

PROCEEDING



2015 International Conference on Science in Information Technology (ICSITech)

Big Data Spectrum for Future Information Economy

Yogyakarta, October 27th - 28th, 2015

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2015 International Conference on Science in Information Technology (ICSITech)

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PROCEEDING

2015 International Conference on Science in
Information Technology (ICSITech)

“Big Data Spectrum for Future Information Economy”

27 - 28 October 2015
Yogyakarta, Indonesia

Foreword from Conference Chair

Welcome you to The 2015 International Conference on Science in Information Technology (ICSITech) on “Big Data Spectrum for Future Information Technology” organized by Universitas Ahmad Dahlan as a host, Universitas Pendidikan Indonesia, Universitas Mulawarman, UPN “Veteran” Yogyakarta, and UTM Big Data Centre-Universiti Teknologi Malaysia. It is both an honor and a privilege to stand before you today and welcome you to this learned community.

As we know, Big data is a popular term used to describe the exponential growth and availability of data, both structured and unstructured. And big data may be as important to business – and society – as the Internet has become. Why? More data may lead to more accurate analyses. To raise awareness of the Big Data and its challenges, Informatics Department of Universitas Ahmad Dahlan holds this conference to offer you a unique opportunity to share ideas and experiences and to discuss evolving Big Data and its challenges, which we definitely hope to result in the improved research and practice of Big Data in Universitas Ahmad Dahlan.

This conference is the first ICSITech Conference and next year it will be hosted by Universitas Mulawarman, Samarinda Indonesia. This conference is IEEE conference so that papers accepted and presented will be forwarding for consideration to be published in the IEEE Xplore Digital Library.

From more than hundreds paper that came to us, with the long and tight review process, we only accepted 66 paper that will be presented today in parallel session, so that, it is free to all of you to choose which room to be attended according to your interest. I thank to Ministry of Research, Technology, and Higher Education (RISTEKDIKTI), Republic of Indonesia for funding this conference, IEEE Indonesia Section as technical co-sponsor for this conference. I also thank to our partner, Universitas Pendidikan Indonesia, Universitas Mulawarman, UPN “Veteran” Yogyakarta, and UTM Big Data Centre-Universiti Teknologi Malaysia.

With this conference, we are expanding the value of the partnership today with our colleagues outside the continent. We certainly will benefit from the 3 expert fellow friends from University Teknologi Malaysia (Malaysia), National Taiwan University of Science and Technology (Taiwan), and AGH University of Science and Technology (Poland). I hope this expanded partnership can be further deliberated during the conference. I believe that the session ahead provide us the opportunity to discuss on the fields of Big Data: Challenges and Practical Applications, Data Science vs. Big Data @ UTM Big Data Centre, and Comparison of Data Mining Techniques for Money Laundering Detection System. With that note, again, a very warm welcome to all of you and I hope that the Conference will be fruitful and your next few hours here will be productive and also enjoyable.

ICSITech 2015 Chairman
Rusydi Umar, Ph.D

Welcome Message from the Rector of UAD

First of all, let us thank Allah, the Almighty, for blessing and guiding us into the right path, and for granting all means and opportunities together here to attend this very meaningful occasion.

On behalf of the Universitas Ahmad Dahlan, we are greatly honored and pleased to welcome you all to The 2015 International Conference on Science in Information Technology (ICSITech). I thank to Ministry of Research, Technology, and Higher Education (RISTEKDIKTI), Republic of Indonesia for funding this conference, IEEE Indonesia Section as technical co-sponsor for this conference. I also thank to our partner, Universitas Pendidikan Indonesia, Universitas Mulawarman, UPN “Veteran” Yogyakarta, and UTM Big Data Centre-Universiti Teknologi Malaysia. I also thank to steering committee, all reviewer from across the globe as a scientific committee, and organizing committee. Without all your effort this conference will not be held as it is now.

We would also like to extend our gratitude especially to Prof. Siti Mariyam Shamsuddin, UTM Big Data Centre, Universiti Teknologi Malaysia, Malaysia. Assist. Prof. Rafał Dreżewski (AGH University of Science and Technology, Poland), Prof. Shi-Jinn Horng (National Taiwan University of Science and Technology, Taiwan) who have accepted our invitation to become the invited speakers of today's Conference. Special Guest from IEEE Indonesia Section, Special Guests from Ministry of Research, Technology, and Higher Education (RISTEKDIKTI), Republic of Indonesia which also funding this conference. Distinguished Guests from Universitas Pendidikan Indonesia, Universitas Mulawarman, UPN “Veteran” Yogyakarta, and Universiti Teknologi Malaysia.

Ladies and gentlemen, finally allow me on behalf of the big family of Universitas Ahmad Dahlan to wish you a fruitful and pleasant international conference.

Yogyakarta, October 27, 2015

Dr. Kasiyarno. Rector of UAD

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Opening Message

From IEEE Indonesia Section Chair, to be addressed in the 2015 International Conference on Science in Information Technology (ICSITech 2015).

Dear colleagues, Professors, researchers, ICT professionals, ladies and gentlemen, good morning.

On behalf of IEEE Indonesia section, I would like to express my sincere gratitude and welcome you to the 2015 International Conference on Science in Information Technology (ICSITech 2015). This conference is organized by Universitas Ahmad Dahlan, Universitas Pendidikan Indonesia, Universitas Mulawarman, UPN “Veteran” Yogyakarta, and Universiti Teknologi Malaysia.

ICSITech 2015's conference with the theme “Big Data Spectrum for Future Information Economy”, has been approved by IEEE and Technical co-sponsored with the conference no #35378.

This conference is aimed at keeping abreast of the current development and innovation in the advanced of research area on Science in Information Technology, as well as providing an engaging forum for participants to share knowledge and expertise in related issues.

This conference is really important, because Indonesia is an emerging country, one of the fastest growing countries in South East Asia and Pacific. Based on International Data Corporation, Indonesia has become the largest spender on ICT in South East Asia and is ranked 19th by spending globally. This is related to the Indonesia Economic Masterplan to 2025 (MP3EI) that Indonesia has ambitious plans and strategies to accelerate the economic development through ICT infrastructures.

As a critical hub to the Sub-Districts and Villages in Indonesia, the Palapa Ring Development Project connects 34 provinces and 440 cities/districts, stitching a circumference of 36,000 km fiber optics cable. The National Backbone Network, the Palapa Ring, will be completed with the last implementation in the submarine cable in the most eastern part, Papua Province. The National Network capacity and speed would be much improved with its completion. A network failure or disconnection in the Ring would be compensated by rerouting traffic through the other side and provide greater access to ICT beyond Jakarta and the Island. The capacity is practically unlimited (Tbps), cheaper access and better guarantee of continuity.

The Palapa Ring could easily provide Network Transit for Asia and Pacific Region, between the Indian and Pacific Oceans and the three (3) Continents (Asia-Australia-Americas). It would be easy to access our neighboring ASEAN countries, Singapore, Brunei Darussalam, Malaysia, Philippines, and Thailand.

Based on World Bank, technological progress is a considerable driving force behind economic growth, citizen engagement and job creation.

Information and communication technologies (ICTs), in particular, are reshaping many aspects of the world's economies, governments and societies. In developing countries, public officials, businesses and citizens are working together to harness the transformative power of ICTs to make services more efficient, catalyze economic development and strengthen social networks.

Based on ITU, currently there are more than 7 billion mobile cellular subscriptions worldwide, corresponding to a penetration rate of 97%. In Indonesia currently have about 250 million mobile cellular subscriptions, with penetration rate about 105%.

Mobile broadband penetration worldwide reaches 47% in 2015, a value that increased 12 times since 2007 and in Indonesia reaches 37%, about 88 million people using internet in 2015.

As we may aware, IEEE is one of the largest professional associations in the world. Having been founded over 130 years ago, nowadays it brings together over 432,000 active members in more than 160 countries. This is the world's largest technical professional society, dedicated to fostering technological innovation and excellence for the benefit of humanity. IEEE provides more than 3.5 million digital libraries and currently has organized about 1,300 annual conferences, worldwide.

