



UUM
Universiti Utara Malaysia

www.kmice.cms.net.my

ISSN 0128-0511

Proceedings of

KNOWLEDGE MANAGEMENT

International Conference (KMICE)

29 - 30 August 2016

Chiang Mai, Thailand



MAIN ORGANIZER:
College of Arts & Sciences
Universiti Utara Malaysia



CO-ORGANIZER:
Rangsit University
Thailand

Supported by:



Proceedings of Knowledge Management International Conference (KMICe) 2016

Editors:

Assoc. Prof. Dr. Fauziah Baharom

Assoc. Prof. Dr. Yuhani Yusof

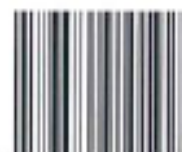
Assoc. Prof. Dr. Haslina Mohd

Mr. Nurnasran Puteh

Copyright © 2016 UUM College of Arts and Sciences.

Published biannually by School of Computing, College of Arts and Sciences, Universiti Utara Malaysia.

ISBN 978-967-0910-19-2



9 789670 910192

eISBN 978-967-0910-20-8



9 789670 910208

All Rights reserved. No part of this publication may be reproduced in any form or by any means without prior permission from the copyright holder.

Printed in Malaysia.

This proceeding is also published in electronic format
KMICe website <http://www.kmice.cms.net.my>

KMICe2016 WORKING COMMITTEE

ADVISOR

Professor Dato' Seri Dr. Mohamed Mustafa Ishak (Vice-Chancellor of Universiti Utara Malaysia)
Dr. Arthit Ourairat (Rangsit University, Thailand)

CONFERENCE CHAIR

Prof. Dr. Norsuhada Shiratuddin

VICE CHAIRPERSON

Assoc. Prof. Dr. Haslina Mohd

TREASURER

Ms. Aniza Mohamad Din

SECRETARY

Dr. Rahayu Ahmad

PROMOTION & PUBLICITY

Dr. Mohd Shamrie Sainin
Dr. Azizi Ab Aziz
Dr. Rohaida Romli
Mrs. Musyfirah Mahmud

SECRETARIAT

Dr. Sobihatun Nur Ab Salam
Dr. Siti Mahfuzah Sarif
Mrs. Rozita Saad

FINANCE & SPONSORSHIP

Prof. Dr. Norsuhada Shiratuddin
Assoc. Prof. Dr. Fauziah Baharom
Dr. Mohd Shamrie Sainin
Mr. Mohd Samsu Sajat

LOGISTICS & TRANSPORTATION

Mr. Mohd Samsu Sajat
Mr. Suwannit Chareen
Srisawad Yongyut (RU, Thailand)
Pinthong Kongka (RU, Thailand)
Thanadetch Thanaakaradetch (RU,
Thailand)

ACCOMMODATION

Mrs. Noraziah Che Pa
Dr. Nor Laily Hashim

LOCAL ARRANGEMENT

Prof. Dr. Rusli Bin Hj Abdallah (UPM)
Prof. Dr. Norita Md Norwawi (USM)
Prof. Madya Dr. Azizah Bta Suliman (UNITEN)
Dr Dayang Nur Fatimah binti Awang Iskandar (UNIMAS)
Dr. Mohammad Nazir Ahmad (UTM)
Dr. Manmeet Mahinderjit Singh (USM)
Dr Shuzlina Abdul Rahman (UiTM - Shah Alam)
Dr Suraya Binti Hamid (UM)
Dr. Nik Zulkarnaen Bin Khidzir (UMK)
Mrs. Dayang Hanani binti Abang Ibrahim (UNIMAS)
Mrs. Ruznida Romli (UNIMAP)
Mrs. Siti Rafidah Muhamat Dawam (UiTM)
Mr. Mohd Helmy Bin Abd Wahab (UTHM)
Natalya Rudina Shamsuar (MMU)
Mohd Nizam B Osman (UiTM - Perlis)
Dr. Hibo Bosim Alwon Al-Duloimi (Al-Mansour University College, Iraq)
Assoc. Prof Dr. Ismail Rakip Karas (Karabuk University, Turkey)

KMICe2016 TECHNICAL COMMITTEE

Publishing Chair: Assoc. Prof. Dr. Fauziah Baharom
Proceeding Committee: Assoc. Prof. Dr. Yuhanis Yusof
Mr. Nurazran Puteh
Prof. Dr. Shahizan Hassan
Dr. Massudi Mahmuddin

Board of Reviewers:

INTERNATIONAL

Prof. Dr. Binod Kumar, *India*
Prof. Dr. M. Aruna, *India*
Prof. Dr. Ali Yuzici, *Turkey*
Prof. Dr. Kisan Sree Pukkuri, *India*
Prof. Alina Badulescu, *Romania*
Prof. Calin Ciufudean, *Romania*
Prof. Erwin B. Daculan, *Philippines*
Prof. Sanjit Setia, *India*
Prof. Witold Chmielarz, *Poland*
Assoc. Prof. Anna Iwona Adamik, *Poland*
Assoc. Prof. Robert Ulewicz, *Poland*
Assoc. Prof. Andreea Zamfir, *Romania*
Assoc. Prof. Petr Hajek, *Czech Republic*
Assist. Prof. Dr. Tebhani Chumwatana, *Thailand*
Assist. Prof. Dr. M.L. Kalthon Kasemsan, *Thailand*
Assist. Prof. Dr. Chetneti Seem-An, *Thailand*
Dr. Agung Sediyono, *Indonesia*
Dr. Florin Molnar-Matei, *Romania*
Dr. Hiba Basim Alwan Hussain Al-Dulaimi, *Iraq*
Dr. Nordin Abu Bakar, *Japan*
Dr. Sombson Anskritmongkol, *Thailand*
Assist. Prof. Mohd. Marsof Siddiqui, *India*
Mr. Sitali Waramsila, *Zambia*
Ms. Ichayaporn Chuaychoo, *Thailand*

