

# CERTIFICATE OF PARTICIPATION

*this certifies that*

**Soetam Rizky**

has participated at

**The 2nd Indonesia International Conference on Innovation, Entrepreneurship, and Small Business (IICIES 2010)**  
Universitas Multimedia Nusantara, Serpong, July 13-15, 2010

as

**AUTHOR**

CIEL, SBM-ITB  
Conference Chair



**Dwi Larso, PhD**



**SBMITB**  
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Institut Teknologi Bandung



Proceedings of  
**THE 2ND  
INDONESIA  
INTERNATIONAL  
CONFERENCE ON  
INNOVATION,  
ENTREPRENEURSHIP, &  
SMALL BUSINESS**

**IICIES 2010**

July 11-15, 2010  
Serpong, Banten, Indonesia

**Developing Technopreneurship  
and Entrepreneurial Small Businesses:  
A Key to Sustainable Future**

**Editors**

Dohar Bob M. Situmorang, Dwi Larso

**Associate Editors**

Isti Raafaldini Mirzanti, Salfitrie R. Maryunani, Sonny Rustiadi, A. G. Eka Wenats,  
Andreas Budihardjo, Achmad Setyo Hadi

Organized by:



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**IICIES**

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## Preface

**Dear IICIES 2010 Participants,**

Welcome to the 2<sup>nd</sup> Annual Conference! Welcome to UMN! Welcome to Serpong, Indonesia!

The growth of small businesses through innovation and the growing number of entrepreneurs are critical in gaining prosperity of a society. Indonesia, with a very limited number of growing entrepreneurs and a very large number of not-growing small businesses, is in poor shape in shaping its prosperity. It must be stopped, it must be solved!

The 2<sup>nd</sup> Indonesia International Conference on Innovation, Entrepreneurship, and Small Business (IICIES 2010), initiated by the Center for Innovation, Entrepreneurship, and Leadership (CIEL), the School of Business and Management (SBM) at *Institut Teknologi Bandung* (ITB), is now collaboratively organized with *Universitas Multimedia Nusantara* (UMN). This event is intended to support the development of innovation, entrepreneurship, and small business for the better Indonesia. We challenge ourselves to learn, study, and create local knowledge with global mindset to provide some lights in the development of new entrepreneurs and small businesses. This Conference provides a venue for Indonesian scholars and a network with international experts to collaborate. Programs in the Conference include Sightseeings, Workshops, *Mengembang Layar* (a New Business Expo), Masters & Doctoral Consortium, Gala Dinner, Featured Speakers, and Parallel Sessions.

This 2<sup>nd</sup> IICIES has attracted more than 400 abstract submissions and about 130 reviewed and invited papers will be presented with the topics ranging from entrepreneurship theory to creativity and innovation, to entrepreneurship education, from social entrepreneurship to corporate entrepreneurship, from small business to family business, to growing business. Authors come from various institutions in Indonesia and from several other countries. At least 300 researchers and participants from many universities and several countries are attending to this Conference.

In this occasion, I am honored to thank all contributors to the Conference including all Authors and Reviewers, all Key Speakers and Program Facilitators, Participants and Prominent Guests, all Sponsors including Academic institutions, small-to-large Businesses, Governmental institutions, and Communities. I have been blessed to work with a dedicated Organizing Committee, combining UMN and CIEL staff members. Thank you. Thanks and appreciations are also due to Prof. Boediono, the Indonesian Vice President, Dr. Kuntoro Mangkusubroto, the Founder of ITB's SBM, Prof. Yohanes Surya, Rector of UMN, and Prof. Akhmaloka, Rector of ITB, for their full supports to this event.

*Tiada gading yang tak retak* (Nothing is absolutely perfect). We apologize for any inconveniences that may happen. I hope all of you will enjoy the Conference, look forward to hearing your sharing and seeing Indonesia in a better place: entrepreneurial and prosperous!

**Dwi Larso, PhD**

Conference Chair and Director of CIEL

## Outline

Section-1	Business Incubator and Cooperatives	1
Section-2	Business Plan and New Venture/Start-ups	33
Section-3	Corporate Entrepreneurship/Intrapreneurship and Entrepreneurial Corporate Culture	83
Section-4	Creative Industry and Creativity & Innovation	145
Section-5	Cultural Entrepreneurship and Social Entrepreneurship	253
Section-6	Emerging Technology, New Product Development, and Research & Development	297
Section-7	Entrepreneurial Finance and Micro-financing	355
Section-8	Entrepreneurial Leadership and Entrepreneurial Mindset/Traits/Characters	431
Section-9	Entrepreneurial Management	509
Section-10	Entrepreneurial Marketing	561
Section-11	Entrepreneurship Education and Entrepreneurship Theory	639
Section-12	Family Business and Woman Entrepreneurship	757
Section-13	Intellectual Capital/Property Rights	785
Section-14	Micro, Small, & Medium Enterprises	827
Section-15	Science & Technology Policy and Strategic Management of Technology	899
Section-16	Technological Competitiveness and Technology Commercialization	957
Section-17	Technology Development and Technology Management	985
Section-18	Technology Partnership and Technology Transfer	1049

## Table of Contents

### Section-1: Business Incubator and Cooperatives

- The Role of Business Incubators in Colleges to Minimize Business Failures among New Entrepreneurs during Start-Up 3  
*Tri Siwi Agustina; Departement of Management, Airlangga University, Indonesia*
- The Role of Indonesian Government and Global Crisis Effects on Islamic Cooperatives: the Case in Depok, West Java, Indonesia 13  
*Dodik Siswanto; Graduate Program in Accounting (PPIA-FEUI), University of Indonesia, Indonesia*
- Cooperative Bond as an Innovative Solution Alternative to Solve Cooperative Capital Scarcity in Indonesia 21  
*Ifan Noor Adham; Human Resources Development Board of Law and Human Rights Affairs, Ministry of Law and Human Rights Affairs of the Republic of Indonesia*
- The Use of Open Source Resources for a Cooperative Operational Management 27  
*Hadiyanto; Former Cooperative Chairman in a Workers Coop and a Linux Enthusiast*