IEEE Indonesia section, which is a part of IEEE global, has already been established for 28 years. It currently has about 1,425 active members, and has been awarded 2015 Outstanding Section Membership Recruitment Performance from IEEE Headquarter. Among all grades of IEEE membership Indonesia, member grade and student grade are two largest membership grades that shares about 58% and 28% of all active member, respectively.

IEEE Indonesia Section has activities in 6 society chapters, namely Computer Society Chapter, Communications Society Chapter, Circuits and Systems Chapter, Engineering in Medicine and Biology Chapter, Solid State Circuits Society Chapter, and Power and Energy Chapter. Moreover, IEEE Indonesia section also has 4 joint chapters, namely Joint chapter of Microwave Theory / Antennas & Propagation, Joint chapter of Aerospace & Electronics Systems Society / Geoscience & Remote Sensing Society, Joint chapter of Control System Society / Robotics & Automation Society, and Join Chapter of Education Society / Electron Devices Society / Power Electronics Society / Signal Processing Society.

IEEE Indonesia Section has 19 student branches (SB) 4 SB chapters in several universities in Java, Sumatera, Bali and Sulawesi islands and three Affinity Groups, namely Women in Engineering, SIGHT in Telemedicine, and SIGHT in Humanitarian Technology.

IEEE Indonesia section has organized several activities almost weekly. Its activities are related to Technical, Education, and Social Activities, such as ICT Training, Workshop, International Seminar, Focus Group discussion, and Distinguish Lecturer Tour (DLT) activities all around Indonesia. The main discussed topics are related to the technology for humanity, such as Internet of Things (IoT), Big Data, Artificial Intelligent, Robotic technology, Biomedicine Technology, Antenna and Microwave, Circuit and Device, Renewable Energy, etc. Recently, IEEE Indonesia section organized two days 5G training; with the trainer is the one of the worldwide recognized professor in the field of Wireless Communication. We believed that it was the first 5G training activities in the Asia Pacific region. We continuing try to serve the members with more activities that make them more benefit with the organization.

In terms of collaboration, IEEE Indonesia section has a good and mutual relationship with ICT organizations, Industries, Universities as well as the government in Indonesia. IEEE Indonesia also participated in the preparation of forming a new regulation related to the ICT in Indonesia.

I do hope in the near future the event will be continued and strengthened, so the result will give more benefit and positive impact to the Indonesian people. Technology drives innovation, people can do more, do better. Technology drives higher quality of life, people can live better.

In this occasion, I would also like to say welcome to Yogyakarta, one of the famous destinations in Indonesia. Yogyakarta serves beautiful heritages, culture, mountain and scenery with warm and friendly people, a vibrant culture and lifestyle.

Finally, we do hope all of you will have enjoyable and valuable experience. During this 2 days conference, you may share your best knowledge in your area of research and professional activities.

Thank you.

Yogyakarta, 27 October 2015.

IEEE Indonesia Section Chair
Satriyo Dharmanto

Program Schedule

Day 1: Tuesday, October 27th, 2015

07.00 – 08.00 **Registration** – Room: Ballroom (4th Floor)

08.00 – 08.45 **Opening Ceremony** – Room: Ballroom (4th Floor)
Qur'an Recitation

Welcome Messages:

1. ICSITech 2015 Chairman : Rusydi Umar, Ph.D
2. Rector of UAD : Dr. Kasiyarno, M.Hum.
3. IEEE Indonesia Section : Satriyo Dharmanto

08.45 – 09.00 **Coffee Break I** – Room: Ballroom (4th Floor)

09.00 – 10.40 **Keynote Speech Session 1** – Room: Ballroom (4th Floor)

Data Science vs Big Data @ UTM Big Data Centre,

by Prof. Siti Mariyam Shamsuddin

(UTM Big Data Centre, Universiti Teknologi Malaysia, Malaysia)

Comparison of Data Mining Techniques for Money Laundering Detection System,

by Assist Prof. Rafał Dreżewski

(AGH University of Science and Technology, Poland)

10:40 – 12:00 **Parallel Class Session I-A : Informatics Track** – Room : Frangipani (3rd Floor)

10:40 – 11:00 (1570182343) Recognition of Malaysian Sign Language Using Skeleton Data with Neural Network

Sutarman (University Technology of Yogyakarta, Indonesia; Universiti Malaysia Pahang, Malaysia), Mazlina Abdul Majid (Universiti Malaysia Pahang, Malaysia), Jasni Mohamad Zain (Universiti Malaysia Pahang, Malaysia), Arief Hermawan (University Technology of Yogyakarta, Indonesia)

11:00 – 11:20 (1570148107) Active Contour Bilateral Filtering for Breast Lesions Segmentation on Ultrasound Images

Anan Nugroho (Universitas Gadjah Mada, Indonesia), Hanung Adi Nugroho (Universitas Gadjah Mada, Indonesia), Lina Choridah (Sardjito Hospital, Universitas Gadjah Mada, Indonesia)

11:20 – 11:40 (1570148091) Automatic Image Segmentation using Sobel Operator and *k*-Means Clustering: A Case Study in Volume Measurement System for Food Products

Joko Siswanto (Universitas Surabaya, Indonesia; Universiti Kebangsaan Malaysia, Malaysia), Anton Satria Prabuwono (King Abdulaziz University, Saudi Arabia; Universiti Kebangsaan Malaysia, Malaysia), Azizi Abdullah (Universiti

Kebangsaan Malaysia, Malaysia), Bahari Idrus (Universiti Kebangsaan Malaysia, Malaysia)

11:40 – 12:00 (1570164099) Performance Evaluation of Combined Feature Selection and Classification Methods in Diagnosing Parkinson Disease Based on Voice Feature
Made Satria Wibawa (Universitas Gadjah Mada, Indonesia), Hanung Adi Nugroho (Universitas Gadjah Mada, Indonesia), Noor Akhmad Setiawan (Universitas Gadjah Mada, Indonesia)

10:40 – 12:00 **Parallel Class Session I-B : Informatics Track** – Room : Tulip (3rd Floor)

10:40 – 11:00 (1570176819) The Stand Meter Extraction of kWh-meter
Herryawan Pujiharsono (Universitas Gadjah Mada, Indonesia), Hanung Adi Nugroho (Universitas Gadjah Mada, Indonesia), Oyas Wahyunggoro (Universitas Gadjah Mada, Indonesia)

11:00 – 11:20 (1570182617) Perspective Rectification in Vehicle Number Plate Recognition Using 2D-2D Transformation of Planar Homography
Daniel Paulus Sihombing (Universitas Gadjah Mada, Indonesia), Hanung Adi Nugroho (Universitas Gadjah Mada, Indonesia), Sunu Wibirama (Universitas Gadjah Mada, Indonesia)

11:20 – 11:40 (1570163239) An Artificial Neural Network Hybrid with Wavelet Transform for Short-Term Wind Speed Forecasting: A Preliminary Case Study
Moslem Yousefi (Center for Advanced Mechatronics and Robotics, Universiti Tenaga Nasional, Malaysia), Danial Hooshyar (University of Malaya, Malaysia), Milad Yousefi (Universidade Federal de Minas Gerais, Brazil), Weria Khaksar (Center for Advanced Mechatronics and Robotics, Universiti Tenaga Nasional, Malaysia), Khairul Salleh Mohamed Sahari (Center for Advanced Mechatronics and Robotics, Universiti Tenaga Nasional, Malaysia), Firas B. Ismail Al-Naimi (Power Generation Research Centre, Universiti Tenaga Nasional, Malaysia)

11:40 – 12:00 (1570177309) Video Summarization Using a Key Frame Selection Based on Shot Segmentation
Wisnu Widiarto (Sebelas Maret University, Indonesia), Eko Mulyanto Yuniarno (Sepuluh Nopember Institute of Technology, Indonesia), Mochamad Hariadi (Sepuluh Nopember Institute of Technology, Indonesia)

10:40 – 12:00 **Parallel Class Session I-C : Informatics Track** – Room : Dahlia (3rd Floor)

10:40 – 11:00 (1570178451) Case-based System Model for Counseling Students
Syaiful Hendra (STMIK Adhi Guna, Indonesia), Sri Kusumadewi (Universitas Islam Indonesia, Indonesia)

