PROCEEDING

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9TH ISIEM

9th INTERNATIONAL SEMINAR ON INDUSTRIAL ENGINEERING & MANAGEMENT

"COLLABORATIVE INNOVATION TOWARDS BORDERLESS INDUSTRIAL AND ECONOMIC SYSTEM"

GRAND INNA MUARA
HOTEL CONVENTION & EXHIBITION

PADANG, WEST SUMATERA, INDONESIA
TUESDAY-THURSDAY, SEPTEMBER 20-22, 2016

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PROCEEDING

9th ISIEM

The 9th International Seminar on Industrial Engineering and Management

Grand Inna Muara Hotel Convention & Exhibition Padang,
West Sumatera, Indonesia, September 20 – 22, 2016

Organized by :

Industrial Engineering Department of

• Trisakti University • Al Azhar Indonesia University •
• Esa Unggul University • Telkom University •
• Tarumanagara University • Pasundan University •
• Atma Jaya Catholic University of Indonesia •
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PREFACE

Dear Presenters and Delegates,

On behalf of the Organizing Committee, I am honored to welcome you to the 9th International Seminar on Industrial Engineering and Management (ISIEM). This seminar is organized by the Industrial Engineering Department from eight Universities, namely Trisakti University, Telkom University, Tarumanagara University, Atma Jaya Catholic University of Indonesia, Al Azhar Indonesia University, Esa Unggul University, Pasundan University, and Bung Hatta University.

The theme **"Collaborative Innovation Towards Borderless Industrial and Economic System"** which in accordance with the current economic era, we hope that through the exchange of ideas, experiences and recent progress in Industrial Engineering and Management from academicians, engineers, professionals and practitioners from Universities, research institutions, government agencies and industries be able to help us to deal with future challenges.

We hope that our presenter and delegates will gain many shared ideas and great experiences from this conference and also acquire additional insights from our honorable speakers, **Gursel Ilipinar, PhD** from ESADE Business School – Barcelona, **Profesor Emeritus Dato' Ir. Dr. Zainai Bin Mohamed** from UTM Razak School of Engineering and Advance Technology – Malaysia, **Milko-Pierre Papazoff** from Vice President of French External Trade Counsellor (Malaysian Chapter).

The success of this seminar is due to the hard efforts of many people who we gratefully acknowledge. Special thank to all reviewers, speakers, and presenters, also highly appreciate to the committee for mutual effort and invaluable contribution.

Finally, we hope you will enjoy this conference and the natural beauty of Padang city – Indonesia and see you in the next ISIEM.

Best wishes,

Chair of the 9th ISIEM 2016

Dr. Wisnu Sakti Dewobroto, M.Sc

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17. Inna Kholidasari, S.T., M.T., Ph.D. (Bung Hatta University)
18. Ayu Bidiawati J.R, S.T.,M.T. (Bung Hatta University)

KEYNOTE SPEECH

#1
Prof. Emeritus Dato' Ir. Dr. Zainai Bin Mohamed
UTM Razak School of Engineering and Advanced Technology
UTM International Campus

#2
Gursel Ilipinar, PhD
Innovation Management Expert
ESADE Business School - Barcelona

#3
Milko-Pierre Papazoff
VP of French External Trade Counsellor (Malaysian Chapter)

AGENDA

September 20, 2016

18:00 - 18:30	Registration
18:30 - 19:30	Dinner
19:30 - 19:40	Padang Dance by Bung Hatta University
19:40 - 19:45	Welcoming Speech from Head of Committee ISIEM 9th
19:45 - 20:00	Opening Ceremony by Bung Hatta University Rector
20:00 - 21:00	Keynote Speech # 1 **Prof. Emeritus Dato' Ir. Dr. Zainai Bin Mohamed** **(UTM Razak School of Engineering and Advanced Technology,** **UTM International Campus – Malaysia)** **Moderator:** Dr. Adianto, M.Sc.
21:00 - 21:15	Photo Session with all participants