### Section-2: Business Plan and New Venture/Start-ups

- Bendoro Tengkulak Game Scenario Design 35  
*Purba Daru Kusuma; Faculty of Electronics and Communication, Institut Teknologi Telkom, Indonesia*
- The Necessary Steps to Build an Internet Business 43  
*Indra Budi Trisno; Information Technology, Widya Kartika University, Indonesia*
- Juragan Bakmi Scenario Design as a Culinary Business Game 49  
*Purba Daru Kusuma; Faculty of Electronics and Communication, Institut Teknologi Telkom, Indonesia*
- Analysis on Children's Traffic Playschool as a Potential New Business in Indonesia 55  
*Samuel P. D. Anantadjaya<sup>1</sup>, Alan Juliano Yudha<sup>2</sup>; <sup>1</sup>School of Accounting, Faculty of Business Administration, Swiss German University, BSD City, Serpong, Tangerang Selatan, Indonesia; <sup>2</sup>School of Business, Faculty of Business Administration, Swiss German University, BSD City, Serpong, Tangerang Selatan, Indonesia*
- Business Plan for Micro, Small, and Medium Enterprises "How to Control Your Small Business after Your Business Plan Executed" 65  
*Hendra S. Raharjaputra; www.bizztalks.com*
- Engineering Capitalization: Building Independent Power Producer US\$ 60 Million without Any Equity, Getting 15% Share and Revenue US\$ 1.6 Million in Advance 69  
*Budi Kusmarwoto; PT. Prima Layanan Nasional Enjiniring, Indonesia*



Venture Creation: 3M Opportunity Identification Method in Action Case of Female Customer Oriented Business Shopping Mall, City of Bandung, West Java, Indonesia <i>Sonny Rustiadi, Dina Dellyana; Center for Innovation, Entrepreneurship, &amp; Leadership (CIEL), School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia</i>	77
 <b>Section-3: Corporate Entrepreneurship/Intrapreneurship and Entrepreneurial Corporate Culture</b>	
Corporate Social Responsibility Engagement among Small and Medium Enterprises <i>Sri Astuti Pratminingsih, Meriza Hendri; Widyatama University, Bandung, West Java, Indonesia</i>	85
Corporate Social Responsibility in Indonesia's Mass Media Industry <i>Ronny H. Mustamu; Department of Management, Faculty of Economics, Petra Christian University, Surabaya, Indonesia</i>	93
Corporate Entrepreneurship and Intrapreneurship as the Same Concept of Entrepreneurship within the Organizational Settings – A Worldwide Comparative Study to the Doctoral Thesis <i>Mariusz Soltanifar; University of Lodz, Faculty of Management, Poland (PhD Studies); University Malaysia Perlis, Malaysia (Visiting Lecturer); and Institute Technology Bandung, Indonesia (Guest Lecturer)</i>	103
The Influence of Corporate Culture on Organizational Commitment: Case Study of Civil Government Organizations in Indonesia <i>Astri Ghina<sup>1</sup>, Danny Permana<sup>2</sup>; <sup>1</sup>Student of Master of Science in Management, School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia; <sup>2</sup>Civil Government Employee at BPPT, Pemerintahan Kota Bandung, Indonesia</i>	113
Public Service Intrapreneurship in the Civil Government Organization <i>Astri Ghina, Ferry Dzulkifli Latief; School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia</i>	127
 <b>Section-4: Creative Industry and Creativity &amp; Innovation</b>	
Innovations in Restaurant Operation towards Improving Performance: A Case of Restaurants in Melaka <i>Filda Rahmiati, Md. Nor Hayati Tahir; Faculty of Technology Management and Technopreneurship, Universiti Teknikal Malaysia Melaka (UTeM), Malaysia</i>	147
Creative Industry Development Innovation Indonesia with “Village Regional Creative Industries” <i>Yenny Kornitasari; Student of Economics Faculty Brawijaya University</i>	157
Intelligence People Is Creative Person <i>Dwi Taufik Hidayat; Widya Kartika University, Informatics Engineering Dept., Surabaya, Indonesia</i>	167
Government's Hands on Art Craft: An Overview of Comparative Studies on	171

Indonesian and Japanese Government's Policies <i>Agus Zovhisto Sopian; Department of Japanese, Faculty of Language and Culture, Binus University, Jakarta, Indonesia</i>	
Performance Analysis of Wood Furniture Export of Yogyakarta Province <i>Ernoiz Antriyandarti; Agricultural Socioeconomics Department, Sebelas Maret University (UNS), Indonesia</i>	183
Service Innovation as Strategy to Beat Competitor in Business Services Setting (Case Study of a Small and Medium Industrial Company) <i>J. E. Sutanto, Jenny Rosita; Universitas Ciputra, Surabaya, Indonesia</i>	189
Service Innovations of a Local Hospital <i>Bambang Purwanggono, Yuliasih Lestari, and Nia Budi Puspitasari; Department of Industrial Engineering, Diponegoro University, Semarang, Indonesia</i>	197
The Effort to Increase Trust through Service Quality and Brand Image and Its Implication toward the Commitment of the Customers of Syariah Mandiri Bank Semarang <i>Ibnu Khajar<sup>1</sup>, B.T. Pitayaningsih<sup>2</sup>; <sup>1</sup>Economics Faculty Unissula Semarang, Indonesia; <sup>2</sup>Bank Mandiri Syariah Semarang, Indonesia</i>	209
Collaborative Value Creation in Service Innovation: An Application of Drama Theory <i>Yuanita Handayati, Togar M. Simatupang; School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia</i>	223
Balancing Firm and Product Level Capabilities: Exploring the Two Paths to Profit – Between Coherence and Diversity <i>Allya Paramita Koesoema; PhD Program in Management and Business Administration, Bocconi University, Milan, Italy; Biomedical Engineering Program; School of Electrical Engineering and Informatics, Institute of Technology Bandung, Indonesia</i>	233
Building Product Value toward Competitive Advantage (A Case Study of Tasikmalaya Embroidery) <i>Endang Sri Agustini, Astri Ghina; Students of Master of Science in Management, School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia</i>	241
<b>Section-5: Cultural Entrepreneurship and Social Entrepreneurship</b>	
Achieving Success through Cultural Entrepreneurship <i>Hendra Manurung; Communication and Public Relations at President University, Cikarang, Bekasi, Indonesia</i>	255
Sustaining Local Culture through Creative Industry <i>Meirina Triharini; Research Group Human &amp; Industrial Product, Industrial Design Section, Faculty of Arts and Design, Institute of Technology Bandung, Indonesia</i>	261
Branding a Culture; an Entrepreneurial Approach in the Age of Creative and Cultural Industries <i>Michael Nathaniel K.; Visual Communication Design Department, Universitas</i>	265