11:00 – 11:20 (1570148105) Model Discovery of Parallel Business Processes using Modified Heuristic Miner
Riyanarto Sarno (Institut Teknologi Sepuluh Nopember, Indonesia), Fitrianing Haryadita (Institut Teknologi Sepuluh Nopember, Indonesia), Dwi Sunaryono (Institut Teknologi Sepuluh Nopember, Indonesia), Abdul Munif (Institut Teknologi Sepuluh Nopember, Indonesia)

- 11:20 – 11:40 (1570206791) Design of Chatbot with 3D Avatar, Voice Interface, and Facial Expression
Antonius Angga P. (Gunadarma University, Indonesia), Edwin Fachri W. (Gunadarma University, Indonesia), Eleanita A. (Gunadarma University, Indonesia), Suryadi (Gunadarma University, Indonesia), Dewi Agushinta R. (Gunadarma University, Indonesia)
- 11:40 – 12:00 (1570210487) Consultation Services Using IVR Telephony Based on Expert System Perspective
Istiadi (Widyagama University of Malang, Indonesia), Emma Budi Sulistiarini (Widyagama University of Malang, Indonesia), Rudy Joegijantoro (Widyagama Husada College of Health, Indonesia)
- 10:40 – 12:00 **Parallel Class Session I-D : Informatics Track** – Room : Carnation (3rd Floor)
- 10:40 – 11:00 (1570182681) Enabling Custom Application Content through Semantic Web Filters
Sailesh Kumar Sathish (Samsung R&D Institute India, India), Anish Anil Patankar (Samsung R&D Institute India, India), Nimesh Priyodit (Samsung R&D Institute India, India), Nirmesh Neema (Samsung R&D Institute India, India)
- 11:00 – 11:20 (1570183033) Proof of Attributes Based CL Signature Scheme on E-Health Applications
Mike Yuliana (Electronic Engineering Polytechnic Institute of Surabaya, Indonesia), Aries Pratiarso (Electronic Engineering Polytechnic Institute of Surabaya, Indonesia), Amang Sudarsono (Electronic Engineering Polytechnic Institute of Surabaya, Indonesia)
- 11:20 – 11:40 (1570183161) Multicriteria Decision Analysis for Optimizing Site Selection of Electronic and Electricity Equipment Waste Dismantling and Sorting Facility (Case Study: in Indonesia, using AHP)
Pertiwi Andarani (Universitas Diponegoro, Indonesia), Wiwik Budiawan (Universitas Diponegoro, Indonesia)
- 11:40 – 12:00 (1570188719) Comparisons of Scalar Multiplication Methods with Proposed Efficient Blind Signature Scheme for E-Voting System
Aye Aye Thu (University of Computer Studies, Yangon, Myanmar), Khin Than Mya (University of Computer Studies, Yangon, Myanmar)
- 10:40 – 12:00 **Parallel Class Session I-E : Information System Track** – Room : Heliconia (3rd Floor)
- 10:40 – 11:00 (1570163677) Personalized E-Learning Architecture In Standard-Based Education
Kusuma Ayu Laksitowening (Telkom University, Indonesia), Zainal A. Hasibuan (University of Indonesia, Indonesia)
- 11:00 – 11:20 (1570183259) Design and Implementation of Web-Based Geographic Information System for Public Services in Bandar Lampung City – Indonesia
Gigih Forda Nama (University of Lampung, Indonesia), Melvi Ulvan (University

of Lampung, Indonesia), Ardian Ulvan (University of Lampung, Indonesia), Abdul Munif Hanafi (University of Lampung, Indonesia)

11:20 – 11:40 (1570161623) E-Gov Adoption Model of the Military Organization in Indonesia
Achmad Farid Wajdi (Bina Nusantara University, Indonesia), Dyah Budiastuti (Bina Nusantara University, Indonesia)

11:40 – 12:00 (1570164279) Research Plan Development Concerning E-Image Impact Towards Online Purchase Intention And Premium Pricing Strategies In Indonesia Community Based Online Market
Robertus Nugroho Perwiro Atmojo (Bina Nusantara University, Indonesia), Restu Mahesa (Prasetiya Mulya Business School, Indonesia), Wanda Wandoko (Bina Nusantara University, Indonesia), Viany Utami Tjhin (Bina Nusantara University, Indonesia), Harjanto Prabowo (Bina Nusantara University, Indonesia), Dyah Budiastuti (Bina Nusantara University, Indonesia), Ford Lumban Gaol (Bina Nusantara University, Indonesia), Theresia Nanin Koeswidi Astuti (The Christian University of Indonesia, Indonesia)

10:40 – 12:00 **Parallel Class Session I-F : Informatics Track** – Room : Lotus (3rd Floor)

10:40 – 11:00 (1570164403) Performance of Modeling Time Series Using Nonlinear Autoregressive with eXogenous input (NARX) in the Network Traffic Forecasting
Haviluddin (Universitas Mulawarman, Indonesia), Rayner Alfred (Universiti Malaysia Sabah, Malaysia)

11:00 – 11:20 (1570200681) Toward New Fruit Color Descriptor based on Color Palette
Ema Rachmawati (Institut Teknologi Bandung, Indonesia), Masayu Leylia Khodra (Institut Teknologi Bandung, Indonesia), Iping Supriana (Institut Teknologi Bandung, Indonesia)

11:20 – 11:40 (1570164387) A Genetic-Based Backpropagation Neural Network for Forecasting in Time-Series Data
Haviluddin (Universitas Mulawarman, Indonesia), Rayner Alfred (Universiti Malaysia Sabah, Malaysia)

11:40 – 12:00 (1570183765) Reporting System Architecture Using Temporary Data Store
Yanuar Firdaus Arie Wibowo (Telkom University, Indonesia), Kusuma Ayu Laksitowening (Telkom University, Indonesia)

12.00 – 13.00 **Lunch Break** – Room : Ballroom (4th Floor)

13.00 – 14.00 **Keynote Speech Session 2**

Big Data: Challenges and Practical Applications,

by Prof. Shi-Jinn Horng

(National Taiwan University of Science and Technology, Taiwan)

14:00 – 16:50 **Parallel Class Session II-A : Informatics Track** – Room : Frangipani (3rd

Floor)

- 14:00 – 14:20 (1570143763) The Effects of Realism Levels of Talking-Head Animated Character on Students' Pronunciation Learning
Mohd Najib Hamdan (Universiti Pendidikan Sultan Idris, Malaysia), Ahmad Zamzuri Mohamad Ali (Universiti Pendidikan Sultan Idris, Malaysia), Anuar Hassan (Universiti Pendidikan Sultan Idris, Malaysia)
- 14:20 – 14:40 (1570151251) Improving Web-Based Problem Solving Skills of Novice Programmers with a Novel Game-Based Intelligent Tutoring System
Danial Hooshyar (University of Malaya, Malaysia), Rodina Ahmad (University of Malaya, Malaysia), Moslem Yousefi (Center of Systems and Machines Intelligence, Universiti Tenaga Nasional, Malaysia), Moein Fathi (University of Malaya, Malaysia), Shi-Jinn Horng (National Taiwan University of Science and Technology, Taiwan), Maral Hooshyar (Islamic Azad University Nour Branch, Iran), Amir Ramezani Dooraki (Technology Park Malaysia, Malaysia)
- 14:40 – 15:00 (1570170833) Developing MESE to Improve Reading Skills for Mental Retardation Children
Munir (Indonesia University of Education, Indonesia), Dedi Rohendi (Indonesia University of Education, Indonesia)
- 15.00 – 15.10 **Coffee Break**
- 15:10 – 15:30 (1570162663) Instructional Animation, Segmentation and User Control Strategies
Anuar Hassan (Universiti Pendidikan Sultan Idris, Malaysia), Ahmad Zamzuri Mohamad Ali (Universiti Pendidikan Sultan Idris, Malaysia), Mohd Najib Hamdan (Universiti Pendidikan Sultan Idris, Malaysia)
- 15:30 – 15:50 (1570191911) An Online Lab for Digital Electronics Course Using Information Technology Supports
Muchlas (Ahmad Dahlan University, Indonesia), M. Andang Novianta (Institute of Science & Technology AKPRIND, Indonesia)
- 15:50 – 16:10 (1570163591) Implementation of Cyber-blog System to Improving Concept Understanding in Algorithm for Students
Wahyudin (Universitas Pendidikan Indonesia, Indonesia), Yaya Wihardi (Universitas Pendidikan Indonesia, Indonesia), Aan Agustan (Universitas Pendidikan Indonesia, Indonesia)
- 16:10-16:30 (1570210577) Identifying Online Learners' Requirements For an Efficient Feedback and Support System
Shireen Panchoo (University of Technology, Mauritius)
- 16:30-16:50 (1570164271) RDB2Onto: An Approach for Creating Semantic Metadata from Relational Educational Data
Dewi Octaviani (Universiti Teknologi Malaysia, Malaysia), Andri Pranolo (Universitas Ahmad Dahlan, Indonesia), Shahizan Othman (Universiti Teknologi Malaysia, Malaysia)