NATIONAL

Dato Prof. Dr. Mohd Idrus Hj Mohd Masirin
Prof. Dr. Hishamuddin Md Som
Prof. Dr. Shahizan Hassan
Prof. Dr. Norshahada Shiratuddin
Prof. Dr. Tong-Ming Lim
Assoc. Prof. Dr. Abdelnasser Omran Ali
Assoc. Prof. Dr. Azman Yusof
Assoc. Prof. Dr. Ibtisam Abdul Wahab
Assoc. Prof. Dr. Ruzaini Bin Abdullah Arshah
Assoc. Prof. Dr. Siti Norazam Othman
Assoc. Prof. Dr. Yip Muen Wai
Assist. Prof. Dr. Hen Kai Wah
Assoc. Prof. Dr. Shafiq Affendi Mohd Yusof
Dr. Adam Mohd Saifudin
Dr. Aziz Bin Ab Aziz
Dr. Azman Tau
Dr. Azrul Haeri Jaetan
Dr. Christine Nya-Ling Tan
Dr. Fauziah Pangil
Dr. Haemul 'Aini Et. Hambali
Dr. Hazeeruddin Bin Harun
Dr. Iskandar bin Ishak
Dr. Ishola Dada Muraina
Dr. Imani Rajjani
Dr. Jashpal Kaur Bhatt
Dr. Kasturi Dewi Varathan
Dr. Maslinda Mohd Nadzir
Dr. Massudi Mahmuddin
Dr. Mazida Ahmad
Dr. Mazura Mat Din
Dr. Mohammad Bin Hossin
Dr. Mohamed Farhan Mohamed Mohsin
Dr. Mohd Farhan Md Fudzee
Dr. Mohd. Hasbullah Omar
Dr. Mohd Heikal Husin
Dr. Mohd Razlan Abdul Kadir
Dr. Mohd Zafisham Jali
Dr. Muhammad Mat Noo
Dr. Mustafa Mursafik Alabaedy
Dr. Nazri Mohammad
Dr. Ng Keng Hoong
Dr. Noorhan Abdul Rahman
Dr. Nurshikin Ali
Dr. Nor Haflyna Binti Harun
Dr. Nor Intan Sariah Sulaiman
Dr. Nor Lady Hashim
Dr. Nurizan Mohd Yusin
Dr. Nurul Azma Zakaria
Dr. Rahayu Ahmad
Dr. Rohaida Ruzli
Dr. Sami Mohamed Saleh Al Hadari
Dr. Shahrinaz Ismail
Dr. Shahrul Azmi Mohd Yusof
Dr. Siti Mahfuzah Sarif

Dr. Siti Nurul Mahfuzah Mohamad
Dr. Sukumar Letchumanan
Dr. Sufieeza Mohd Drua
Dr. Tan Fee Yean
Dr. Tan Tee Guan
Dr. Zatul Firdi Zaaba
Mr. Azlan Osman
Mr. Feras Zen Alden
Mr. Kuek Thiam Yong
Mr. Mohd Helmy Abd Wahab
Mr. Mohd Ibrahim Hai
Mr. Mohd Rusdi Idris
Mr. Mohd Suffian Sulaiman
Mr. Sanath Sakumaran
Mr. Syahrol Nizam Jusaini
Mr. Yousef Faza
Mr. Zul Hairizal Bin Bohari

Mrs. Anmuthavali ap Ramasamy
Mrs. Juhaida Abu Bakar
Mrs. Lailatul Faizah Abu Hassan
Mrs. Maziani Sabudin
Mrs. Musyriyah Mahmud
Mrs. Norfadzilah Abd Razak
Mrs. Norhairani Abdul Razi
Mrs. Nurfaiza Jali
Mrs. Rafidah Abd Razak
Mrs. Yana Marwin Mohamad Hassim
Ms. Aniza Mohamed Din
Ms. Ina Suryani
Ms. Noraziah Chepa
Ms. Sharmila Mai Yusof
Ms. Shatina Saad
Ms. You'nee Hayati Hj Mohamed Yusof

KEYNOTE SPEAKER

“From Big Data to Knowledge Discovery: A Difficult Journey”

Mr. Scott M. Leeb

Engagement Director, iKnow LLC, Virginia USA

**“Knowledge Management System as a Tool for
Managing Knowledge of Big Data in a Collaborative Environment”**

Prof. Dr. Rusli Abdullah

Universiti Putra Malaysia, Malaysia

Table of Content

ID	Title	Page
PID4	An Ontology Knowledge Management for a User Preference of E-Learning System Chetneti Sri-an and Nida Denphaisarn, THAILAND	1
PID6	An Experiment on the Performance of Shortest Path Algorithm Simon Chan Yew Meng, Nur'ayuni Adnan, Syazwan Syafiqah Sukri and Wan Mohd Nazmee Wan Zainon, MALAYSIA	7
PID9	Improving Employees Retention Rate Through Knowledge Management and Business Intelligence Components Herison Surtukti and Azman Ta'a, INDONESIA	13
PID17	GPU-based Odd and Even Hybrid String Matching Algorithm Ghazal Rahbari, Nur'Aini Abdul Rashid and Wahideh Hussain, MALAYSIA	18
PID18	Knowledge Sharing Factors Among EIS Students In a Private University Chaleekorn Nuansomri and Suttisak Jantavongso, THAILAND	25
PID20	Decision Making in Local Government: The Myth of Success Model of Information System Mohd Zool Hilmi Mohamed Sewal and Kamarudin Ngah, MALAYSIA	31
PID22	Retaining Knowledge Worker through Motivation Hway-Boon Ong, Lee-Lee Chong and Kasuma Nurhazwani Mohd Hatta, MALAYSIA	35
PID25	A Study on Transforming the Knowledge in Design Learning Environment Nur Aziemah Mohamed, Khairul Anwar Mohamed Khaidzir, and Rohana Ibrahim, MALAYSIA	38
PID26	The Impact of Collection and Dissemination of Information towards Public Complaint on Municipal Services Zaherwati Zakaria, Kamarudin Ngah, Nazri Noordin and Mohd Zool Hilmi Mohamed Sewal, MALAYSIA	44
PID27	The Formulation of New Model of Decision-Making Process in Malaysian Local Government Kamarudin Ngah, Ravindra Nath Vyas, Mohd Fitri Abdul Rahman and Zaherwati Zakaria, MALAYSIA	49
PID29	Amateur Radio Communication Technology Evolution and Issues in Malaysia Azlee Johar, Wan Rozaini Sheikh Osman and Azizi Ab. Aziz, MALAYSIA	54
PID30	A Framework for Correcting Human Motion Alignment for Traditional Dance Training Using Augmented Reality Javid Iqbal and Manjit Singh Sidhu, MALAYSIA	59
PID31	Using Hybrid Technique: the Integration of Data Analytics and Queuing Theory for Average Service Time Estimation at Immigration Service, Suvarnabhumi Airport Todsana Chamwatana and Ichayaporn Chuaychoo, THAILAND	64
PID32	Blended Learning as a Conduit for Inquiry-based Instruction, Active Learning, Formative Assessment and its Impact on Students' Learning Outcomes in Higher Education Chan Yuen Fook, Sathagar Narasuman, Siti Fairuz Dalim, Gurnam Kasir Sidhu and Lee Lai Fong, MALAYSIA	69
PID36	Determination of Corporate Governance Disclosure Christa Subendi and Maya Indriastuti, MALAYSIA	74

