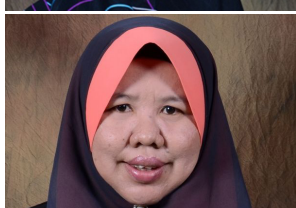✉ fazidah@ukm.edu.my   📞 +603 - 8921 6748

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