- 14:00 – 16:50 **Parallel Class Session II-B : Informatics Track** – Room : Tulip (3rd Floor)
- 14:00 – 14:20 (1570164093) Dengue Outbreak Prediction for GIS based Early Warning System
Rossticha Anjar Kesuma Tazkia (Center for Pharmaceutical and Medical Technology, Agency for the Assessment and Application of Technology, Indonesia), Anto Satriyo Nugroho (Center for Information & Communication Technology, Agency for the Assessment and Application of Technology, Indonesia), Vanny Narita (Center for Pharmaceutical and Medical Technology, Agency for the Assessment and Application of Technology, Indonesia)
- 14:20 – 14:40 (1570164453) Comparison Analysis of Data Mining Methodology and Student Performance Improvement Influence Factors in Small Data Set
Kartika Maharani (Universitas Gadjah Mada, Indonesia), Teguh Bharata Adji (Universitas Gadjah Mada, Indonesia), Noor Akhmad Setiawan (Universitas Gadjah Mada, Indonesia), Indriana Hidayah (Universitas Gadjah Mada, Indonesia)
- 14:40 – 15:00 (1570164155) Recurrent Neural Network Language Model for English-Indonesian Machine Translation: Experimental Study
Andi Hermanto (Universitas Gadjah Mada, Indonesia), Teguh Bharata Adji (Universitas Gadjah Mada, Indonesia), Noor Akhmad Setiawan (Universitas Gadjah Mada, Indonesia)
- 15:00 – 15:10 **Coffee Break**
- 15:10 – 15:30 (1570182145) Detection of Foveal Avascular Zone in Colour Retinal Fundus Images
Hanung Adi Nugroho (Universitas Gadjah Mada, Indonesia), Dewi Purnamasari (Universitas Gadjah Mada, Indonesia), Indah Soesanti (Universitas Gadjah Mada, Indonesia), Widhia Oktoeberza KZ (Universitas Gadjah Mada, Indonesia), Dhimas Arief Darmawan (Universitas Gadjah Mada, Indonesia)
- 15:30 – 15:50 (1570194831) Forecasting Trend Data Using a Hybrid Simple Moving Average-Weighted Fuzzy Time Series Model
Winita Sulandari (Sebelas Maret University, Indonesia), Yudho Yudhanto (Sebelas Maret University, Indonesia)
- 15:50 – 16:10 (1570195925) Altitude Control for Quadrotor with Mamdani Fuzzy Model
Nia Maharani Raharja (Universitas Gadjah Mada, Indonesia), Iswanto (Muhammadiyah University of Yogyakarta, Universitas Gadjah Mada, Indonesia), Oyas Wahyunggoro (Universitas Gadjah Mada, Indonesia), Adha Imam Cahyadi (Universitas Gadjah Mada, Indonesia)
- 16:10 – 16:30 (1570205847) Object Segmentation for Fruit Images Using OHTA Colour Space and Cascade Threshold
Priska Irenda Vasthi (Universitas Diponegoro, Indonesia), Retno Kusumaningrum (Universitas Diponegoro, Indonesia)

- 16:30 – 16:50 (1570183527) Negotiation Strategies for Meeting Scheduling Conflict Management
Rani Megasari (Institut Teknologi Bandung, Universitas Pendidikan Indonesia, Indonesia), Kuspriyanto (Institut Teknologi Bandung, Indonesia), Emir Mauludi Husni (Institut Teknologi Bandung, Indonesia), Dwi Hendratmo Widyantoro (Institut Teknologi Bandung, Indonesia)
- 14:00 – 16:50 **Parallel Class Session II-C : Computer & Control Track** – Room : Dahlia (3rd Floor)
- 14:00 – 14:20 (1570148093) Kansei Engineering-based Sensor for Agro-Industry (KESAN) for Measurement and Monitoring of Worker Performance
Mirwan Ushada (Universitas Gadjah Mada, Indonesia), Tsuyoshi Okayama (Ibaraki University, Japan), Dzikri Rahadian Fudholi (Universitas Gadjah Mada, Indonesia), Atris Suyantohadi (Universitas Gadjah Mada, Indonesia), Nafis Khuriyati (Universitas Gadjah Mada, Indonesia)
- 14:20 – 14:40 (1570148109) Performance Analysis of Aruba™ Wireless Local Area Network Lampung University
Gigih Forda Nama (University of Lampung, Indonesia), Muhamad Komarudin (University of Lampung, Indonesia), Hery Dian Septama (University of Lampung, Indonesia)
- 14:40 – 15:00 (1570152823) Cross-Layer Design of Wireless Multimedia Sensor Network Based on IEEE 802.11e EDCA and H.264/SVC
Emansa Hasri Putra (Universitas Gadjah Mada, Politeknik Caltex Riau, Indonesia), Risanuri Hidayat (Universitas Gadjah Mada, Indonesia), Widyawan (Universitas Gadjah Mada, Indonesia), I Wayan Mustika (Universitas Gadjah Mada, Indonesia)
- 15.00 – 15.10 **Coffee Break**
- 15:10 – 15:30 (1570162963) Design the Smart Board System in Ubiquitous Computing for Teaching and Learning Process
Jefri Yushendri (Gunadarma University, Indonesia), Fiena Rindani (Gunadarma University, Indonesia), Andrey Agassy Cristhian (Gunadarma University, Indonesia), Rustamin (Gunadarma University, Indonesia), Dewi Agushinta R. (Gunadarma University, Indonesia)
- 15:30 – 15:50 (1570169627) Web Based Monitoring and Control of Robotic Arm Using Raspberry Pi
Pandapotan Siagian (Institut Teknologi Del, Indonesia), Kisno Shinoda (Institut Teknologi Del, Indonesia)
- 15:50 – 16:10 (1570148115) Underdetermined Blind Source Separation Based Condition Monitoring
Anindita Adikaputri Vinaya (Universitas Internasional Semen Indonesia, Indonesia), Dhany Arifianto (Institut Teknologi Sepuluh Nopember, Indonesia)
- 16:10 – 16:30 (1570183073) Dynamic Tunnel Switching using Network Functions Virtualization

for HA System Failover

Hery Dian Septama (University of Lampung, Indonesia), Ardian Ulvan (University of Lampung, Indonesia), Robert Bestak (Czech Technical University in Prague, Czech Republic), Gigih Forda Nama (University of Lampung, Indonesia), Melvi Ulvan (University of Lampung, Indonesia)

16:30 – 16:50 (1570212089): Intrusion Prevention in Heterogeneous System based on Behavior Approaches

Deris Stiawan (Sriwijaya University, Indonesia), Ahmad Fali Oklilas (Sriwijaya University, Indonesia), Ahmad Heriyanto (Sriwijaya University, Indonesia), Tri Wanda Septian (Sriwijaya University, Indonesia), Rahmat Budiarto (Albaha University, Saudi Arabia)

Parallel Class Session II-D : Informatics Track – Room : Carnation (3rd Floor)

14:00 – 14:20 (1570148117) Context Sensitive Grammar for Composing Business Process Model Variants

Riyanarto Sarno (Institut Teknologi Sepuluh Nopember, Indonesia), Widyasari Ayu W. (Institut Teknologi Sepuluh Nopember, Indonesia), Nurul Fajrin A. (Institut Teknologi Sepuluh Nopember, Indonesia), Djauhar Manfaat (Institut Teknologi Sepuluh Nopember, Indonesia), M. Sholikhhan Arif (Institut Teknologi Sepuluh Nopember, Indonesia), Imam Baihaqi (Institut Teknologi Sepuluh Nopember, Indonesia)