PID37	Financial Ratios: Prediction of Changes in Profit Future on Islamic Banks Maya Indriastuti and Luluk Mahimatal Ifada, INDONESIA	78
PID38	Cognitive Dissonance of Online Socialization among Tertiary Students Aiza Johari, Adib Sarkawi, Awang Rozaimie Awang Shuib, Azlina Bujang and Zainon Haji Bibi, MALAYSIA	81
PID39	Developing Knowledge Asset Valuation Model using Knowledge Experts Wong Man Wai, Amruthavali Ramasamy and Marini bt Othman, MALAYSIA	87
PID43	The Factors Affecting Knowledge Sharing Behaviour within a Case Study Taiwanese Small Business Hsing H. Lee, TAIWAN	93
PID44	The Effect of Macro Economy and Characteristics of Company on Beta Syariah Shares Lita Kartikasari, INDONESIA	99
PID45	iHOME: An Ambient Intelligence Mobile CrowdSensing Smart Home System Lim Poon Koon and Manmeet Mahinderjit Singh, MALAYSIA	104
PID46	A Secure Near Field Communication (NFC)-enabled Attendance on Android Mobile for University David Ong Da Wei and Manmeet Mahinderjit Singh, MALAYSIA	110
PID48	Determinants of Collaboration and Innovation in Creative Industries - The Case of the Czech Republic Jan Stejskal, and Petr Hajek, CZECH REPUBLIC	116
PID49	Knowledge Spillover Effects in German Knowledge-Intensive Industries Petr Hájek, and Jan Stejskal, CZECH REPUBLIC	122
PID50	The Optimal LSB Substitution Matrix Technique for Image Hiding Suzchai Suttipong and Somboon Anekritmongkol, THAILAND	128
PID55	Exploring Affective Mediation Digital Training Model for Training of Trainers (ToT) in Education: A Systematic Literature Review Siti Nurhazadilla Omar, Sobihatun Nur bt Abdul Salem and Fauziah Abdul Rahim, MALAYSIA	134
PID60	Inter-organizational Knowledge Transfer Processes: An Integrative Perspective Sommai Khantong and Mohammad Nazir Ahmad, MALAYSIA	138
PID67	Social Information Retrieval for Online Community Question Answering Services Lee Jun Choi, Cheah Yu-N and Cheah Wai Shiang, MALAYSIA	145
PID68	Linking Community of practices and open innovation through absorptive capacity: A conceptual framework for university-industry collaboration Rabiah Eladwish Abdul Rahim, Jursifa Jais and Nor'ashikin Ali, MALAYSIA	150
PID69	Opinion Spanning in Social Media: A brief systematic review Khairul Nizam Baharin and Suraya Hamid, MALAYSIA	156
PID71	Student's Perception to Learning of Innovative Skills through Multi-Dimensional Visualization System: Reliability and Validity Tests of some Measurements Ishola Dada Musirin and Huda Haji Ibrahim, MALAYSIA	162
PID72	Knowledge Management in Indonesia Small and Medium Enterprises (SMEs): A Conceptual Model Arlian Adhistrna and Olivia Fachrumisa, INDONESIA	168

PID73	Knowledge Audit on the Implementation of Knowledge Management in Public Sector Research Institute in Malaysia: A Case Study Harlina Zulkifli, Mohammad Fikry Abdullah dan Mardiah Ibrahim, MALAYSIA	173
PID74	Strategy Mining on University Students' Feedback Angela Lee Siew Hoong and Tong-Ming Lim, MALAYSIA	179
PID75	Knowledge Management, Innovative Intelligence and Sustainable Competitive Advantage in Small and Medium Enterprises Rohana Ngah, Zarina Salleh and Ismail Ab Wahab, MALAYSIA	186
PID77	Behavioral Intention to use Knowledge Sharing Tools : Positive and Negative Affect on Affective Technology Acceptance Model Angela Lee Siew Hoong and Tong-Ming Lim, MALAYSIA	191
PID79	A KM-driven Formative Assessment Framework to Problem-Solving for Law Academics Teaching First Year Non-Law Students Kanchana Chandran, Sanath Saktumaran and Kalpana Chandran, MALAYSIA	197
PID81	Comparative Study of Apriori-variant Algorithms Sofianita Mitalib, Ammar Azri Abdul Subar, Shuzlina Abdul-Rahman and Azlinah Mohamed, MALAYSIA	203
PID82	Benchmarking Process of Knowledge Management Best Practice Model for Higher Learning Institution Halijah Ismail, Rusli Abdullah and Yusmedi Yah Jusoh, MALAYSIA	209
PID83	Knowledge Sharing Behaviour in Libraries: A Case Study of Raja Tun Uda Library, Selangor, Malaysia Azman Mat Isa, Nurul Fakhra Mohd Jemal and Nordiana Mohd Nordin, MALAYSIA	217
PID87	Domain of Application in Context-Aware Recommender Systems: A Review Maizatul Akmar Ismail, Khalid Haruna and Shuhaida Mohamed Shuhidan, MALAYSIA	223
PID88	System Requirement Specifications for A Semantic Knowledge Management System for Collaborative Learning Environment Zahisna Che Cob, Rusli Abdullah, Sulfizza Mohd. Deus and Nor'ashikin Ali, MALAYSIA	229
PID90	Assessing Academics' Knowledge Sharing Intention in Institutions of Higher Learning Christine Nya-Ling Tan, Muhammad Ashraf Fauzi and Ramayah Thurasamy, MALAYSIA	235
PID92	Stock Split Analysis on Price and Trading Volume in Indonesian Stock Exchange Iren Khajar, INDONESIA	241
PID97	An Improved Searching Method for Retrieving Local Knowledge Information Wong Poh Lee, Mohd Azam Osman, Tarmiji Maron and Abdullah Zawawi Talib, MALAYSIA	247
PID98	Knowledge Management Systems Success Model: A Partial Least Square Approach Norashikin Ali, Zahisna Che Cob and Hidayah Salaiman, MALAYSIA	252
PID99	Social Identity, Collective Engagement and Communal Patent for Successful Digital Collaboration Olivia Fachrumisa, Ardian Adhiana and Mustafa, INDONESIA	258
PID101	Observed Demographic Differentials in User Perceived Satisfaction on the Usability of Mobile Banking Applications Emmanuel O.C. Mijorjoga, Nor Lailly Hashim and Rabiu Adama, MALAYSIA	263
PID104	Knowledge Utilization and Decision Making in Construction Projects in Malaysia Ali Mohammed Alshwai and Ng Wen Si, MALAYSIA	269