September 21, 2016

6:30 - 8:00	Breakfast and Registration
8:00 - 9:00	Keynote Speech # 2 **Gursel Ilipinar, PhD** **(Innovation Management Expert** **ESADE Business School – Barcelona)** **Moderator:** Ir. Wahyukaton, M.T.
9:00 - 10:00	Keynote Speech # 3 **Milko-Pierre Papazoff** **VP of French External Trade Counsellor (Malaysian Chapter)** **Moderator:** Dr. Ir. Syarif Hidayat, M.Eng.Sc, M.M.
10:00 - 10:30	Question and Answer
10:30 - 11:15	Coffee and Tea Break
11:15 - 12:35	Parallel session #1
12:35 - 13:30	Lunch break
13:30 - 16:30	Parallel session #2
15:00 - 15:15	Coffee and Tea Break
18:30 - 20:00	Dinner

September 22, 2016

08:00	- 09:30	Parallel session #3
09:30	- 17:00	City Tour

PARALLEL SESSION

SEPTEMBER 21, 2016 SESSION 1 ROOM 1
Moderator : Dr. Lamto Widodo, S.T., M.T.

Time	Paper	Code	Paper Code
11.15-11.25	**MAINTENANCE PERFORMANCE MEASUREMENT TRANSJAKARTA BUS AT PERUM DAMRI SBU BUSWAY CORRIDOR I & VIII USING MAINTENANCE SCORECARD** Didien Suhardini, Iveline Anne Marie, Amal Witonohadi, Auliandi Fahriditya Putra Jurusan Teknik Industri, Fakultas Teknologi Industri, Universitas Trisakti, Jakarta, Indonesia	IM	110
11.25-11.35	**IDENTIFICATION OF SUPPLY CHAIN PERFORMANCE INDICATORS AND STRATEGIC OBJECTIVES USING THE BALANCED SCORECARD** Dwi Kurniawan, Adela Anggun Pertiwi, Lisye Fitria Industrial Engineering Department, Institut Teknologi Nasional, Bandung, Indonesia	SCM	26
11.35-11.45	**IMPROVEMENT TO QUALITY OF TELECOMMUNICATION SERVICE BY MINIMIZE FAILURE OF SIMKARI APPLICATION DEVICE (A CASE STUDY IN PT DATALINK SOLUTION)** M. Hudori Department of Logistic Management, Citra Widya Edukasi Polytechnic of Palm Oil, Bekasi, Indonesia	QM	79
11.45-11.55	**POSITIONING ANALYSIS FOR HIGHER EDUCATION BASED ON PERCEPTUAL MAPPING USING MULTIDIMENSIONAL SCALING** Hafizh Suharja, Yati Rohayati, Rio Aurachman School of Industrial and System Engineering, Telkom University, Bandung, Indonesia	IM	16
11.55-12.05	**IMPROVING THE SERVICE QUALITY OF DISTANCE EDUCATION USING INTEGRATION SERVICE QUALITY FOR HIGHER EDUCATION AND KANO** Istianah Nedia, Yati Rohayati, Maria Dellarosawati Idawicasakti School of Industrial and System Engineering, Telkom University, Bandung, Indonesia	QM	40
12.05-12.15	**DESIGN OF STANDARD OPERATING PROCEDURE (SOP) OF DESIGN AND DEVELOPMENT OF PRODUCT ACCORDING TO ISO 9001:2015 CLAUSE 8.3 BASED ON RISK BASED THINKING BY BUSINESS PROCESS IMPROVEMENT METHOD AT CV. XYZ** Rindy Aprilina Gita Prastyanti[1], Sri Widaningrum, Heriyono Lalu Faculty of Industrial Engineering, Telkom University, Bandung, Indonesia	QM	52
12.15-12.25	**DESIGN OF NONCONFORMITY AND CORRECTIVE ACTION STANDARD OPERATING PROCEDURE BASED ON INTEGRATED REQUIREMENTS FROM ISO 9001 AND ISO 14001** Rahmah Fadhilah, Sri Widaningrum, Heriyono Lalu Industrial Engineering Department, Telkom University of Engineering, Bandung Indonesia	QM	53

SEPTEMBER 21, 2016 SESSION 1 ROOM 1
Moderator : Dr. Lamto Widodo, S.T., M.T.