14:20 – 14:40 (1570162109) High Quality Image Steganography on Integer Haar Wavelet Transform using Modulus Function

Prajanto Wahyu Adi (Universitas Dian Nuswantoro, Indonesia), Farah Zakiyah Rahmanti (Universitas Dian Nuswantoro, Indonesia), Nur Azman Abu (Universiti Teknikal Malaysia Melaka, Malaysia)

14:40 – 15:00 (1570148101) Developing Workflow Patterns based on Functional Subnets and Control-Flow Patterns

Riyanarto Sarno (Institut Teknologi Sepuluh Nopember, Indonesia), Widyasari Ayu Wibowo (Institut Teknologi Sepuluh Nopember, Indonesia), Dwi Sunaryono (Institut Teknologi Sepuluh Nopember, Indonesia), Abdul Munif (Institut Teknologi Sepuluh Nopember, Indonesia)

15:00 – 15:10 **Coffee Break**

15:10 – 15:30 (1570164087) Web service Similarity with Standardized Descriptions

Budi Harjo (Universitas Dian Nuswantoro, Indonesia), Riyanarto Sarno (Institut Teknologi Sepuluh Nopember, Indonesia), Siti Rochimah (Institut Teknologi Sepuluh Nopember, Indonesia)

15:30 – 15:50 (1570209221) A Comparison between Natural and Head/Tail Breaks in LSI (Landslide Susceptibility Index) Classification for Landslide Susceptibility Mapping : A Case Study in Ponorogo, East Java, Indonesia

Arif Basofi (Politeknik Elektronika Negeri Surabaya, Indonesia), Arna Fariza (Politeknik Elektronika Negeri Surabaya, Indonesia), Ahmad Syauqi Ahsan (Politeknik Elektronika Negeri Surabaya, Indonesia), Imam Mustafa Kamal

(Politeknik Elektronika Negeri Surabaya, Indonesia)

- 15:50 – 16:10 (1570211499) Innovative Algorithm for Easing VIP's Navigation by Avoiding Obstacles and Finding Safe Routes
Amir Ramezani Dooraki (Technology Park Malaysia, Malaysia), Danial Hooshyar (University of Malaya, Malaysia), Moslem Yousefi (Center of Systems and Machines Intelligence, Universiti Tenaga Nasional, Malaysia)
- 16:10 – 16:30 (1570182787) Preferred Model of Dialog Style in Expert System of Physical Examination of Skin Disease
Fajar Suryani (Islamic University of Indonesia, Indonesia), Izzati Muhimmah (Islamic University of Indonesia, Indonesia), Sri Kusumadewi (Islamic University of Indonesia, Indonesia)
- 16:30 – 16:50 (1570209129): Flood Risk Mapping of Bengawan Solo River in East Java Using the Analytic Hierarchy Process and Head/Tails Break Classification
Arna Fariza (Politeknik Elektronika Negeri Surabaya, Indonesia), Jauari Akhmad Nur Hasim (Politeknik Elektronika Negeri Surabaya, Indonesia), Haris Rahadianto (Politeknik Elektronika Negeri Surabaya, Indonesia)
- 14:00 – 16:50 **Parallel Class Session II-E : Information System Track** – Room : Heliconia (3rd Floor)
- 14:00 – 14:20 (1570164311) Applying Theory of Constraints (TOC) in Business Intelligence of Higher Education: A Case Study of Postgraduates by Research Program
Shamini Raja Kumaran (Universiti Teknologi Malaysia, Malaysia), Mohd Shahizan Othman (Universiti Teknologi Malaysia, Malaysia), Lizawati Mi Yusuf (Universiti Teknologi Malaysia, Malaysia)
- 14:20 – 14:40 (1570164353) E-Business Evolution in Indonesian B2B Manufacturing SMEs: An Exploratory Study
Singgih Saptadi (Diponegoro University, Indonesia), Iman Sudirman (Bandung Institute of Technology, Indonesia), TMA Ari Samadhi (Bandung Institute of Technology, Indonesia), Rajesri Govindaraju (Bandung Institute of Technology, Indonesia)
- 14:40 – 15:00 (1570164517) Significance of Data Integration and ETL in Business Intelligence Framework for Higher Education
Nur Alia Hamizah Mohamad Rodzi (Universiti Teknologi Malaysia, Malaysia), Mohd Shahizan Othman (Universiti Teknologi Malaysia, Malaysia), Lizawati Mi Yusuf (Universiti Teknologi Malaysia, Malaysia)
- 15:00 – 15:10 **Coffee Break**
- 15:10 – 15:30 (1570181075) Knowledge Management Strategy Model for Small to Medium Enterprises
Angellia Debora Suryawan (Bina Nusantara University, Indonesia), Eryco Putra (Bina Nusantara University, Indonesia), Ayu Pratiwi (Bina Nusantara University, Indonesia)

- 15:30 – 15:50 (1570163675) A Methodology in Selecting Enterprise Architecture Framework for Corporate Information Factory
Amarilis Putri Yanuarifani (Telkom University, Indonesia), Kusuma Ayu Laksitowening (Telkom University, Indonesia), Yanuar Firdaus Arie Wibowo (Telkom University, Indonesia)
- 15:50 – 16:10 (1570186803) Research Classification in Strategic Information System Planning Development: A Critical Review
Asep Wahyudin (Indonesia University of Education, Indonesia), Zainal A. Hasibuan (University of Indonesia, Indonesia)
- 16:10 – 16:30 (1570209309) Assessment to COBIT 4.1 Maturity Model Based on Process Attributes and Control Objectives
Teduh Dirgahayu (Universitas Islam Indonesia, Indonesia), Dwiyono Ariadi (Universitas Islam Indonesia, Indonesia)
- 16:30 – 16:50 (1570211575) Generic Shopping Mall Directory Mobile Application
Yana Hendriana (Universitas Ahmad Dahlan, Indonesia), Andri Pranolo (Universitas Ahmad Dahlan, Indonesia), Sarina Sulaiman (UTM Big Data Centre, Universiti Teknologi Malaysia, Malaysia), Lee Hui Fong (UTM Big Data Centre, Universiti Teknologi Malaysia, Malaysia)
- 14:00 – 14:40 **Parallel Class Session II-F : Information System Track – Room : Lotus (3rd Floor)**
- 14:00 – 14:20 (1570168059) Wireless Monitoring for Big Data Centre Server Room and Equipments
Evizal Abdul Kadir (Universitas Islam Riau, Indonesia; Big Data Centre, Universiti Teknologi Malaysia, Malaysia), Siti Mariyam Shamsuddin (Big Data Centre, Universiti Teknologi Malaysia, Malaysia), Shafaatunnur Hasan (Big Data Centre, Universiti Teknologi Malaysia, Malaysia), Sri Listia Rosa (Universitas Islam Riau, Indonesia)
- 14:20 – 14:40 (1570164507) The Impact of Internet Technology On Creating New Positions in Indonesia, Study case : Companies in Jakarta
Yuliana Lisanti (Binus University, Indonesia), Devyano Luhukay (Binus University, Indonesia), Veronica (Binus University, Indonesia)
- 18.00 – 19.30 **Dinner**
- 19.30 – 20.30 **Closing Ceremony**
1. Best Paper Award
 2. Memorandum of Understanding Signing Ceremony
 3. Invitation to ICSITech 2016 by Rector University of Mulawarman
 4. Miscellaneous Information
 5. Closing

Day 2: Wednesday, October 28th, 2015

08:00 – 16.00 **City Tour**

Keynote Speakers Biography

Siti Mariyam Shamsuddin (Professor, Big Data Centre, Universiti Teknologi Malaysia, Malaysia)

Prof. Dr. Siti Mariyam Shamsuddin received her Bachelor and Master degree in Mathematics from New Jersey USA, and Phd in Pattern Recognition & Artificial Intelligence from Universiti Putra Malaysia (UPM), MALAYSIA. She has published many journals and conference papers. Her research interests include Big Data Computing, Machine Learning, Soft Computing, Pattern Recognition, Biometrics systems and Intelligent Graphics. She was a Head of R & D Cluster of Engineering and ICT, UTM from 2007 until 2009, Head Department of Computer Graphics and Multimedia from 2001 until 2006, and Head, Soft Computing Research Group, UTM, from 2000 until April 2014. Currently, she is a Director, UTM Big Data Centre. She is also Editor-in-Chief, International Journal of Advances in Soft Computing & Its Applications (<http://www.home.ijasca.com>), and reviewers of many international reputable journals related to her fields. She can be reached at mariyam@utm.my or sitimariyams@gmail.com.