Ciputra, Indonesia

The Design of NITIKI Batik Participatory Game 275  
*Chandra Tresnadi<sup>1</sup>, Irfansyah<sup>2</sup>, Ary Setijadi Prihatmanto<sup>3</sup>; <sup>1,2</sup>Faculty of Visual Arts and Design (FSRD), Bandung Institute of Technology (ITB), Indonesia; <sup>3</sup>School of Electrical and Informatics Engineering (STEI), Bandung Institute of Technology (ITB), Indonesia*

Applying Role Model Method in Self-help Approach to Community Development in Indonesia 287  
*Anggara Wisesa; School of Business and Management (SBM), Bandung Institute of Technology (ITB), Indonesia*

### **Section-6: Emerging Technology, New Product Development, and Research & Development**

Attitude towards Counterfeit Products based on Consumers' Psychographic Characteristics: The Indonesian Evidence 299  
*Komang Tri Werthi and Ike Janita Dewi; Faculty of Economics, Sanata Dharma University, Yogyakarta, Indonesia*

SeLiTriX 4 in 1 309  
*Berthin Saragih, Otto Way Nursela, Ibnu Kautsar; Mechanical and Industrial Engineering, University of Gadjah Mada (UGM), Indonesia*

Functional Food Economic Opportunity: Patent Data Study, Market Trend, and Processing Technology Thereof 313  
*Diah Anggraeni Jatraningrum; Pusat Inovasi LIPI, Jakarta*

Virtual Integration as a Predictor for Product Innovation: A Preliminary Insight 319  
*Geraldly Dadriyansyah, Amlus Ibrahim; College Of Business (COB), Univesiti Utara Malaysia (UUM), Malaysia*

Innovation Mapping Status of R and D Results and Technology Development Opportunity in the field of Functional Food in LIPI 327  
*Rahmi Lestari Helmi; Center for Innovation, Indonesian Institute of Science, Jakarta, Indonesia*

A Study on Moral Aspects of Emerging Technology 337  
*Augustinus Setiawan, Vidi Arini Yulimar; STMIK PROVISI Semarang, Indonesia*

The Proposal of Internet Protocol Television (IPTV) PRODUCT Innovation at PT. Telekomunikasi Indonesia 345  
*A. A. Gde Mahardhika, Dwi Larso; School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia*

### **Section 7: Entrepreneurial Finance and Micro-financing**

Small Business Financing and Bank Performance: Empirical Study of Indonesian Publicly Banks 357  
*Mokhammad Anwar; Department of Management, Faculty of Economics, University of Padjadjaran, Indonesia*

Modern Barter Exchanges Could Help Entrepreneurs to Solve the Problem of Shortage Cash Flow and Excess Stock <i>Chandra Setiawan; PhD Candidate in Finance, Specialization in Islamic Finance at Graduate School of Management, Universiti Putra Malaysia, Malaysia</i>	367
Enterprise Risk Management for Small Businesses: Implementation of ISO 31000:2009 International Risk Management Standard <i>Deddy Jacobus; University of Gadjah Mada, Faculty of Economics and Business Student of MM-Program, Jakarta, Indonesia</i>	375
“Linkage Programming” Sharia Bank as Financing Alternative for Small and Medium Micro Enterprise <i>M. Primadion S., Nahdiyatul Ummah, Nina Hakim M.; Faculty of Economics, Airlangga University, Indonesia</i>	381
Determinants of Small Medium Industry’s Access to Formal Financial Institution Bank (Survey in Textile and Textile Product Small Medium Industry of Bandung Region) <i>Tasya Aspiranti; Bandung Islamic University, Indonesia</i>	393
Microfinance Organization in Rural Area: Case Study of Badan Kredit Desa <i>Irdam Ahmad; STEKPI School of Business and Management, Jakarta, Indonesia</i>	405
The Impact of Characteristics of Micro and Small Business Customers on Rural Credit Channeling in Sleman <i>Roberto Akyuwen<sup>1</sup>, Krisna Wijaya<sup>2</sup>; <sup>1</sup>Finance Education and Training Center Jogjakarta, Ministry of Finance Republic Indonesia; <sup>2</sup>PT. Bank Danamon (Persero), Tbk., Jakarta, Indonesia</i>	409
A Study of the National Economic Development Impact of Loan and Collateral Policy (KUR) for Small Business Owner/Manager with Different Cultural Background in Indonesia <i>Dhani Sulistiyono</i>	423
 <b>Section-8: Entrepreneurial Leadership and Entrepreneurial Mindset/Traits/Characters</b>	
Intrapreneurial Attitude and Its Correlation with Corporate Culture, Leadership Style, and Employees’ Achievement Motivation <i>P. M. Winarno; Universitas Multimedia Nusantara, Information Technology Department, Gading Serpong, Indonesia</i>	433
Modeling Motivation to Graduate Global Entrepreneur <i>Titi Ayem Lestari, Utara; Faculty of Economics, Gunadarma University, Indonesia</i>	443
The Entrepreneurial Heartset <i>Darmawan B. Suleiman<sup>1</sup>, Sri Eka Suandini<sup>2</sup>; <sup>1</sup>House of Alpha Mind-Mind Coaching Center, Jakarta, Indonesia; <sup>2</sup>Omnividya-Learning Boutique, Jakarta, Indonesia</i>	455
Challenges for Preparing Technical Leader in the Developing Technopreneurship & Entrepreneurial Small Businesses (Technical Sharing) <i>Parworo Sukendro; Technical Consultant for Technology-based Engineering</i>	469