Time	Paper	Code	Paper Code
12.25-12.35	**DESIGN AND ANALYSIS PHYSICAL AND LOGICAL SECURITY USING TIA-942 AND ISO/IEC 27000 SERIES IN DATA CENTER OF PDII-LIPI** Mukhlis Anugrah Pratama, Mochammad Teguh Kurniawan, Information System Major, Industrial Engineering Faculty, Telkom University, Bandung, Indonesia	DSS	68

SEPTEMBER 21, 2016 SESSION 1 ROOM 2
Moderator : Dr. Ir. Syarif Hidayat, M.Eng.Sc, M.M.

Time	Paper	Code	Paper Code
11.15-11.25	**INCREASING PRODUCTIVITY WITH OBJECTIVE MATRIX METHOD CASE STUDY ON BUILDING MAINTENANCE MANAGEMENT PIO PT. XXX** R Bagus Yosan, Muhammad Kholil, Winny Soraya Industrial Engineering, Mercubuana University, Jakarta, Indonesia	IM	42
11.25-11.35	**LEAN PROJECT MANAGEMENT TO MINIMIZE WASTE, CASE STUDY : INDARUNGVI PROJECT, PT SEMEN PADANG** Nilda Tri Putri, Sarvina Department of Industrial Engineering, Faculty of Engineering, Andalas University, Padang, Indonesia	QM	38
11.35-11.45	**APPLICATION OF LEAN MANUFACTURING IN THE PRODUCTION OF SPUN PILE USING WASTE ASSESMENT MODEL AND VALUE STREAM ANALYSIS** Syarif Hidayat, Siti Nurlina Industrial Engineering Department, Faculty of Science and Technology, University Al Azhar Indonesia, Jakarta, Indonesia	PS	11
11.45-11.55	**THE IMPLEMENTATION OF CORPORATE SOCIAL RESPONSIBILITY OF STARBUCKS COMPANY** Charly Hongdiyanto Ciputra University, Indonesia	IM	72
11.55-12.05	**A MODIFIED ECONOMIC PRODUCTION QUANTITY (EPQ) WITH SYNCHRONIZING DISCRETE AND CONTINUOUS DEMAND UNDER FINITE HORIZON PERIOD AND LIMITED CAPACITY OF STORAGE** Jonrinaldi, Henmaidi, Nurike Oktavia Department of Industrial Engineering, Andalas University, Padang, Indonesia Master Program of Industrial Engineering, Andalas University, Padang, Indonesia	PS	44
12.05-12.15	**APPLICATION OF VALUE STREAM MAPPING IN THE NVOCC FCL SERVICE PROCESS TO MINIMIZE DELAY IN SUBMISSION OF THE DOCUMENT (A CASE STUDY IN PT YUSEN LOGISTICS INDONESIA)** M. Hudori, Nismah Panjaitan Department of Logistic Management, Citra Widya Edukasi Polytechnic of Palm Oil, Bekasi, Indonesia Department of Industrial Engineering, Sumatera Utara University, Medan, Indonesia	QM	76
12.15-12.25	**WAREHOUSE LAYOUT DESIGN USING SHARED STORAGE METHOD** Alan Dwi Wibowo, Rahmat Nurcahyo, Cut Khairunnisa Department of Agro-Industrial Technology,Universitas Lambung Mangkurat, Indonesia Departemen of Industrial Engineering, Universitas Indonesia,	PS	22

SEPTEMBER 21, 2016 SESSION 1 ROOM 2
Moderator : Dr. Ir. Syarif Hidayat, M.Eng.Sc, M.M.

Time	Paper	Code	Paper Code
	Indonesia		
12.25-12.35	**CABLE CLAMP PRODUCTION CAPACITY PLANNING USING ROUGH CUT CAPACITY PLANNING (RCCP) METHOD (A CASE STUDY IN PT FAJAR CAHAYA CEMERLANG)** M. Hudori Department of Logistic Management, Citra Widya Edukasi Polytechnic of Palm Oil, Bekasi, Indonesia	PS	80

SEPTEMBER 21, 2016 SESSION 1 ROOM 3
Moderator : Dr. Ir. Yogi Yogaswara, M.T.