PDI106	Critical Factors in Developing Knowledge Management Systems Sornath Sakumaran, S.M.F.D. Syed Mustapha and Kanchana Chandran, MALAYSIA	275
PDI112	Malayclone: Usable Mobile Food Finding Application Lee Pui Yen and Zatul Fitri Zaaba, MALAYSIA	284
PDI113	Empowering the Youth Through Online Social Enterprise Income Generation: A Study in Malaysia and USA Noorainizatul Akmar Ishak, Muhamad Zulkiflee Osman, Syed Zulkarnain Syed Idrus, Wan Nor Ashiqin Wan Ali, Azizah Bahari and Nur Azila Azahari, MALAYSIA	291
PDI114	Skills and Competitiveness for Poverty Reduction in Northeast, Thailand by Enhancing Knowledge Management in Capacity Building Framework Thosaporn Thosansin, THAILAND	297
PDI115	A Proposed Framework for Mobile Internet QoS Customer Satisfaction using Big Data Analytics Techniques Ayyiat W. Yusuf-Asaju , Zulkhairi Md Dahalin and Azman Ta'a, MALAYSIA	303
PDI117	Complaint Management in Public Services: A Case Study at Local District Municipal Authority in Malaysia Shatina Saad and Muhammad Halim Nizarwan, MALAYSIA	311
PDI118	The Relationship and Influence of Leadership Style Towards Knowledge Management Activities Ahmad Safi Alewi Idris, Adrian Jamaludin, Abd. Latif Abdul Rahman and Ayuffeimah Mislan, MALAYSIA	317
PDI119	Identifying Game Design Factor for The Development of Educational Digital Games Sunet Pongphankae and Jitrapol Intarasirisawat, THAILAND	323
PDI121	Knowledge Management Initiatives In Contact Centre: A Case Study In Tenaga Nasional Berhad Siti Rafidah Mukiar, Nor'ashikin Ali and Rabiah Eladwiah Abdul Rahim, MALAYSIA	327
PDI122	A Study on the Effects of Window Size on Electrocardiogram Signal Quality Classification Tanatorn Tanantong, THAILAND	333
PDI125	Antecedents Cloud ERP Adoption in Manufacturing Industry: Nigerian SMES Context Usman Musa Zakari Usman, Mohammad Nuzir Ahmad and Nor Hidayati Zakaria, MALAYSIA	339
PDI126	Moderating Effect of Personal Characteristics on Telecentre Adoption for Value Creation Zulkhairi Md Dahalin, Nor Isah Yusop and Zaharin Mat Aji, MALAYSIA	345
PDI130	Multi perspective Analysis the WIFI Performance and Evaluation : Case Study Sengkha Rajabhat University Suzalak Tongkaw and Aummat Tongkaw, THAILAND	351
PDI133	Social Media Literacy and Awareness of the Youth in Secondary school in Southern Thailand Korawan Suchsom and Noppapat Meeplat, THAILAND	356
PDI134	Thai Word Segmentation on Social Networks with Time Sensitivity Chirwan Ronrat, Sayan Unankard, Warwimol Nadee, Nongkran Khomwichai and Rangsit Sirirangsi, THAILAND	362
PDI135	Using Graph Algorithm and Classification Technique for Finding an Optimal Bus Route in Time-Dependent Travel Times Sajjayed Deelertmongkolchai, Todsanai Chamwatana and Choonhapong Thaiupathump, THAILAND	368
PDI136	Filtering Spam Mail in Non-Segmented Languages Using Hybrid Approach: the Integration of Stopword Removal, N-gram Extraction and Classification Techniques Ployphailin Khumsong, Todsanai Chamwatana and Sepanit Augsirikal, THAILAND	373

PID143	Goal-UML Approach for Modeling Data Warehouse Requirements of Malaysian Rural Healthcare Sajaratul Huda Shafie, Azizah Ahmad, and Azman Ta'a, MALAYSIA	379
PID154	Does Difference in Secondary and Tertiary Literacy Influence Life Insurance Consumption in the selected ASEAN countries? Lee Hui Shan, Kevin Low Lock Teng, Chong Shyue Chuan, Sia Bik Kai, MALAYSIA	385
PID155	Lexicon-Based and Immune System Based Learning Methods in Twitter Sentiment Analysis Hamidah Jantan, Fatimatal Zahrah Deahman, Nazirah Alhadi and Fatimah Mamat, MALAYSIA	392
PID156	A Comparative Study of Service-Oriented Architecture Maturity Model Mohd Hamdi Iwan Hanzah, Fauziah Baharom and Haslina Mohd, MALAYSIA	399
PID159	Goal Oriented Measurement for Software Sustainable Evaluation Metric Focused on Environmental Dimension Ruzita Ahmad, Azham Hussain and Fauziah Baharom, MALAYSIA	405
PID161	Social Innovation and Strategic Knowledge Management Processes: A critical conceptual overview Muhammad Nizam Jali, Zakaria Abbas, Ahmad Shabudin Ariffin and Nazim Baluch, MALAYSIA	411
PID164	Relationship of Knowledge Management Cycle and the Performance from Human, Customer and Organizational Perspective Rayinda PramaLitya Soesanto, Luciana Andrawina, Indriani Rezki Pratiwi and Amelia Kurniswati, INDONESIA	416
PID165	Importance Factors Influencing the Thai Doctors in Rural Area to Use Public Social Media for Work-Related Use: A Case Study of LINE Application Nattapong Somsakit, Sreee Faniikul, and Umaporn Supasithimethee, THAILAND	421
PID166	Critical Analysis in Proposing Persuasive Multimedia Model of Truancy Awareness (PMTA) Mohamad Lutfi Dofhalin, Sobihatun Nur Abdul Salam, Ariffin Abdul Mutalib and Muhamad Saiful Bahri Yusoff, MALAYSIA	427
PID167	A Requirement Model of an Adaptive Emergency Evacuation Center Management Nor Laily Hashim, Hanif, Azham Hussain, Norsuziah Che Pa, Yuharis Yusoff, MALAYSIA	433
PID168	The Design and Implementation of Malaysian Indigenous Herbs Knowledge Management System based on Ontology Model Zulazree Sabri, Mohd Eizan Shafiq Abd Aziz, Nazirah Ramli and Roger Carda, MALAYSIA	439
PID169	Estimating the Right Allocation of Doctors in Emergency Department Mohd Ridwan Zulkifli, Muthukkaruppan Annamalai, Kassim Isahak and Rashidi Ahmad, MALAYSIA	446
PID170	Design and Evaluation of a Multilanguage Instant Messaging Application Ahmed Nabeel Ahmed, Suwanni Chareen Chit and Mohd Hasbullah Omar, MALAYSIA	453
PID173	iMoS: Intelligence Monitoring System of HIV Carriers in Thailand Rachasak Sonyanonthanakul and Thanachai Luakrood, THAILAND	459
PID174	Pragmatic Design of Methodology in Process-Based Knowledge Integration Yew Kwang Hooi, Mohd Fadzil B Hassan, Anouar Abrik and Azmi M. Shariff, MALAYSIA	463
PID179	Knowledge Integration Improves Flood Disaster Management: A Case Study of Kemaman Nor Hidayati Zakaria, Mohammad Nazir Ahmad, Mohd Saiful Anuar Mohd Noor and Mazida Ahmad, MALAYSIA	470