*Projects, Bandung, Indonesia Simulation System Test Group, Directorate of Technology, IAe, Bandung, Indonesia*

Interpretations of the Entrepreneurial Resilience Index (A project funded by Malaysia Multimedia Super Corridor (MSC)) 475

*Nor Aishah Buang<sup>1</sup>, Noviarti<sup>2</sup>, Ismail Hj. Raduan<sup>3</sup>; <sup>1,2</sup>Universiti Kebangsaan Malaysia, Malaysia; <sup>3</sup>Institut Pendidikan Guru (Kuala Terengganu), Malaysia*

Dimensions for Measuring Technopreneurial/Entrepreneurial Resilience Index (A project funded by Malaysia Multimedia Super Corridor (MSC)) 481

*Nor Aishah Buang<sup>1</sup>, Noviarti<sup>2</sup>, Ismail Hj. Raduan<sup>3</sup>; <sup>1,2</sup>Universiti Kebangsaan Malaysia, Malaysia; <sup>3</sup>Institut Pendidikan Guru (Kuala Terengganu), Malaysia*

Islamic Entrepreneurial Character and Local Manner: The Javanese Cultural Entrepreneur 497

*Asfi Manzilati, Nurman S. Fadjar, Tyas Danarti H.; Economics Department, Brawijaya University (UB), Indonesia*

Entrepreneurs in Tourism Areas: Motivations, Problems, and Success Factors(A Case Study of Entrepreneurs in Pangandaran Tourism Area)

*Iin Mu'minah<sup>1</sup>, S. B. Hari Lubis<sup>2</sup>; <sup>1</sup>Department of Industrial Engineering, Widyatama University (Utama), Indonesia; <sup>2</sup>Department of Industrial Engineering, Institute of Technology Bandung (ITB), Indonesia*

## **Section-9: Entrepreneurial Management**

Value Creation Analysis on Indonesian Furniture Manufacturers: A Case Study of PT. Furniture Indonesia 511

*Samuel P. D. Anantadjaya<sup>1</sup>, Maika Nova Yudha<sup>2</sup>; <sup>1</sup>School of Accounting, Faculty of Business Administration, Swiss German University, Serpong, Tangerang, Indonesia; <sup>2</sup>School of Business, Faculty of Business Administration, Swiss German University, Serpong, Tangerang, Indonesia*

Household-level Entrepreneurship and Entrepreneurial Human Capital in Indonesia 525

*Russell Toth; Department of Economics, Cornell University, USA*

The Role of Sharia Banking Retailer and the Implication on Intermediary Efficiency: A Case Study on PT. Bank Muamalat Indonesia, Malang Office Branch 535

*Retno Dwi Arini, Asfi Manzilati, Nurman S. Fadjar; Economics Department, Brawijaya University (UB), Indonesia*

Enhance the Small Scale Agriculture Business by Organic SRI (System of Rice Intensification) 545

*Firsta Jusra Iskandar<sup>1</sup>, Hirmawan Eko Prabowo<sup>2</sup>; <sup>1</sup>Community Development Manager PT. Medco E&P Indonesia; <sup>2</sup>Community Development Analyst PT. Medco E&P Indonesia*

Management Audit in Small & Medium Enterprises: Balancing a Watchdog and a Strategic Partner Role 551

*Rudy Suryanto; Universitas Muhammadiyah Yogyakarta, Indonesia*

## **Section-10: Entrepreneurial Marketing**

- Mobile Marketing Potensial as Sales Alternative 563  
*Yulius Hari; Widya Kartika University, Surabaya, Indonesia*
- The Influence of Marketing Program of JIF's Brand to Face National and International Company toward Customer Loyalty 569  
*Meriza Hendri, Sari Dewi Oktari; Widyatama University, Bandung, Indonesia*
- Brand Performance: Independent vs Company-Owned Brand Community 577  
*Antonius Benipra Adinugraha, Amalia E. Maulana; Binus Business School, Jakarta, Indonesia*
- Analysis of the Factors that Influence Consumer Purchase Decisions in the Snack Product (Case study in BANCI as an Alternative Healthy Food) 589  
*Wati Susilawati<sup>1</sup>, Abdullah Ramdani<sup>2</sup>, Dini Turipanam Alamanda<sup>3</sup>, M. Okta Lesmana<sup>4</sup>; <sup>1,2,4</sup>Faculty of Economic, University of Garut, Indonesia; <sup>3</sup>School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia*
- Demographic Aspects: The Missing Source of Business Opportunities (A Case Study in Depok District Demography, West Java) 595  
*Aris Budi Setyawan<sup>1</sup>, Ichwan Suyudi<sup>2</sup>; <sup>1</sup>Faculty of Economics, Gunadarma University, Jakarta; <sup>2</sup>Faculty of Letters, Gunadarma University, Jakarta*
- The Effect of Price Discount and Word-of-Mouth toward Consumer's Purchase Intention and Willingness to Pay (Case Study on Crocs™) 603  
*Ivan Prasetya, Mustika Sufiati Purwanegara; School of Business and Management (SBM), Bandung Institute of Technology (ITB), Indonesia*
- Case Study of Rattan Industry Revival in Indonesia 613  
*Gilang Ayunda, Harimukti Wandebori; School of Business and Management (SBM), Institute Technology of Bandung (ITB), Indonesia*
- Telkom Speedy Brand Performance Assessment by Using Brand Building Model Approach: A Survey in Bandung 623  
*Sri Anindianti, Harimukti Wandebori; School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia*
- A Study of New Prescribed Medical Product Acceptance: Case of Bandung and Surabaya, Indonesia 635  
*Reza A. Nasution, Sonny Rustiadi, Dina Dellyana; School of Business & Management (SBM), Institute of Technology Bandung (ITB), Indonesia*