Time	Paper	Code	Paper Code
11.15-11.25	**DEVELOPMENT OF ONLINE KNOWLEDGE MANAGEMENT CYCLE INDICATORS USING SECI APPROACH: CASE STUDY IN AN ENERGY COMPANY** Aldio Fikri Siddik, Amelia Kurniawati, Umar Yunan Kurnia Septo Hediyanto Industrial Engineering Department, Telkom University, Bandung, Indonesia Information System Department, Telkom University, Bandung, Indonesia	DSS	51
11.25-11.35	**MANAGEMENT INFORMATION SYSTEM FOR ORDER FULFILLMENT: A CASE STUDY** Johanes Fernandes Andry, Halim Agung, Yana Erlyana Faculty Technology and Design, Bunda Mulia University, Jakarta, Indonesia	DSS	3
11.35-11.45	**Risk Factor Analysis of Liquified Natural Gas (LNG) Supply Process Chain in Indonesia** Rahmat Nurcahyo, Farid Akbar, Yadrifil Kampus UI Depok Indonesia	SCM	14
11.45-11.55	**ENHANCING PENDULUM NUSANTARA MODEL IN INDONESIAN MARITIME LOGISTICS NETWORK** Komarudin, Muhammad Reza, Armand Omar Moeis System Engineering, Modeling and Simulation (SEMS) Laboratory, Department of Industrial Engineering, Universitas Indonesia	OR	49
11.55-12.05	**PURCHASING CONSORTIUM SYSTEM USING COMMON REPLENISHMENT EPOCH (CRE) MODEL BY DESIGNING MOBILE INFORMATION SYSTEM FOR SMALL and MEDIUM ENTERPRISES (SMEs)** Yudha Prasetyawan, Imam Baihaqi, Shinta Dewi Industrial Engineering Department, Sepuluh Nopember Institut of Technology, Surabaya, Indonesia Business and Management Department, Sepuluh Nopember Institut of Technology, Surabaya, Indonesia Agroindustrial Technology Department, Universitas Internasional Semen Indonesia, Indonesia	DSS	10
12.05-12.15	**DESIGN E-COMMERCE ANGON BASED ON MARKETPLACE TO INCREASE REVENUE FOR LIVESTOCK'S ACTORS (SELLING MODULE)** Atika Elysia, Irfan Darmawan, Muhammad Azani Hasibuan Department of Industrial Engineering, Telkom University, Bandung, Indonesia	IM	65

SEPTEMBER 21, 2016 SESSION 1 ROOM 3
Moderator : Dr. Ir. Yogi Yogaswara, M.T.

Time	Paper	Code	Paper Code
12.15-12.25	**CONTROL SYSTEMS DESIGN FOR AUTO JUDGEMENT CHECK MACHINE IN ROTOR ASSEMBLY LINE USING PROGRAMMABLE LOGIC CONTROLLER** Syahril Ardi, Moh Faiza Abu Rizal Production and Process Manufacture, Polytechnic Manufacture Astra, Jakarta, Indonesia	PS	31
12.25-12.35	**OPERATIONAL RISK IDENTIFICATION IN ADMINISTRATION SERVICES OF HIGHER EDUCATION** Robby Anzil Firdaus, Rahmat Nurcahyo, Anafi Yuan Septiari, Supriadi Industrial Engineering Departement, Universitas Indonesia, Indonesia	IM	17

SEPTEMBER 21, 2016 SESSION 2 ROOM 1
Moderator : Niken Parwati, S.T., M.M.