PID187	Improving Vehicular Ad hoc Networks (VANET) Communication Performance by using Time Gap Following Distance (TGFD) Model Suzi Iryanti Fadilah, Mohd Helmy Abd Wahab, Azizul Rahman Mohd Shariff, Khuzairi Md. Zaini, Abdul Samad Shohatullah, MALAYSIA	475
PID190	Updating Information in Colored QR Code for Knowledge Sharing Azizi Abas, Yuharis Yusof, and Farzana Kabir, MALAYSIA	480
PID192	The Digital Divide and Behavioral Intention of ICT adoption for Health Information Among People in Rural Communities Nopparat Meepliat and Zulkhairi Md Dahlan, MALAYSIA	486
PID193	Analysis of Contents on Youth Media Participation in Marginalised Communities Norshuhada Shiratuddin and Zainatul Shuhaida Abd Rahman, MALAYSIA	491
PID194	Engaging Youth in Decision-Making Process via New Media: A Case of Rural and Urban Youth in Marginalized Communities in Malaysia Shahizan Hassan, Norshuhada Shiratuddin and Zainatul Shuhaida Abdull Rahman, MALAYSIA	497
PID196	A Review of Three Models for Knowledge Management in Healthcare Zaid A. Sabeeh, SMFD Syed Mustafa and Rohayu Mohamad, MALAYSIA	501
PID197	Fuzzy Distance-based Undersampling Technique for Imbalanced Flood Data Ku Ruhana Ku Mahamad, Maisarah Zorkeflee and Aniza Mohamed Din, MALAYSIA	509
PID198	eBusiness Adoption Studies in Thailand Sattisak Jantavongso, Chuleekorn Nuansomri, Sumana Kasemsawadi, Somboon Anekritmongkol, and Saritkam Sithikraiwong, THAILAND	514
PID199	A Development of Causal Relationship Model of the Google Sites Usage for Learning at Rangsit University Puangtong Udomsil and Suraman Parkhan, THAILAND	521
PID202	Exploring Competitive Competencies for ICT/Tech Startup Ecosystem Towards The Digital Economy in Thailand: An Empirical Competency Development Investigation Kriengkrai Bhuvanij, M.L.Kulthra Kasemsan and Prasong Prasertpolgrong, THAILAND	526

Stock Split Analysis on Price and Trading Volume in Indonesian Stock Exchange

Ibnu Khajar

Sultan Agung Islamic University (UNISSULA), Indonesia, didijon58@yahoo.co.id

ABSTRACT

Stock split is not a new issue in Indonesia Stock Exchange. There are many controversies found in the research results about the impact of the corporation action on the company value and stock trading volume. This study aims to analyze the impact of stock split on stock price and stock trading volume. Four companies incorporated in LQ-45 of Indonesia Stock Exchange become the sample of this research. One sample t-test and paired sample t-test are used as the statistical analysis method. The result shows that corporation action of stock split positively impacts on stock price, but negatively impacts on stock trading volume. The contribution of this research for knowledge management is to add data base and reference in managerial field which then can be used to make investment decisions, especially in long-term financial assets.

Keywords: Stock Split, Stock Reverse, One Sample T-Test, Paired Sample T-Test.

I INTRODUCTION

Investors consider stock split as a signal of the improvement of company performance, while stock reverse is considered as a negative signal of the decrement of company performance. The data of Indonesia Stock Exchange shows that from 66 companies performing corporate action, only 18% of them perform stock reverse, and the rest perform stock split.

The investor belief that stock split is a positive signal is not fully right, as some research findings support the statement and some of them do not. Mishra (2006), Bechmann and Raaballe (2007), and Cakraborty (2012) state that the policy of stock split is merely to polish and does not impact on the stockholders' wealth. The number of stocks may increase but with lower price. However, how the stock price in the future period after the action will be interesting to study. If the stock price in the future period after the action impacts on the stock price improvement, the action will bring benefit to the stockholders because their wealth will be also increased. Yet, if the stock price decreases, the action will pull down their wealth and result lost.

Kurniawati (2003) conducts a research about stock split and notes that there is abnormality on the

announcement of stock split which shows that the stock price decreases after the action. This is different from the study of Waweru and Mwendwa (2012) as it notes that 5 of 10 companies which perform stock split in Nairobi Stock Exchange (NSE) get their stock price increases and 5 of them get the price decreases. The study conducted by Metha, Yadav and Jain (2011) shows that the majority of respondents do not believe that stock split brings positive signal to the company future prospect. Pooja (2013) states that companies performing stock split in India Stock Exchange do not impact the stock price. Ford, H. Nguyen and T. Nguyen (2012) also emphasize that after stock split, the stock price decreases.

Besides, based on the liquidity after stock split, many study results show significant improvement Mishra (2006), Cakraborty (2012), Kurniawati (2003), Waweru and Mwendwa (2012), Metha, Yadav and Jain (2011), Pooja (2013) as well as Ford, H. Nguyen, and T. Nguyen (2012). Based on the research gap, it will be urgent and interesting to study on how the corporation action of stock split in Indonesia Stock Exchange impacts on the stock price and stock trading volume.

Stock split is a form of corporate action performed by go-public companies in Indonesia and many other countries in the world. This research proposes to analyze the condition of stock price and stock trading volume before and after stock split.

II LITERATURE REVIEW

A. Stock Split and Stock Reverse

There are two types of stock split, such as forward split and reverse split (Yan dan Junbo, 2012). Bechmann and Raaballe (2007) explain that forward split is splitting one piece of old stock into a number of new stocks by decreasing the stock nominal value, and the total of stock capital does not change. Jones (2007) states that stock split involves a bigger amount of stocks based on the proportion of outstanding stocks. The existence of stock split makes the value of book and nominal change. For example, each value will be cut if the split ratio is 1:2. Hwang et al (2012) describes reverse split as an unusual event where a company substitutes some stocks with one stock without any changes in the total capitalization of stock capital.

There are some reasons why company performs stock split. As forward split break down one stock into some stocks, it results more stocks than before, but with cheaper price for each. Besides, reverse split merge or combine some stocks into one, hence the price per price increases and the outstanding stock decreases.

B. Stock Price

Stock is a proof of ownership of a company. Those who own stock in a go-public company, whether if it is acquired through stock buying in Stock Exchange or through other way, for example through bonus acquired from the company in a form of stock. Thus, the stock holder roles as stockholder based on the number of stock that he/she has. The more number of stocks a person has, the bigger percentage of ownership of the company.

Stock has some types of prices, such as nominal price and market price. Go-public companies have nominal price and market price both in primary and secondary markets. Unless for stock price in secondary market, the nominal price and primary market price are static. In the development, nominal price will also change if the company performs corporation action like stock split or stock reverse.