## **Section-11: Entrepreneurship Education and Entrepreneurship Theory**

- Performance of SMEs: The Joint Effect of Market Orientation, Entrepreneurial Orientation, and Customer Interaction Orientation 641  
*W. M. Nazdrol W. M. Nasir<sup>1</sup>, John Breen<sup>2</sup>, Alexander Josiassen<sup>3</sup>; <sup>1,2</sup>School of Accounting, Victoria University, Australia; <sup>3</sup>School of Hospitality, Tourism & Marketing, Victoria University, Australia*
- Entrepreneurship Education Is a Must 647  
*Wiwin Purnomowati, Iwan Nugroho; Widyagama University, Malang, Indonesia*

The Entrepreneurship Researches in Indonesian Conference on Innovation, Entrepreneurship, and Small Business ITB <i>Yanto Sidik Pratiknyo; PPM Management School, Jakarta, Indonesia; International CEFE Association for Entrepreneurship, Frankfurt, Germany</i>	659
High Technology Entrepreneurship <i>Wiwiek Sri Suhartati<sup>1</sup>, Yanto Sidik Pratiknyo<sup>2</sup>; <sup>1,2</sup>PPM-Manajemen, Jakarta, Indonesia; <sup>2</sup>International CEFE Association for Entrepreneurship, Frankfurt, Germany</i>	669
Comparing Poverty without Poverty Lines and Poverty Indices <i>Muhammad Nashihin; STIE Keuangan dan Perbankan Indonesia (STEKPI) Jakarta, Indonesia</i>	683
Entrepreneurship and Resilience: A Development of Resilience Potential Measurement <i>Ika Widayarni, Ari Pratiwi; Psychology Department, Faculty of Social and Political Sciences, Brawijaya University, Indonesia</i>	691
The Influence of Entrepreneurial Curriculum, Lecturer, and Extra Curriculum Programs toward Students of Business and Management Faculty of Widyatama University Intention to Be an Entrepreneur <i>Tendi Haruman<sup>1</sup>, Meriza Hendri<sup>2</sup>; <sup>1</sup>Professional Faculty, Bakrie University, Jakarta, Indonesia; <sup>2</sup>Widyatama University, Bandung, Indonesia</i>	697
Opportunities for Cross Boarder Entrepreneurship Education in ASEAN Region <i>Abdul Aziz Ab. Latif, Ghazali Ahmad; Faculty of Business and Entrepreneurship, Universiti Malaysia Kelantan, Malaysia</i>	705
Strengthening Solution of Entrepreneurship Education in Indonesia <i>M. Quadrat Nugraha; FISIP, Muhammadiyah University, Indonesia</i>	709
A Framework of Measuring Entrepreneurship in Indonesia <i>Ferry Dzulkifli Latief; School of Business and Management (SBM), Bandung Institute of Technology (ITB), Indonesia</i>	719
Free of Charge Education but Profitable, Is It Possible? <i>Wendie Razif Soetikno; Yayasan Keluarga Bunda, Bekasi, Indonesia</i>	727
Service Innovations of a Local Hospital <i>Bambang Purwanggono, Yuliasih Lestari, and Nia Budi Puspitasari; Department of Industrial Engineering, Diponegoro University, Semarang, Indonesia</i>	731
Readiness toward Entrepreneurship University: A Case Study in Brawijaya University <i>Didied P. Affandy, Nurman S. Fadjar; The Faculty of Economics, Brawijaya University (UB), Indonesia</i>	743
 <b>Section-12: Family Business and Woman Entrepreneurship</b>	
The Determinant of Investment Choices for Womanpreneur: Literature Review <i>Sylviana Maya Damayanti; School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia</i>	759

Drawbacks of Women Entrepreneurship in Indonesia <i>Dorothy Ferary; Yayasan PRIMA Education Indonesia</i>	765
Family Members & Family Business Activities: A Psychological Contract? <i>Samuel P. D. Anantadjaya<sup>1</sup>, B. Agus Finardi<sup>2</sup>, and Irma M. Nawangwulan<sup>3</sup>;</i> <i><sup>1</sup>School of Accounting, Faculty of Business Administration, Swiss German University, EduTown, BSD City, Serpong, Tangerang Selatan, Indonesia; <sup>2</sup>School of Business, Faculty of Business Administration, Swiss German University, EduTown, BSD City, Serpong, Tangerang Selatan, Indonesia; <sup>3</sup>English Tutorial Center, Bandung, Indonesia</i>	773
<b>Section-13: Intellectual Capital/Property Rights</b>	
Framework in Calculating the Economic Contribution of the Copyright-based Industries in Indonesia using WIPO Methodology*) <i>Ike Janita Dewi; Faculty of Economics, Sanata Dharma University Yogyakarta</i>	787
Web Copywriting: Persuasive Writing Techniques in Internet Marketing <i>Alvii T. B. Siregar; English Dept., Widyatama University, Indonesia</i>	797
The Utilization of Intellectual Property Rights (IPR) of Plant Variety through Partnership to Improve Small Micro Agribusiness Competitiveness in Strengthening the National Economy <i>Nina Nurani; Bussiness and Management Faculty, Widyatama University, Indonesia</i>	803
Prevention of Hijacking and Dissemination of Intellectual Property Right (IPR) <i>Bambang Pratama; Lecturer Faculty of Economy and Business (FEB), Bina Nusantara University, Indonesia</i>	823
<b>Section-14: Micro, Small, &amp; Medium Enterprises</b>	
Measuring Success Factors of Products of Micro, Small, and Medium Enterprise Using AHP Approach <i>Dwi Kartikasari; Politeknik Batam, Parkway Street, Batam Centre, Batam, Indonesia</i>	829
Social Networking 2.0 Unleashed: Small Businesses in a World without Boundaries <i>Yenni M. Djajalaksana<sup>1</sup>, Francisca H. Chandra<sup>2</sup>; <sup>1</sup>University of South Florida, Tampa, FL, USA; <sup>2</sup>Sekolah Tinggi Teknik Surabaya (STTS), Surabaya, Indonesia</i>	839
Malaysian Rural Hospitality SMEs: Financing and Marketing Practices <i>Ruziah A. Latif, Norlina Md. Ali, Zaibedah Zaharum; Faculty of Business Management, Universiti Teknologi MARA, Malaysia</i>	847
A Study on SME Innovation Impediments <i>Robby Rosandi; BAPPEDA Kota Sawahlunto, Research and Development Department, Indonesia; Padang School of Economics and Commerce (STIE Perdagangan-Padang), Indonesia</i>	855
The Estimation of Labour and Capital Utilization in Micro-Small Enterprises in Indonesia	865