Time	Paper	Code	Paper Code
13.30-13.40	**SHELVES RE-DESIGN TO CONSIDER ASPECTS OF ERGONOMICS IN KOPETRI MINI MARKET, KARAWANG** Dene Herwanto, Sukanta University of Singaperbangsa Karawang, Karawang, Indonesia	6	ER
13.40-13.50	**COGNITIVE ERGONOMIC ANALYSIS OF PROFESSIONALS IN INDUSTRIAL DESIGNER APPAREL (Case Study: Designer at PT. Kurnia ASTASURYA)** Erwin M Pribadi, Ari Robiana Rijalah Industrial Engineering Department, Universitas Pasundan, Bandung, Indonesia	13	ER
13.50-14.00	**DESIGN CONCEPT OF WASHING GALLON USING DESIGN METHOD RATIONAL** Antonio Bennarivo Nainggolan, Mira Rahayu, Teddy Syafrizal Industrial Engineering Department, Telkom University, Bandung, Indonesia	56	ER
14.00-14.10	**DESIGNING ERGONOMIC CONVEYANCE TOOLS FOR SULFUR MINERS IN THE IJEN CRATER** Anny Maryani, Dyah Santhi Dewi, Elsa Camelia Harmadi, Pamungkas Dwi Admaja Industrial Engineering Department, ITS Surabaya, Indonesia	61	ER
14.10-14.20	**AUTOMATIC POLARIZING FILTER SYSTEM FOR WELDING MASK** Muhammad Ridwan Andi Purnomo, Riadho Clara Shinta, Rizqi Ramadhani, Ahmad Rizal Yassaruddin, Muhammad Iqbal Sabit Department of Industrial Engineering Universitas Islam Indonesia	47	ER
14.20-14.30	**DESIGN GALLON WASHING TOOLS USING ERGONOMIC FUNCTION DEPLOYMENT METHOD** Bintang Sri Perdana, Mira Rahayu, Teddy Syafrizal Industrial Engineering Department, Telkom University, Bandung, Indonesia	57	ER
14.30-14.40	**ERGONOMIC ANALYSIS FOR THE ARMOURED PERSONNEL CARRIER DRIVER** Halim Mahfudh, Lilik Zulaihah, Reda Rizal Department of Industrial Engineering, Universitas Pembangunan Nasional Veteran Jakarta	91	ER

SEPTEMBER 21, 2016 SESSION 2 ROOM 1

Moderator : Niken Parwati, S.T., M.M.

Time	Paper	Code	Paper Code
14.40-14.50	**APPLICATION OF ANALYTICAL HIERARCHY PROCESS TO CHOOSE CRITERIA FOR MOBILE PHONES** Dessi Mufti, Yesmizarti Muchtiar, Iswanto Industrial Engineering Department, Universitas Bung Hatta, Padang, West Sumatera, Indonesia	83	IM
14.50-15.00	**DESIGNING A PERSONAL SURVIVAL KIT IN FLOOD DISASTERS THROUGH PARTICIPATORY DESIGN APPROACH** Grace Novelia, Johanna Renny Octavia Industrial Engineering Department, Parahyangan Catholic University, Bandung, Indonesia	89	ER
15.00-15.10	**DESIGN IMPROVEMENT FOR POTATOES CULTERY TOOLS "POTTY" USING PRODUCT ARCHITECTURE ANALYSIS** Rahmat Ramadhani Bayu, Dicha Keci Barakin, Rendra Gilang Yuniarto, Muhammad Iqbal Industrial Engineering, Telkom University, Bandung, Indonesia	30	ER
15.10-15.20	**STUDY OF SHAFT POSITION IN GAS TURBINE JOURNAL BEARING** Rizky Arman, Iman Satria Mechanical engineering Dept, Faculty of Industrial Technolgy, Bung Hatta University, Padang, Indonesia	105	PS
15.20-15.30	**APPLICATION METHODS P-C-P TO IMPROVE QUEUE SERVICE QUALITY IN SUPERMARKET CASHIER AT THE PEAK DEMAND CONDITION** Yesmizarti Muchtiar, Muhibbullah Azfa Manik, Emil Endrivon Department of Industrial Engineering, Bung Hatta University, Padang, Indonesia	78	QM
15.30-15.40	**DESIGN E-COMMERCE ANGON BASED ON MARKETPLACE TO INCREASE PURCHASING EFFICIENCY FOR LIVESTOCK'S ACTOR (PURCHASE MODULE)** Pratiwi Galuh Putri, Irfan Darmawan, Muhammad Azani Departemen of Industrial Engineering Telkom University, Bandung, Indonesia	67	IM
15.40-15.50	**DEVELOPING INFORMATION SYSTEM OF LIBRARY ON E-SCHOOL QR-CODE BASED IN 13 NATIONAL HIGH SCHOOL USING EXTREME PROGRAMMING METHODOLOGY** Timbul Prawira Gultom, Nia Ambarsari, Muhammad Azani H. Department of Industrial Engineering, Telkom University, Bandung, Indonesia	71	DSS
15.50-16.00	**USING EDUQUAL AND KANO'S MODEL TO IMPROVE THE SERVICE QUALITY OF TRAINING AND CERTIFICATION PROGRAM** Iftitah Pratomo, Yati Rohayati, Sari Wulandari School of Industrial and System Engineering, Telkom University, Bandung Indonesia	23	IM
16.00-16.10	**DEVELOPMENT DETAIL DESIGN GALLON WASHER USING DESIGN FOR ASSEMBLY (DFA)** Mohamad Walid Anshar Ichsan Shahib, Mira Rahayu, Teddy Sjafrizal Industrial Engineering Department, Telkom University, Bandung, Indonesia	55	ER

SEPTEMBER 21, 2016 SESSION 2 ROOM 1

Moderator : Niken Parwati, S.T., M.M.