In many financial literatures, it is mentioned that a company is built in order to bring benefit and increase the owners' wealth. If a company is operating with benefit, the period of company will cumulatively longer, and the owners' wealth will be bigger. The amount of the rising wealth can be count from the amount of benefit acquired both in cash and other kinds of assets. Special for go-public companies, the amount of the owners' wealth is analogues to the amount of the stockholders' wealth is relatively countable because go-public companies have stock market price (secondary market). Thus, the wealth can simply counted based on the amount of stocks multiplied to the price per stock in the market. The wealth can increase if the company acquires more benefit as the stock price will also increase.

There are two factors why stock price can increase and decrease, such as internal factor (micro) and external factor (macro). The internal factor is reflected from the company condition, such as how the sales and the sales growth are, how the efficiency of the company operational costs is, and how the level of company profit is. The external factor usually cannot be controlled by the company, including bank interest rate, fuel price, electricity, and social politic and law condition. The company stock price will fluctuate if both internal and external factors experience changes.

C. Stock Trading Volume

Stock trading volume can be one of indicators of the market condition whether it is crowded or not. The bigger trading volume, the more crowded the market will be, which means the amount of stock transacted is bigger. Stock trading volume is well-noted in the amount of stocks or the Rupiah value of the stock. The more investors who sell and buy stocks, the higher value of stock trading will be.

There are some ratios used in measuring stock trading volume, such as TVA (Trade Volume Activity), which is the ratio between the number of stocks traded and the number of outstanding stocks. The higher value of TVA, the more stock volume traded will be. Joshipura (2009) uses volume ratio in his research, where if the value is one (1) or almost one (1), the stock trading volume will be considered as normal. Then, if the ration value is less than one (1), the stock trading volume will be considered as abnormal.

H2: There is significant difference of trading volume activity before and after the corporation action of stock split is accepted.

D. Signaling Hypothesis

The information in the management and investors are different and this is reasonable because the internal party directly run the company and face fundamental situation in the company every day. Thus, if the company performs corporation action of stock split, it can be considered as a signal of a better performance of the company or at least it has potential to improve its future performance. If the company stock price is already expensive, even the performance is improving, the stock price cannot significantly pulled up. This possibly happens because the investors cannot buy the stock as the price is too expensive, especially for investors in low-to-medium level. However, lower price of company stock can be benefit because there will be more investors who are able to buy the stock, hence the stock trading volume will increase.

According to signaling hypothesis, managers in a company can use the stock distribution as positive signal of optimistic expectation for investors in the capital market. As internal party, managers usually have estimation dealing with better company prospect than the external party. Thus, the managers can inform their internal information to investors through financial decisions (Powell, Phillips & Baker, 1995).

H1: Stock split positively impact on Stock Price

III RESEARCH METHOD

This research performs event study method to know the impact of an event on security price. This research analyzes the impact of stock split on the stock price and trading volume. The market reaction can be measured through the return or abnormal return around the stock split announcement.

In general, the research method follows the following procedures: (1) collecting sample from company with similar issue, (2) deciding the right day or the *cum-date* (the final date of stock trading with old nominal value of the announcement and is assigned as Day-0), (3) deciding the research period or *event window* as long as 11 days; 5 days before the announcement of corporate action and 5 days after the *cum-date*, (4) calculating the daily stock return for every sample company, (5) calculating the abnormal return (mean adjusted model) of every period in window period for all sample companies from the return acquired, (6) statistically assessing whether the abnormal return is significant or not.

A. Population and Sample

The population of this research is all companies listed in Jakarta Stock Exchange in Index LQ-45 and has performed stock split from 2010 to 2016. This research uses sample in the period of 2010-2016 because in 2008 there is global financial crisis. It is assumed that 2 years after the crisis, IDX becomes normal again. This research uses purposive sampling to select the sample with the following criteria:

1. The date of stock split announcement and *cum-date* is provided.
2. The company does not perform other company actions except stock split on the *event window* around the announcement date.
3. The stock price data around the announcement can be acquired
4. The data of stock trading volume around the announcement date is provided

From the above criteria, there are 4 companies fulfilling all criteria, such as PT Telkom (TLKM), PT Kalbe Farma (KLBF), PT Astra Internasional Indonesia (ASII) dan PT Bank Rakyat Indonesia (BBRI).

This research use secondary data, as the lists of companies which perform stock split around the announcement date or *cum-date* from Harian Bisnis Indonesia (Indonesia Business Daily) and PT Kustodion Sentral Efek Indonesia (PT KSEI), while the daily stock price is acquired from Yahoo Finance.

B. Variable Operational Definition

To know the impact of right issue announcement on the stockholders' wealth, the following variables are used:

1. The date when *cum-date* is designated as period zero ($t=0$) in the window period, that is the final date of the stock trading with old nominal value.
2. 5 days after the event, that is 5 days after the period of $t=0$ (*cum-date*).
3. 5 days before the event, that is 5 days before the announcement date.
4. Stock return is the closing price on certain days, reduced by the previous day closing price, divided to the previous day closing price.
5. Abnormal return is the difference between the real return in the window period, reduced by the expected return (mean-adjusted model).

C. Statistical Analysis

In this research, the data analysis model uses *paired sample t-test* and *one sample t-test* to know the impact of stock split on stock price and stock trading volume and the existence of trade volume activity and abnormal return before and after the stock split.

IV RESULTS AND DISCUSSION

A. Variable Description

The main variables in this research are stock price and stock trading volume before and after the corporate action of stock split. The impact of stock split can be seen from the change of stock price and trading volume in the company. The indicator of change in stock price is from whether or not the abnormal return exists and the change in stock trading volume can be seen from whether or not the Trade Volume Activity (TVA) exists.

Abnormal return

Abnormal Return is surplus of return above or below the expected return. This research identifies it in window period (i.e. 5 days before the corporation action announcement and 5 days after *cum-date*). The data used to compute abnormal return is taken from Yahoo Finance (2016) and The Indonesian Stock Exchange (IDX-2016). The abnormal return of the sample companies is compiled in Table 1 and Figure 1.

Table 1: Abnormal Return around the Stock Split Announcement

No.	-5	-4	-3	-2	-1	0	1	2	3	4	5
BBRI	-0.016	-0.006	0.028	-0.025	-0.055	0.031	0.040	0.019	0.008	-0.021	-0.011
TLKM	-0.014	0.016	0.003	-0.052	-0.067	-0.053	0.063	0.034	-0.013	-0.024	0.022
KLBF	0.005	-0.001	0.005	0.092	-0.033	0.021	-0.011	0.010	0.020	-0.001	-0.011
ASII	-0.015	-0.012	-0.007	-0.003	-0.001	-0.015	0.057	0.053	-0.022	-0.022	-0.008

Source: analysed data

Based on the data acquired, the abnormal return of every sample changes in every period in the *window period*. This shows that the corporation action of stock split impact on the stock price.