Rafał Dreżewski (Assist. Professor, AGH University of Science and Technology, Poland)

Rafał Dreżewski obtained the Ph. D. degree in 2005. His research interests include bio-inspired artificial intelligence techniques and agent-based modeling and simulation of complex and emergent systems. Dr. R. Dreżewski is the author of more than 60 publications, mainly in the area of artificial intelligence, evolutionary algorithms, and multi-agent systems. He was the member of the technical committee of Congress on Evolutionary Computation 2008 and the member of the programme committee of the workshop on Evolutionary Computation in Finance and Economics (EvoFIN) organized within EvoStar conferences, the International Conference on Parallel Problem Solving From Nature, Agent-Based Simulations, Adaptive Algorithms and Solvers workshop organized within ICCS conferences and International Conference on Simulated Evolution And Learning. He is the reviewer of the IEEE Transactions on Evolutionary Computation, European Journal of Operational Research, Entropy, International Journal of Applied Mathematics and Computer Science, Journal of Zhejiang University - Science A and Journal of Computational Science. He gives lectures on modeling and simulation and was the supervisor of more than 90 successfully completed master of science and engineering theses.

Shi-Jinn Horng (Distinguished Professor, National Taiwan University Sains & Technology, Taiwan)

SHI-JINN HORNG received the B.S. degree in electronics engineering from the National Taiwan Institute of Technology, the MS degree in information engineering from the National Central University, and the Ph.D. degree in computer science from the National Tsing Hua University in 1980, 1984, and 1989, respectively. He was a professor and dean of the College of Electrical Engineering and Computer Science, National United University, Miaoli, Taiwan from 2006 to 2009. Currently, he is the Chair and a distinguished professor in the Department of Computer Science and Information Engineering, National Taiwan University of Science and Technology. He

has published more than 190 research papers and received many awards; especially, the Distinguished Research Award between 2004 and 2006 from the National Science Council in Taiwan; Outstanding IT Elite Award, in 2005; Outstanding EE Prof. Award, the Chinese Institute of Electrical Engineering; and the Outstanding Research and Invention Award between 2006 and 2008 from National Taiwan University of Science and Technology. He was also promoted to the Chair professor in National United University in 2008. His research interests include Information Security, Data Mining, VLSI design, multiprocessing systems, and parallel algorithms.

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Generic Shopping Mall Directory Mobile Application

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Abstract—Directory is defined as a board in an organization or large store listing names and locations of departments, individuals and others. Directory is important as guidance to people because it provides information about the mall such as list of shops and locations of the shops. Some of the directory boards are difficult to find, especially in the big shopping mall. Generic Shopping Mall Directory Mobile Application (GSMD) with the web-based support system is proposed to make the searching of information of a mall much easier. This application acts as a guide for users in the mall to get the accurate information all the time whenever and wherever they want. This system is supported by the online database server which can be manipulated by the administrator of the shopping mall. The function of this application is to let users know the latest events and promotions that took place at the mall besides providing them a guide at the mall. The methodology used in this project is prototyping model. The main developing languages for this project are Java and PHP programming languages. A usability testing has been conducted at the AEON Taman University to identify the efficiency of GSMD in providing the mall information to users and determine the user's satisfaction on the product. Based on the testing result, GSMD has increased the efficiency in finding the shop in a mall. The users' feedback that GSMD is useful and convenient as it helps them to find the information that they want in the shortest time. As a conclusion, GSMD can be used as guidance for users in the mall to get the accurate information all the time.

Keywords—generic shopping mall; mobile application; mobile directory; mobile recommender system; usability testing

I. INTRODUCTION

Nowadays, there are many shopping malls in Malaysia especially at Kuala Lumpur. Shopping mall is important for customer because it provides almost everything they need all under one roof. Hence, the bigger the shopping mall, the more things and services that they can provide. Shopping mall should have at least one directory board for each level. This facility is the most important thing that should have in the shopping mall. However, having a static directory board is troublesome for user as user need to walk to the directory board to seek for information. Therefore, a mobile application which provides the directory of the shopping mall will be useful at this moment. Generic Shopping Mall Directory

(GSMD) is an application which acts as a guide for user. The directories are divided according to their category such as fashion, food and beverages, health and fitness and others. When user tap on one of the category, for example, fashion, a list of all fashion shops and boutiques that are available in the mall will be displayed on the screen. User can tap on the shop or boutique to view the details and the location of the shop. Apart from that, user can view the floor plan for each level of the mall. There is also a section for events and promotions in this application. Through this application, user can view the events and promotions that are held in the mall. Information of the mall and how to get to the mall are also shown in this application.

The paper is structured as follows: An overview of GSMD is presented in Section 2. In Section 3, methodology before built the GSMD application. Section 4 describes result and discussion about this application, and finally Section 5 concludes the paper.

II. LITERATURE REVIEW

A shopping mall needs to have a good directory boards with the most updated information. This is to guide and direct users to the right path with the accurate information. Thus, it will help users to save time. Poor directory will lead the users to a wrong path and make them confuse about the orientation of the shopping mall. They might get lost in the mall. This is a reason why a shopping mall directory application is indeed very useful to user. This section explains about the information, methods that will be used to build this application and related application.

A. Shopping Mall

According to Oxford Dictionaries, a mall which is also known as a shopping mall is a large building or series of connected building containing a variety of retail stores and typically also restaurants [1]. A shopping mall is a place with multi-functional purpose such as entertainment, business, medical, food, shopping and an accommodation center [2].

Many people like to go to shopping mall to do their shopping especially on weekends. People usually love to shop at shopping mall because of the comfortable environment

whereby it is air-conditioned and they can get everything they need at one stop. Many shops are available in a shopping mall such as boutique, restaurants, bookstores, IT stores and so on. It is good to have a variety of shops under one roof. In addition, it becomes the meeting point for adolescents, a workplace for adult, and an eating destination for families and an entertainment center for kids. It is also a place that appeals for all group, ages and classes to have their gathering at the shopping mall.

B. Directory

According to Oxford Dictionaries, directory is defined as a board in an organization or large store listing names and locations of departments, individuals and others [1]. Directory is important as guidance to people because it provides information that is needed and guides them to the correct route. Directory board in a shopping mall contains the information about the mall, list of shops and locations of the shops. The specified directory will be designed in the form of a mobile so that it becomes a mobile directory. Mobile directory is designed to provide easy, real time access to the directory via a mobile device, so it can provide the right solution, quickly and accurately.

C. Android

Android is a Linux-based operating system developed by Android [3, 4, 5], which backend financially by Google. It is designed for smart phones and tablet computers which become the most popular mobile platform in the world. Millions of people use Android to make their mobile devices so powerful and useful. Android was developed jointly by Google, HTC, Intel, Motorola, Qualcomm, T-Mobile, and NVIDIA who are members of the OHA (Open Handset Alliance) with the aim of making an open standard for mobile devices.

D. Mobile Recommender System

Mobile recommender system [6, 7] is one of the growing areas of research under recommender system. Recommender systems are information search tools that have been proposed to cope with the "information overload" problem which is the typical state of a web user, of having too much information to make a decision or remain informed about a topic [8]. In order to solve the problem, recommender systems were developed by aiding users in the search for relevant information. Besides that, it also helped users to identify which products are worth for detailed viewing [9]. Recommender systems are classified into 4 main categories which are collaborative-based [9], content-based [10], knowledge-based [8] and hybrid [11]. There are 3 fundamental directions for recommender systems. They are user mobility, device portability and wireless connectivity [8]. This project application will consists of all 3 fundamental as it can be accessed by user in different locations. For Android development, Global Positioning System (GPS) and Android's Network Location Provider can be utilized to acquire the location of the user [5, 12]. Mobile recommender system helps user to search for the relevant information [6, 7]. This project will be based on 3 categories from this recommender system which are content-based,

knowledge-based and hybrid categories to provide the relevant information of the shopping mall to the user.