Time	Paper	Code	Paper Code
16.10-16.20	**MAKING A PLYWOOD BOAT CATAMARANS MODEL FOR HANDLING OF FLOOD EMERGENCY IN AREAS OF DURI KEPA** Indra Gunara Rochyat, Asnawati, Wahyu Albin Tabrani Product Design Department – Design & Creative Industry Faculty, Esa Unggul University, Jakarta, Indonesia	102	ER
16.20-16.30	**STUDY OF LIFT MARKET THROUGH GAP ANALYSIS** Niken Parwati, Nurhanisa Maysa, Aprilia Tri Purwandari Department of Industrial Engineering, Faculty of Science and Technology, Universitas Al Azhar Indonesia	93	IM

SEPTEMBER 21, 2016 SESSION 2 ROOM 2

Moderator : Inna Kholidasari, S.T., M.T., Ph.D.

Time	Paper	Code	Paper Code
13.30-13.40	**MAXIMUM PROFIT CALCULATION BASED ON THE QUANTITY OF DEMAND VEGATABLES WITH THE SINGLE ORDER QUANTITY METHOD** Annura Minar Gayatri, Nunung Nurhasanah, Ahmad Juang Pratama Industrial Engineering, Faculty of Science and Technology, Univerisity of Al Azhar Indonesia, Jakarta, Indonesia	84	PS
13.40-13.50	**DETERMINING THE INVENTORY POLICY FOR V-BELT USING PROBABILISTIC METHOD** Sukanta, Dene Herwanto University Singaperbangsa of Karawang, Indonesia	7	PS
13.50-14.00	**SYSTEM DYNAMICS BASED BALANCED SCORECARD TO SUPPORT DECISION MAKING IN STRATEGY OF PERFORMANCE IMPROVEMENT (A CASE STUDY IN THE UNIVERSITY)** Linda Theresia, Yenny Widianty, Dawi Karomati Baroroh Department of Industrial Engineering, Institut Teknologi Indonesia, Serpong, Indonesia Industrial Engineering, Universitas Gadjah Mada, Yogyakarta, Indonesia	8	DSS
14.00-14.10	**DRUG INVENTORY POLICY PROPOSAL USING PROBABILISTIC METHODS TO INCREASE THE SERVICE LEVEL** Sabila Syafitri Pambudi, Dida Diah Damayanti, Budi Santosa Chulasoh Departemen of Industrial Engineering, Telkom University, Bandung, Indonesia	74	PS
14.10-14.20	**AN AUTOMATED GUIDED VEHICLE SIMULATION THROUGH ROBOTINO TO HELP LEARNING COURSE INDUSTRIAL AUTOMATION** Tatang Mulyana, Haris Rachmat, Prasetia Pramudita Yuliarso Laboratory of Production Manufacturing and Automation, Faculty of Industrial Engineering, Telkom University, Bandung, Indonesia	33	PS
14.20-14.30	**THE IMPLEMENTATION OF ANALYTIC HIERARCHY PROCESS ON THE SELECTION OF SUPPLIER IN START-UP BUSINESS: A CASE STUDY** Ahmad Setyo Irawan, Liliani International Business Management, Universitas Ciputra, Surabaya, Indonesia	27	SCM

SEPTEMBER 21, 2016 SESSION 2 ROOM 2
Moderator : Inna Kholidasari, S.T., M.T., Ph.D.