*Rahmat; Center for Economics and Development Studies (CEDS) Faculty of Economics, Padjadjaran University, Indonesia*

The Impact of Micro Credit on MSME (Micro, Small, and Medium Enterprise) Optimization to Support the Economic Growth 873  
*Janita S. Meliala; Faculty of Business & Management, Widyatama University, Bandung, Indonesia*

Cooperative Decision on a Small Business Product Development 879  
*Christiono Utomo; Magister Manajemen Teknologi, Institut Teknologi Sepuluh Nopember (ITS), Indonesia*

The Success Factors of Food Small Medium Entrepreneurs under the One District One Industry Programme: A Case on Food Manufacturing Entrepreneurs in Melaka 887  
*Othman Aman, Filda Rahmiati; Faculty of Technology Management and Technopreneurship, Universiti Teknikal Malaysia Melaka, Malaysia*

### **Section-15: Science & Technology Policy and Strategic Management of Technology**

Labeling on Small Medium Enterprise Products: Regulation and Practice 901  
*Rasyid Adhi Zosmana*

The Sources of Information of the Government Sponsored Business Assistances among Micro-sized Entrepreneurs in Kelantan, Malaysia 909  
*Mohd. Nor Hakim Yusoff, Mohamed Dahlan Ibrahim, Mohd. Rafi Yaacob; University Malaysia Kelantan, Malaysia*

Maritime Industry Development in Indonesia: Business Risk and Opportunity 921  
*Sylviana Maya Damayanti; School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia*

Promoting Adaptability for Implementation of Information and Communication Technology in Higher Learning: A Contingency Theory Approach 929  
*Rosiwarna Anwar; Department of Business and Management, University of Indonesia, Indonesia*

Modeling Service Oriented Computing for Green IT Governance in G-Readiness Framework 937  
*Soetam Rizky Wicaksono; Information System Study Program, Ma Chung University, Indonesia*

Analysis of Manufacturing Strategy Process and Business Performance at Manufacturing Industry in Indonesia 941  
*Triyanto; Education on Duty, Pekalongan Regency, Central Java, Indonesia*

### **Section-16: Technological Competitiveness and Technology Commercialization**

Cost Reductive Analytics 959  
*Santosa Widjaja, Edy Wijaya; UprightDecision, Jakarta, Indonesia*

Lessons Learned: Encouraging Product Competitiveness through In-class Projects <i>Taufik; Electrical Engineering Department, Cal Poly State University, San Luis Obispo, California, USA</i>	965
Electricity Supply in Rural Areas from Industrial Wastewater through Renewable Energy <i>Johannes Johansyah Salim</i>	971
Technology Transfer System for Higher Education Institutions and Industry (Case Study: Small Businesses in creative industry) <i>Isti Raafaldini Mirzanti<sup>1</sup>, Dona Saphiranti<sup>2</sup>, Salfitrie Roos Maryunani<sup>3</sup>, Dwi Larso<sup>4</sup>; <sup>1,3,4</sup>School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia; <sup>2</sup>Faculty of Art and Design, Institute of Technology Bandung (ITB), Bandung, Indonesia</i>	981
<b>Section-17: Technology Development and Technology Management</b>	
Explaining Knowledge Creation Using Structuration Theory <i>Ikbal Maulana; Center for Science and Technology Development Studies (PAPPIPTEK)-LIPI, Indonesia</i>	987
Analysis of Utilization of Hydram Pump's Water Source for Catfish Culture and Paddy Cultivation: (Case Study at Jingkang Village Subdistrict of Tanjung Kerta-District of Sumedang) <i>R. Ismu Tribowo; Center of Appropriate Technology Development-Indonesian Institute of Sciences, Subang, Indonesia</i>	997
Benefit of Information Technology in the Criminal Trial System Workings Observation in Central Java <i>Agus Raharjo<sup>1</sup>, Nurul Hidayat<sup>2</sup>, and Sunaryo<sup>3</sup>; <sup>1,3</sup>Faculty of Law, Jenderal Soedirman University (UNSOED), Indonesia; <sup>2</sup>Study Program Information Engineering, Faculty of Sains and Engineering, Jenderal Soedirman University (UNSOED), Indonesia</i>	1005
CEGCS: Chicken Egg Grade Classification System using Computer Algorithm <i>Tasiransurini Ab. Rahman, Tee Jia Jinq, Marlia Morsin, Muhammad Suhaimi Sulong; Faculty of Electrical &amp; Electronic Engineering (FKEE), Universiti Tun Hussein Onn (UTHM), Malaysia</i>	1017
The Designing Web Based Media "Active, Creative, Innovative, and Fun" Learning Process <i>Widyo Nugroho, M. S. Harlina, Irsya Indiwara; Gunadarma University, Indonesia</i>	1023
The Designing of Computer-Based Information and Communication Media for Improving the Performance of Hajj and Umroh Travel Agents <i>Widyo Nugroho, Ruzi Erlinda, Irsya Indiwara; Gunadarma University, Depok, Indonesia</i>	1031
Validation of Dimensions in the Factors of Usability, Interactivity, and Trust as the Indicators of Web Experience in Online Marketing <i>Luhur Budiansyah; Alumnus of Graduate School of Communication Science, University of Indonesia (UI); Marketing Strategist, PT. Anta Express Tour &amp; Travel Service Tbk. and its subsidiary PT. Vayatour, Indonesia</i>	1037