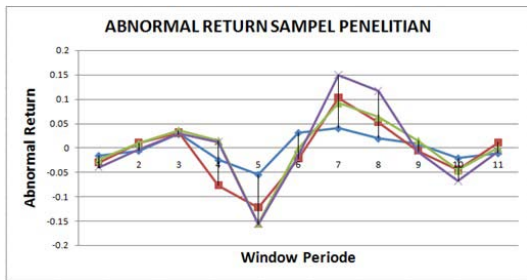


Figure 1: Visual Graphic of Abnormal Return

Trade Volume Activity (TVA)

Trade Volume Activity is a measurement to see the change in stock trading volume before and after the corporation action of stock split. The data used to compute TVA is taken from Yahoo Finance (2016) and The Indonesian Stock Exchange (IDX-2016). TVA of the sample companies is compiled in Table 2 and Figure 2.

Table 2: Trade Volume Activity (TVA) around the Stock Split Announcement

No.	-5	-4	-3	-2	-1	0	1	2	3	4	5
BBRI	0.001	0.002	0.002	0.002	0.005	0.002	0.001	0.001	0.001	0.001	0.001
TLKM	0.005	0.003	0.005	0.007	0.006	0.006	0.001	0.001	0.001	0.001	0.000
KLBF	0.004	0.004	0.005	0.007	0.011	0.005	0.001	0.001	0.001	0.001	0.001
ASII	0.008	0.008	0.011	0.012	0.013	0.011	0.001	0.001	0.001	0.000	0.001

Source: analysed data

Trade Volume Activity (TVA) of the sample in this research experience change in every period in the *window period* before $t=0$ which means that corporation action of stock split impact on the stock trade volume. Besides, TVA in the period after $t=0$ relatively stable.

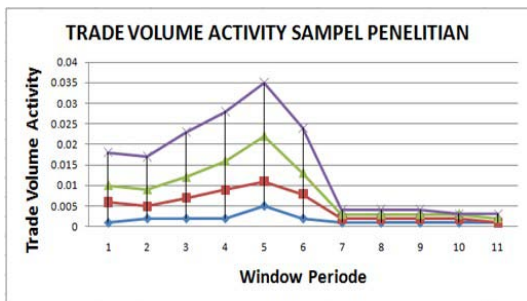


Figure 2: Visual Graphic of Trade Volume Activity (TVA)

B. The impact Stock Split on Stock Price

The impact of stock split on stock price can be seen from the existence of positive or negative abnormal

return in the *window period*. Based on the statistical analysis using one sample t-test to analyze the existence of abnormal return in the *window period*, the result is explained as Table 3.

Table 3: Statistical Result of One Sample T-Test

	N	Mean	Std. Deviation	Std. Error Mean
all	4	-.00209	.016101	.008051
aem	4	-.01704	.010934	.005467
ati	4	-.00153	.019187	.009594
adu	4	.02863	.018764	.009382
asa	4	.03735	.033771	.016885
c1	4	-.00425	.038025	.019012
bsa	4	-.03893	.029010	.014505
bdu	4	.00328	.062601	.031301
bti	4	.00707	.014775	.007388
bem	4	-.00068	.011834	.005917
bli	4	-.00999	.010112	.005056

Source: print-out SPSS

Empirically, Table 3 shows that there are both positive and negative abnormal returns in the window period. For example, on the *cum-date* there is a negative abnormal return 0,425%, and there is also a negative abnormal return 3,89% on one day before stock split announcement. Then finally, on one day after *cum-date* is there a positive abnormal return 3,74%.

Table 4: Testing Result One Sample T-Test

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
all	-.259	3	.812	-.002088	-.02771	.02353
aem	-3.116	3	.053	-.017038	-.03444	.00036
ati	-.159	3	.884	-.001527	-.03206	.02900
adu	3.051	3	.055	.028628	-.00123	.05849
asa	2.212	3	.114	.037350	-.01639	.09109
c1	-.224	3	.837	-.004252	-.06476	.05625
bsa	-2.684	3	.075	-.038932	-.08509	.00723
bdu	.105	3	.923	.003283	-.09633	.10289
bti	.957	3	.409	.007070	-.01644	.03058
bem	-.116	3	.915	-.000685	-.01952	.01815
bli	-1.976	3	.143	-.009993	-.02608	.00610

Source: print-out SPSS

Based on the testing result using one sample t-test as Table 4, it is known that there are abnormal returns both before the corporation action announcement and after the *cum-date* of corporation action. One day before the announcement, the stock price decreases, shown by the existence of negative abnormal return 3,89%, and the significance level $7,5\% < \alpha 10\%$. Then, two days after the *cum-date* the stock price increases, proven by the existence of positive abnormal return 2,86% with significance level $5,5\% < \alpha 10\%$. Four days after *cum-date*, the stock price also decreases, known from the existence of negative abnormal return 1,70% with significance level $5,3\% < \alpha 10\%$. Therefore, the statement that there is significant abnormal return in the window period is accepted.

Negative abnormal return found before the announcement indicates that the investors do not know about the corporation action, the investors' decision then is not to include the information about stock split. Their decision is predicted based on general information in the market, from fundamental and technical factors. The corporation action can be considered kept as secret before being announced to public. This is proven by the absence of the positive abnormal return before the period, yet the negative abnormal return exists, and this empiric result fit with Kurniawati (2013).

Different from the market reaction on corporation action (there is positive abnormal return), the stock price significantly increases after the stock split and the investors react positively. There are at least two reasons why stock split can increase the stock price. First, the investors interpret the performance of company which perform corporation action increases, or there is improvement potential of the company performance in the future. Companies with expensive stock price remain perform stock split because even though the performance is good, but the stock price cannot increase. The expensive stock price makes the investors reluctant to buy the stock, even though the company has better performance time to time. This possibly happens because Indonesia has many investors from low-to-middle level, hence to buy expensive stock they have to spend a big amount of money. Thus, the stock price of a company relatively stagnant and it needs to be improved, in this case, by performing stock split.

The second reason is because the cheaper stock price from the investors' perspective. By the implementation of stock split, the investors are initially unable to buy the stock then become able to buy it, so the numbers of investors who are interested in buying the stock get increased. According to the law of supply and demand, if the demand increases, the price will also increase. This is similar with companies performing corporation action, the demand will be predicted to increase which will trigger the improvement of stock price and significant positive abnormal return. Therefore, the hypothesis that stock split positively impact on stock price is accepted and finally also fit with the signaling hypothesis. This empiric result is consistent with Rabroty (2012), but contrary with Fama, Fisher, Jensen, and Roll (1969), Mishra (2006) and Pooja (2013).