E. Development Technologies

Combination of different languages would help in developing a new application according to the requirements. Therefore, choosing the correct languages could prevent some unnecessary mistakes as well as making the development more efficient. Next is the review of the 3 languages which is XML [13], PHP [14] and SQL [15] including Eclipse [16, 17] that will be used to develop the new application.

F. Related Systems

GSMD development can be seen also from identifying the advantages and disadvantages of some of the current application or something similar on the market several sites such as Pavilion Kuala Lumpur, AEON sites and applications MyMall Pavilion. The strength of the existing system can be implemented into the development GSMD while the weakness of the system can be avoided during application development. The following is a general overview of things to be learned and the weaknesses of the existing system:

TABLE I. THINGS TO LEARN AND THE WEAKNESS OF THE EXISTING SYSTEM

System	Things to learn	Weaknesses
Pavilion Kuala Lumpur	<ol style="list-style-type: none"> 1. The directory is well organized, each of the shops are categorized to their related fields. 2. Coming events can be found by user at event and promotion part. 3. A brief description about the mall is given, as well as the way of reaching the mall by different kind of transports. 4. The feedback section is a good way to receive customer's opinion for further improvement. 	<ol style="list-style-type: none"> 1. The application does not function well as expected, this can be proved when users are trying to view the floor plan and there is a bug occurs. 2. Not user friendly when viewed using mobile devices.
AEON	<ol style="list-style-type: none"> 1. Provide a space for company history and any related information which can help customers to know more about the company 2. Any events and current status can be updated to the 	<ol style="list-style-type: none"> 1. No directory provided in the online website system, no reference for the customers 2. Directory board in the mall are not frequently updated by the administrator

	system allows users to catch up what is actually happening at the mall	3. Not getting in their business with the usage of available technology is a big loss
MyMall Pavilion	<ol style="list-style-type: none"> 1. Design the icon which is big and clear enough for user to see and read 2. Categorized the shops according to category for fast and efficient searching 3. Provide a space for events and promotion held at the mall 4. Provide a space for customer to give feedback on the mall 	<ol style="list-style-type: none"> 1. Does not allow information update services 2. Floor plan is not working properly and confusing

After comparing the 3 systems, it is cleared that some of the features are important and must have in the development of GSMD mobile application. Hence, the development technologies that would be used in the development of this new application have been decided. The following section describes the development technologies that will be used to develop GSMD mobile application.

III. METHODOLOGY

Prototyping model is a system development method whereby a prototype is built, tested and reworked when necessary until an acceptance prototype is achieved. Prototyping model consists of 6 phases which are project planning phase, requirement analysis phase, design phase, testing phase, implementation phase and maintenance phase as shown in this section.

A. Project Planning

Initial investigation phase is a process of studying the system's request and preparing a recommendation [18]. The followings are the activities that have been carried out:

- 1) Browse through the internet to search for the information of the project title. Collect more information about the project title from journals or books from the library.
- 2) Study and do research on a few current or similar applications that exist in the market such as Pavilion Kuala Lumpur website, AEON website and MyMall Pavilion application.
- 3) Study the development technologies and tools to build an application. Next, learn to use the software that can be used to develop an Android platform application.

B. Requirement Analysis

Requirement analysis phase is a process to find out the basic requirements of the project application. The purpose of

the requirement is to understand how the application functions and how users interact with the application. In order to collect the information of the requirements, several activities have been conducted as follows:

- 1) Compare the similar systems that exist in the market. Analyze the features and functions of the existing system and choose the most suitable of it for the implementation of GSMD.
- 2) Study and analyze the users' review about the existing system. Revise on their feedback and comments about those systems as their review will affect the features and the user interface of GSMD. Based on the feedback and comments, improvement will be made and implement into GSMD.
- 3) Study the directories of the shopping mall to identify the information that should be available in the project application. In other words, the study of the directories is to understand how to organize the shops into suitable categories.

GSMD is an application which acts as a guide for user. User can check on the information of the mall, view directories, floor plan, event and promotion that are held at the mall. This system allows admin to update the information of the mall anytime he wants. The functional requirements and non-functional requirements will be shown below:

1) Functional Requirement

The aim of GSMD is to provide a guide to user wherever and whenever they need it. User can view the shops in the mall according to their categories. Therefore, the system should organize the shops and category in the form of list to ease the searching processes. Besides that, the system should be able to let the administrator to update the information from time to time.

2) Non-Functional Requirement

The non-functional requirements for GSMD are shown as below:

- a. Data security is controlled with the use of user authentication to prevent the invasion of unauthorized access.
- b. Data in application must be updated every once the application is open by user in condition of Internet connection is available.

Administration system must be limited with the use of session for each log on user in a specified time in order to remove idle users and reduce traffic volume.

IV. RESULT AND DISCUSSION

This chapter explains about step-by-step processes are to ensure the project is running systematically and successfully. There are three main steps design system, development and testing.

A. Analysis and Design System

Analysis and design system is a process based on specified requirements which defines the architecture, components, modules, interfaces and data for a system. System design is important as it is critical for consistency and ease of use. This

section will discuss about the use case and the class diagram for GSMD.

Use case diagram is a diagram which represents the user's interaction with the system and depicting the specification of a use case. Different types of users of a system can interact with the system in various ways. This can be portrayed by the use case diagram. In this application project, there are 2 actors which are user and admin to achieve the goal. We can see at Fig. 1.

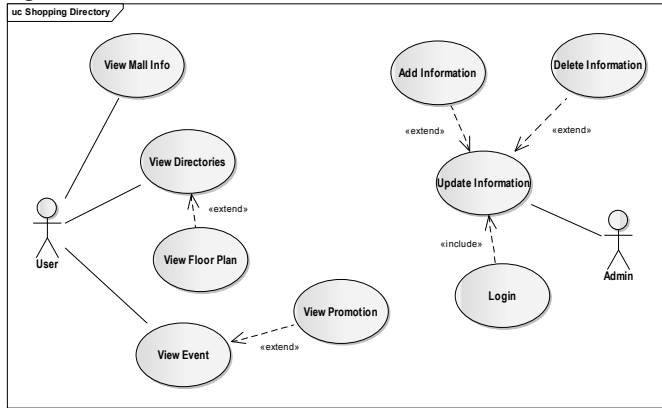


Fig. 1. Overall Usecase Diagram GSMD

Actor is the role played by the user or some other system when interacting with the system. User can use all the functions in GSMD except for updating functions. Admin can fully utilize all the available functions in GSMD as shown in Fig. 2.

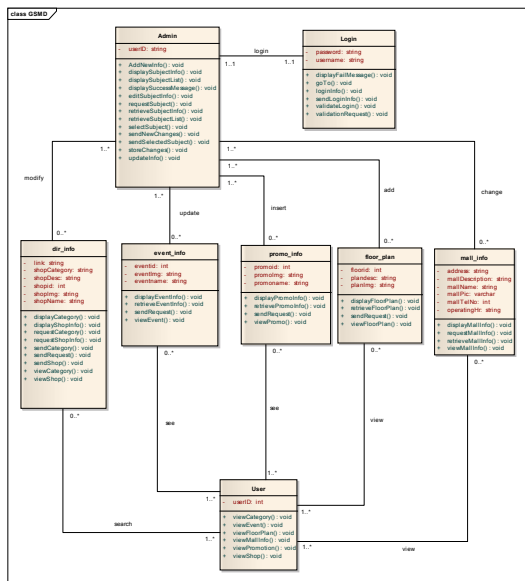


Fig. 2. GSMD Class Diagram

B. Development

The results will be the application that is developed in this project. The following subsections will discuss on the interface of GSMD with the functions of each modules. The modules include mall info, store, event, promotion and floor plan. This application will be used by the customer. There are 5 functions in this application which are home function, store

function, event function, promo function and plan function. The application built in mobile application and website.

Fig. 3 illustrates the Home page for the application. At this page, the picture of the shopping mall is displayed. Below the picture is the information of the mall such as mall history, operating time, address and website. The information may be varied according to malls. It depends on the admin to update the information that they want to this page.