Perceived Usefulness and Buying Intention in Kaskus <i>Fransisca Budyanto Widjaja, Ivan Prasetya; School of Business and Management (SBM), Institute of Technology Bandung (ITB), Indonesia</i>	1043
Increasing Competitiveness of Ceramic Products through Improved Product Design and Furnace Efficiency (Case Study: 2 SMEs in Bandung) <i>Dona Saphiranti; Faculty of Art and Design, Institute of Technology Bandung (ITB), Indonesia</i>	
<b>Section-18: Technology Partnership and Technology Transfer</b>	
New Balanced Concept: An Innovative Approach in SME Development through Knowledge Transfer System in Indonesia <i>Syafrizal Maludin; Center for Innovation, Indonesian Institute of Sciences (LIPI), Indonesia</i>	1051
Interaction Patterns in Supporting Innovation: The Case of Manufacturing Industry <i>Nani G. Simamora, Irene M. Nadhiroh; Center for Science and Technology Development Studies, the Indonesian Institute of Science</i>	1059
How Can We Accelerate Industry-University Collaboration Effectively by Using Know-How License? <i>Daisuke Kanda; Senior Visiting Researcher, Keio Research Institute at SFC, Japan</i>	1069
In Search of Effective Innovation Intermediation Practices <i>Dimas Sandy Yuditya; Business Innovation Center, Jakarta, Indonesia; Oxford Brookes University, Nilai International University College, Malaysia</i>	1073

# Modeling Service Oriented Computing for Green IT Governance in G-Readiness Framework

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## *Abstract*

*Green IT implementation in Indonesia nowadays is just another dream for many companies. However, if top level management can be ensured that having Green IT implementation is not just helping mother earth to breathe longer, but also giving more efficiency, than top level management will support it. One of the way to ensure them is by modeling a model that can be implemented easily. This paper propose Service Oriented Computing (SOC) model to make lower energy consumption and better performance. Thus, it will help to give better awareness of Greent IT implemenation for top level management. This kind decision from top level management should be included in IT governance and should become the startup step for having Green IT implementation for the company. Green IT implementation in company commonly measured by a framework of G-Readiness, therefore the SOC model is supposed to be one small step in Green IT governance toward the framework*

*Keywords: service oriented computing, green IT, G-Readiness, IT Governance*

## **1. Introduction**

The need of fulfilling green movement has already incorporated many parts of everyday life including IT aspect. However, people still believe that green movement in IT aspect has only become an utopia nowadays (Chow and Chen, 2009). It just because paradox point of view that still see IT as big energy consumer and hardly reduced it.

The past decade has seen many businesses realize the long term effects of pollution and taking responsibility for their actions through social and environmental responsibility initiatives in ways that improve their environmental footprint. As IT plays an integral role in almost all facets of businesses, and as each stage of the IT lifecycle from manufacturing to usage and disposal can pose environmental damages it naturally follows that demands for CSR and “environmental sustainability” should be extended to IT too (Molla et al, 2009; Educause, 2010).

Estimates indicate that ICTs account for 2% of global CO<sub>2</sub> emissions, which is equivalent to the amount generated by the aviation industry (Poniatowski, 2010). On the other hand, empirical research in US only has stated that nearly 82 billion lbs of CO<sub>2</sub> equivalent are released as a result of the electricity used by U.S. servers and data centers annually (Molla et al, 2008). Thus, the importance of Green IT implementation should become a key point for any IT managers in order to make Mother Earth breathe happier

On the other hand, western part of the world has already paid attention of this subject. One of proofs is the statement of G-Readiness Framework that become a semi formal measurement of a company or institution in implementing green movement of IT (Molla et al, 2008). Though G-Readiness Framework still being questioned in its implementation, the framework itself has become one of IT management attitude measurement in Australia and Oceania (Molla et al, 2009; Connection Research, 2009).

In Indonesia, there is no valid proof which can be mentioned clearly that any corporate or institution already be concerned with G-Readiness. While many IT managements still struggle with their person behavior and also their infrastructure efficiency, actually there is some features from G-Readiness Framework that can be set up immediately to help Mother Earth live longer.

One of its simple implementation is using Service Oriented Computing (SOC) that can help lower power consumption as well as infrastructure efficiency. Service Oriented Computing that can handle disconnected data concept also can give better performance for data server. Thus, its implementation should really help any corporate to start preparing themselves in fulfilling G-Readiness Index.

However, before implementing the proper SOC to support green movement of IT, there should be a model of SOC that can go with Indonesian IT condition. Therefore, this paper

tries to model a proper SOC in order to prepare for G-Readiness as well as great efficiency in common IT implementation in Indonesia.

## 2. Literature Review

### 2.1 Service Oriented Computing

A service is the product of human, organizational, or computational activity meant to satisfy a need, but not constituting an item. Service Oriented Computing itself provides the tools to model the information and relate the models, construct processes over the systems, assert and guarantee transactional properties, add in flexible decision-support, and relate the functioning of the component software systems to the organizations that they represent goods (Singh and Huhns, 2005).

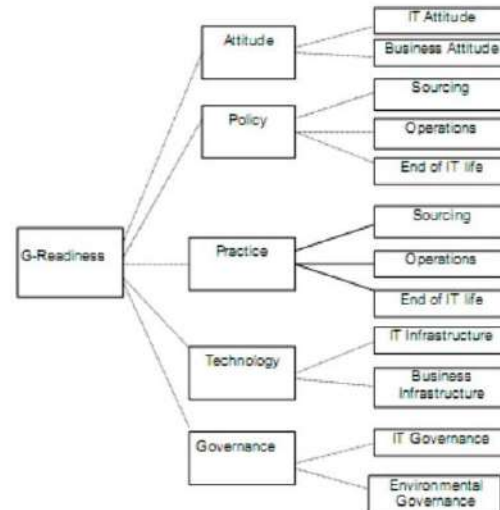
SOC usually also related with SOA (Service Oriented Architecture) which enabling framework for integrating business processes and supporting information technology infrastructure as loosely coupled and secure, standardized components — services — that can be reused and combined to address changing business priorities (Lawler and Howell-Barber, 2008). Thus, core keyword from SOC in an information system implementation is flexibility (Singh and Huhns, 2005).