C. The Impact Stock Split on Stock Trading Volume

The impact of stock split on stock trading volume can be seen from the existence or the absence of difference on Trade Volume Activity (TVA) before and after the corporation action of stock split. Based

on the statistical analysis using paired sample t-test, the result is compiled as follow:

Table 5: Statistical Result Paired Sample T-Test

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 After	.00086	25	.000310	.000062
Before	.00606	25	.003326	.000665

Source: print-out SPSS

Based on the result acquired, it can be interpreted that TVA after the corporation action is decreasing from 0,6% before the corporation action become 0,1% after the corporation action. This means that the number of stock traded after the corporation action is also decreasing. The next analysis is to know whether the decreased stock trading volume is significant or not.

Table 6: Testing Result Paired Sample T-Test

		Pair 1	
		After - Before	
Paired Differences	Mean	-.005204	
	Std. Deviation	.003444	
	Std. Error Mean	.000689	
	95% Confidence Interval of the Difference	Lower	-.006625
		Upper	-.003782
t		-7.554	
df		24	
Sig. (2-tailed)		.000	

Source: print-out SPSS

Based on Table 6, the difference of TVA before and after the corporation action is significant. This is proven by the result of paired sample t-test which shows that the significance level is 0,000 (lower from the significance level of 5%). Thus, the statement that there is significant difference of trading volume activity before and after the corporation action of stock split is accepted.

It is empirically proven that stock trading volume is significantly decreasing after the corporation action of stock split. There is some positive logical thinking from investors which strengthen the first empirical finding that the stock price increases after the corporation action. The investors believe that the company performing corporation action has better performance or at least potential of better performance. Thus, there are many purchasing activity after the action which also indicate the increasing demand that impact on the improvement of stock price. However, the trading activity decreases, so the TVA also decreases in accordance with the second finding. The decreasing trading activity as a result of investors who are reluctant to sell their stocks and aim to hold the stocks in longer period in order to gain more benefit or dividend because they believe that the company performance will get better.

This analysis is also an imperfect variable of TVA, where it only measures the number of trading volume which actually includes stock selling and buying.

Thus, if the TVA is decreasing (as happening in this research), it is unobvious whether the stock purchasing or buying is decreasing. The up and down of these two aspects bring substantial implication on the companies performing the action.

The other analysis why the trading volume activity decreases is the analysis period (the *window period*) which is too short (only 11 days; 5 days before and 5 days after the action). Therefore, many investors have done the purchasing activity and only some of them have done trading activity, so the overall trading volume activity decreases. Thus, stock split negatively impact on stock trading volume. After all this empiric results is contra with the result research before like as Chakraborty (2012), Fama, Fisher, Jensen, and Roll (1969), Mishra (2006) and Pooja (2013).

D. The Research Contribution to The Knowledge of Management

Koontz and Weihrich (1990) state that management is process of designing and maintaining environment where individuals are working together in groups, efficiently accomplishing selected aims.

The main aim of business organization is to maximize stockholders' wealth or increase the firm value. There are many ways to achieve that, one of them is by investment in long-term financial assets, for example to buy stock in the capital market. The result of this research can be used as reference or data base to make decision related to investment decisions.

V. CONCLUSION

The information about the corporation action of companies involved in LQ-45 does not leak to public before the announcement which empirically proves that there is no positive abnormal return before the announcement of corporation action of stock split. The stock price increases after the corporation action of stock split, which is empirically proven from the positive and significant abnormal return. The investors believe that the performance of companies which perform stock split is improving or at least the companies have potential to improve their performance. This makes them do trading activity, so the stock price increases. The Trading Volume Activity (TVA) after the corporation action significantly decreases because the purchasing activity increases while the period is too short to know about the trading activity (there are only a few of investors do trading activity). Thus, in order to get

comprehensive result, the *window period* needs to be longer (for example, 61 days) so the investors have longer period to do trading activity. This is meant to know further about the impact of corporation action. On the other side, as trading volume activity includes both purchasing and trading activities, the future research should specify on which activity is increasing or decreasing.

The research contribution for knowledge management is as reference or data base for managerial to make investment decision in long-term financial asset in the capital market.

REFERENCE

- Baker, Phillips & Powell (1995). Financial Practice and Education, The Stock Distribution Puzzle: A Synthesis Of The Literature, Spring/Summer.
- Bechmann and Raaballe (2007). *Journal of Business Finance & Accounting*, 34(3) & (4), 574–604, April/May 2007, 0306-686Xdoi: 10.1111/j.1468-5957.2007.02041.x, The Differences Between Stock Splits and Stock Dividends: Evidence on the Retained Earnings Hypothesis, USA.
- Chhavi iViehta, Surendra S. Yadav, and P.K. Jain (2011). Managerial Motives for Stock Splits; Survey Based Evidence from India. *Journal Of Applied Finance-No. 1*.
- Deborah A. Ford, Hoang H. Nguyen, and Van T. Nguyen (2012). Analyst coverage and market reaction around stock split announcements, *Applied Financial Economics*, 2012, 22, 135–145.
- Fama, Eugene F., Lawrence Fisher, Michael C. Jensen, and Richard Roll (1969). "The Adjustment of Stock Prices to New Information, *International Economic Review* 10:1 (February), 1-21.
- Hwang et al. (2012). *International Atlantic Economic Society*, Do Reverse Stock Splits Benefit Long-term Shareholders?, Springer, DOI 10.1007/s11294-012-9370-3.
- Jones Charles P. (2007). *Investments*, John Wiley & Sons(Asia) Pte. Ltd.
- Kurniawati, Indah. 2003. Analisis Kandungan Informasi Stock Split dan Likuiditas Saham: Studi Empiris pada Non-synchronous Trading. *Jurnal Riset Akuntansi Indonesia*. Vol. 6. No. 3. P. 264-275
- Lakonishok, Josef and Baruch Lev, 1987, "Stock Splits and Stock Dividends: Why, Who, and When," *Journal of Finance* 42:4(September), 913-932.
- Madhumita Chakraborty (2012). The Equity Market around the Ex-Split Date: Evidence from India *Vikalpa* Volume 37 • NO 1 • January – March.
- Mishra (2006). *International Journal of Theoretical and Applied Finance* Vol. 10, No. 2 (2007) 251–271c, World Scientific Publishing Company.
- Mayank, Joshipura (2009). *Indian Journal Of Finance*, Price and liquidity effects of stock split: An Empirical evidence from Indian stock market, Volume 3, Issue 10, October 2009.
- Nelson Maina Waweru and John Mwendwa (2012). Stock Splits And Their Effect On Share Prices: A Study Of Firms Listed On The Nairobi Stock Exchange (NSE), *Academy of Accounting and Financial Studies Journal*, Volume 16, Number 2.
- Pooja (2013). Stock Split Announcement and Liquidity Effect: Evidence from India, *Vilakshan, XIMB Journal Vol.10 (1) ; March*.
- Weihrich and Koontz (1990). *Essentials of Management*, Fifth Edition, McGraw-Hill Publishing Company, Singapore.
- Yan, Junbo (2012). *Journal of Applied Finance*, Stock Split Decisions: A Synthesis of Theory and Evidence, United States