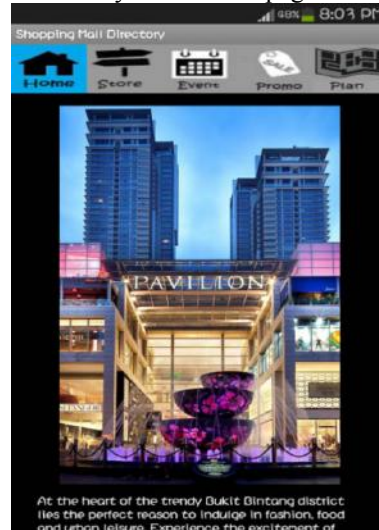


Fig. 3. Home page

User can view the stores which are available at the mall in this page. The stores are categorized according to their category as shown in Fig. 4. This make the searching more efficient and well organized. After selecting one of the categories, for example, "Beauty & Personal Care" category, the list of shops under that category will be displayed. User can view the information of the selected shop as illustrated in Fig. 4. User can find the location and contact number of the shop in this page.

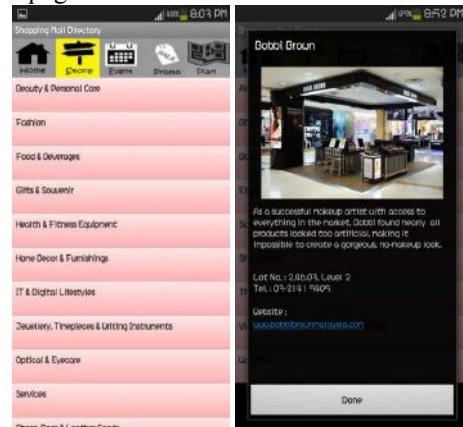


Fig. 4. Store page

After retrieving the shop information from the *sqlite* database, the algorithm can be seen from Fig. 5 will start to dismiss the progress dialog that preventing user from doing anything while the retrieval process is running. Then, the program will put all the information into the elements defined in the interface layout in XML, by throwing all the data into an adapter (ListAdapter).

```

get data with json encode
set list data by shopcategory
if not message equal (" ") then
view list data
else end message
endif
    
```

Fig. 5. Algorithm for dismiss progress dialog

In the event page, user can obtained the latest information of the event, which is held at the mall. User can view the details of the event by tapping on the selected event on the list. After that, a window will pop out showing user the information of the event. The algorithm for display the image as shown in Fig. 6.

```

set variable name, imgtv : string
set button touch
if button on click then
view image with name
view image zoom in 5
else view list data
endif
    
```

Fig. 6. Algorithm for show the picture

Furthermore, user can zoom and pan the image to have a better view. User can get to know the details of the promotions that are held at the mall at promo page. When user select on one of the promotions, a window will pop out showing the information of the promotion. Moreover, user can zoom and pan the image to have a better view on the details of the promotion. The purpose of this page is to let user to view the floor plan of the mall. When user taps on the plan button. User can view the floor plan of each level. By tapping on the selected level, a window will pop out the floor plan of that level. User can now zoom and pan the image to have a better view of the information provided in the image.

Website will be used by admin to manage the information of the mall can be shown in Fig. 8. There are 7 main functions in this application which are mall information, store, promotion, event, floor plan and manage user. The algorithm for login as depicted in Fig. 7.

```

set username and password
if username and password is true than
start the session
set header to dashboard edit
else error message and set login page
endif
    
```

Fig. 7. Algorithm login

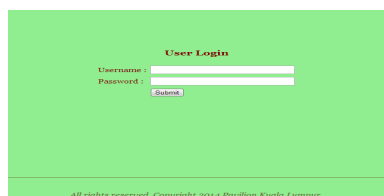


Fig. 8. Website login

C. Usability Testing

Usability testing is a technique to evaluate a product or service by testing it with users and used in user-centered

interaction design. During the test, user will try to complete the typical tasks while observers watch, listen and take notes. The aim of this test is to identify the usability problem and determine the user's satisfaction on the product [19]. For this project, a usability test is carried out to test the functionality and interactive design of the application. 5 users are selected for this test and 2 tasks are given. Testing was conducted to 5 users are considered sufficient because in addition it can save research budgets, 5 users are able to find 85% of usability issues and can be quickly solved [20]. Time is taken for each user to complete the task is recorded. Comments and feedbacks are collected at the end of the test. The data collected is analyzed and the result is presented in the next section.

The testing was done at AEON Taman University on 18th April 2014. The 5 users selected come from different background as shown in Table 1 and the time take to complete each task are shown in Table 2. The mean and standard deviation for each task is calculated. A bar chart of time taken for each user to complete the task is depicted in Fig. 9.

TABLE II. BACKGROUND OF THE USERS

User	Gender	Age	Occupation	Data Plan
A	Male	18-25	Student	No
B	Female	18-25	Student	Yes
C	Female	18-25	Student	Yes
D	Female	18-25	Student	Yes
E	Male	18-25	Student	Yes

TABLE III. TIME TAKEN FOR EACH TASKS, MEAN AND STANDARD DEVIATION FOR EACH USER

User	Task 1 (Second)	Task 2 (Second)
A	288	60
B	222	58
C	168	59
D	294	59
E	312	61
Mean	256.80	59.40
Standard Deviation	53.85	1.02

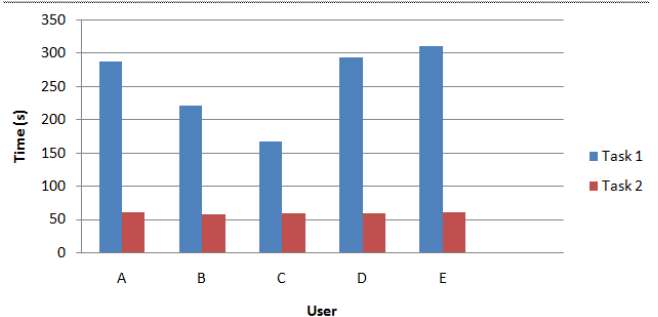


Fig. 9. Bar chart of time taken by each user to complete the task

Two tasks were given to the users. For Task 1, users have to find the shop named “Eu Yan Sang” without using the application. For Task 2, users have to locate the shop named “Focus Point” by using the application. The time taken to complete the tasks is recorded.

1) Task 1

The mean and the standard deviation for task 1 are 256.80 seconds and 53.85 seconds respectively. The standard deviation is high for task 1 because there is more variation of the result around the mean. From the result, users B and C are within the range of the mean whereas users A, D and E are out of the range. User E took the longest time to complete the task because he never knew that there is a shop named Eu Yang Sang at this mall. So, he searches up and down to locate the shop. He did not realize that Eu Yan Sang is just opposite of Sushi King. Users A and D have the difficulty to locate the shop as this shop is located at a corner in the mall.

2) Task 2

For task 2, the mean and standard deviation are 59.40 and 1.02 respectively. The standard deviation for this task is low because there is little variation of the result around the mean. All users can complete the task in around 1 minute when using the application to locate the shop. GSMD provides user with the location of the shop. By looking at the lot number of the shop, user can easily find the shop in the shortest time.

V. CONCLUSION

This paper tell about the GSMD. GSMD acts as a guide for user in the shopping mall. The directories are divided according to their category such as fashion, food and beverages, health and fitness and much more. When user tap on one of the category, for example, fashion, a list of all fashion shops and boutiques that are available in the mall will be displayed on the screen. User can tap on the shop or boutique to view the details and the location of the shop. Apart from that, user can view the floor plan for each level of the mall. There is also a section for events and promotions in this application. Through this application, user can view the events and promotions that are held in the mall. As overall, it can be summarized that GSMD gives a lot of advantages to Android users who like shopping very much. Besides that, this application can help those who have no sense of direction to locate the store that they desire to go. User can save their time in finding the shops which are available at the mall. This is because all the information can be obtained from this application without having to search for the directory board in the mall. It is hope that more mobile shopping malls’ navigator [21] or directory and other interesting features can be added to achieve user’s requirement. Hence, we hope that this project can be continued in future to give more benefits to the users.

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