### 2.2 G-Readiness

G-Readiness is an organization's capability as demonstrated through the combination of attitude, policy, practice, technology and governance in applying environmental criteria to its IT technical infrastructure as well as within its IT human infrastructure and management across the key areas of IT sourcing, operations and disposal to solve both IT and non-IT (by using IT) related sustainability problems. (Molla et al, 2009). On the other hand, an independent institution from Australia called Connection Research also developed Green IT Readiness Index (GrITx) that comes from term of G-Readiness (Connection Research, 2009).

G-Readiness itself consists of five major components which are (Molla et al, 2008):

- a. Green IT Attitude
- b. Green IT Policy
- c. Green IT Practice
- d. Green IT Technology
- e. Green IT Governance



Source: Molla (2008).

Figure 1. G-Readiness Framework

Focus in this research is Green IT Governance that leads to the operating model that defines the administration of Green IT initiatives. Should a business assign the responsibility for Green IT initiatives to CIO's, or should it come under environmental managers? Should IT organisations be held responsible for electricity costs and accountable for energy efficiency? Answers to these and similar questions define the governance dimension of Green IT (Molla et al, 2008).

Green IT Governance also includes strategic foresight from IT manager to make an information system become more efficient and support eco-sustainability (Molla et al, 2009). This strategic foresight should guide the software development process into a proper model for keeping earth less suffer.

Thus, what is the meaning of IT Governance ? IT Governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of leadership and organisational structures and processes that ensure that the organisation's IT sustains and extends the organization's strategies and objectives (Lee, 2008).

## 3. Model Prototyping

When a question shown up about reason of choosing SOC as one of startup step in Green IT Governance, then it should be answered using two words : flexibility and efficiency. SOC that theoretically and practically can handle cross platform and also cross language development

will create easiness for any developer team to build virtualization in their software development process. While SOC also can make data server become more idle (that means using less power) since that some of processes will be handled by desktop rather than taking whole process in server.

The main problem in implementing SOC for many software developers in Indonesia is merely based on lack of knowledge about SOC itself. However, most of them actually can implement it simply by knowing the right model for SOC. Thus, as stated before that eventhough many IT managers assume that Green IT implementation is only a utopia, in fact they really need it and in contrary they actually can implement it easily.

Many SOC model that comes with virtualization concept stated that it will need many data servers which are spread up into many places (Singh and Huhns, 2005). This assumption will not suitable against the real condition in Indonesia since that many small-medium enterprises (SME) typically only have one or two servers in their rack. Thus, there should be another model that can represent the “real condition” in Indonesia that can implement SOC.

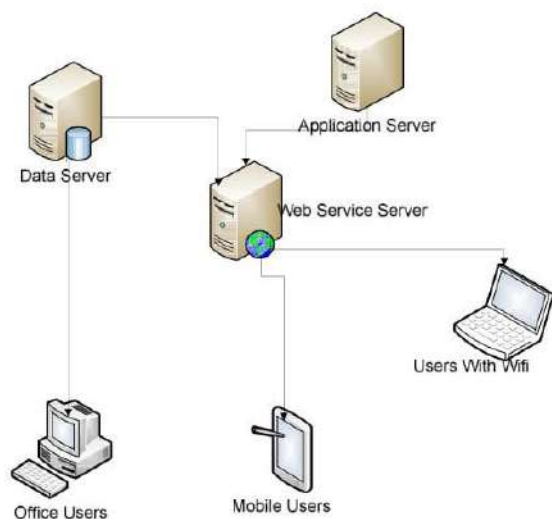


Figure 2. Model Architecture

Core implementation of SOC is the usage of Web Service in an information system. However, the model that presented in figure 2 is different with “ordinary” SOC model. Commonly, SOC will put a Web Service server inside the company and will act as permanent bridge to connect all type of users. Thus, it will

make SOC implementation need more servers as well as more energy consumption.

In proposed model, Web Service Server actually hosted outside the company as another dedicated web-hosting server. This little trick should have greater efficiency toward green IT concept. On the other hand, this concept stills a wishful thinking for many IT departments in Indonesia. Since that many IT managers still hesitate about the security of web hosting server and many of them also doubtful that dedicated web hosting server will give them efficiency rather that administering own server.

In proposed model, Web Service Server will lightening data and application server load. This could happen because of users that come from outside office, especially that access application beyond office hour, will redirect to web service server. Thus, using disconnected concept in its application, servers that located in office can work in power-saving mode while its not in busy office hour. This condition should have great efficiency in energy consumption and also reducing risk that can happen whenever there is no administrator outside office hour.

Despite of all the hesitation, the decision of implementing this concept need great commitment. The commitment does not come from the IT manager, however, the commitment should come from top level of management that must concern about how mother earth suffer from greater energy consumption. That is the main reason why this model should be considered as IT Governance in preparing a company to have better G-Readiness.

Because most of company in Indonesian still ignoring the importance of Green IT, it is still a dream to have “real” Green IT infrastructure. However, when presenting this model and ensuring top level management that Green IT implementation is not just important for mother earth, but also for company, at least it can change the paradigm from top level management and also change the policy of IT governance in the company

#### 4. Conclusion

- a. While many countries already start to have G-Readiness measurement in company that using IT as its core supporting business, Indonesian government perhaps never know about this measurement.
- b. In order to start to implement G-Readiness framework in Indonesia, it should start from top level management, thus it must be

- initiated from IT governance rather than IT attitude. Since that the awareness of Green IT implementation in Indonesia is very low, thus it need “real power” to make it happen.
- c. One of the way to ensure top level management in Green IT efficiency is through SOC modeling that can give efficiency as well as lower energy consumption.
  - d. The proposed model is just the beginning and should be more detail for each company, however, it should become a great beginning in raising awareness of Green IT importance in real life.

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