Time	Paper	Code	Paper Code
14.30-14.40	**OPTIMAL PREVENTIVE MAINTENANCE OF TWO-PHASE MAINTENANCE POLICY FOR LEASED PRODUCT** Hennie Husniah, Andi Cakravastia, Bermawi P. Iskandar Department of Industrial Engineering, Langlangbuana University, Bandung, Indonesia Department of Industrial Engineering, Bandung Institute of Technology, Bandung, Indonesia	28	PS
14.40-14.50	**A SIMPLE MATHEMATICAL MODEL OF TECHNOLOGICAL TRANSFER WITH TWO COMPETING FOLLOWERS (A PRELIMINARY RESULT)** Hennie Husniah, Asep K. Supriatna Department of Industrial Engineering, Langlangbuana University, Bandung, Indonesia Department of Mathematics, Padjadjaran University, Bandung, Indonesia	29	OR
14.50-15.00	**INCREASING PRODUCTIVITY OF PT. XYZ THROUGH THE UTILIZATION OF STANDARD TIME AND THE TWO HANDED PROCESS FOR PANEL BOX PRODUCTION** Arnolt Kristian Pakpahan; Didien Suhardini; Arum Tri Astuti Organizational and Business Development Laboratorium, Industrial Engineering, Faculty of Industrial Engineering, Trisakti University	100	IM
15.00-15.10	**JOB SHOP SCHEDULING AT IN-HOUSE REPAIR DEPARTMENT IN COLD SECTION MODULE CT7 ENGINE TO MINIMIZE MAKESPAN USING GENETIC ALGORITHM AT PT XYZ** Michael Whizo Mayto, Pratya Poeri Suryadhini, Murni Dwi Astuti Industrial Engineering Study Program, Industrial Engineering Faculty, Telkom University, Bandung, Indonesia	99	PS
15.10-15.20	**CAPACITATED VEHICLE ROUTING PROBLEM WITH TIME WINDOWS FOR MILK COLLECTION AT KPBS PANGALENGAN** Tjutju Tarliah Dimyati Industrial Engineering Department, Pasundan University, Bandung, Indonesia	34	OR
15.20-15.30	**AN APPLICATION OF DIFFERENTIAL EVOLUTION ALGORITHM IN SPARE PART LOGISTICS** Said Badrul Nahar , Sakesun Suthummanon, Wanatchapong Kongkaew. Industrial and Systems Engineering, Prince of Songkla University, Songkla, Thailand	109	SCM
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16.20-16.30	**VARIABLE ANALYSIS OF IMPROVING THE QUALITY OF SERVICE DELIVERY PACKAGE BY USING IMPORTANCE PERFORMANCE MATRIX METHOD AND KANO MODEL** Dwi Novirani, Abu Bakar, Janet Apongtinamba. Industrial of Engineering Institut Teknologi Nasional, Bandung, Indonesia	15	QM
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15.30-15.40	**THE RELATIONSHIP BETWEEN TEACHING PROCESS AND QUALITY USING THE LINEAR STRUCTURE (LISREL) MODEL IN INDUSTRIAL ENGINEERING DEPARTMENT** Tiena Gustina Amran Trisakti University, Jakarta, Indonesia	98	IM

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Moderator : Dr. Rina Fitriana, S.T., M.M.

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08.20-08.30	**CONCEPTUAL MODEL OF SUPPLY CHAIN MANAGEMENT FOR HIGHER EDUCATION** Fajar Kurniawan Saint Mary's University of Hong Kong	105	SCM
08.30-08.40	**FEEDBACK FROM USERS ON A DESIGN OF WEB-BASED INVENTORY AND PRODUCT ORDERING SYSTEM FOR A UNIFORM MAKER** Gamma Habie Azzaky, Endang Chumaidiyah, Wawan Tripiawan Industrial Engineering Faculty, Telkom University, Bandung, Indonesia	88	DSS
08.40-08.50	**FACTORS INFLUENCING INNOVATION MANAGEMENT PRACTICES IN NIGERIA TEXTILE MANUFACTURING FIRM'S** Mohammed Ndaliman Abubakar Department of Business Admin & Management, The Federal Polytechnic (FPB), Niger State, Nigeria	112	IM

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08.40-08.50	**DETERMINING THE ROUTE FOR SOLID WASTE TRANSPORTATION FROM TPS TO SPA USING VRP– NEAREST NEIGHBOR FOR 10m^3 VEHICLE ON SERVICE AREA SOUTHERN BANDUNG AND EASTERN BANDUNG** Wahyukaton, Anni Rochaeni, Sunarya Industrial Engineering Pasundan University, Bandung, Indonesia Environmental Engineering Pasundan University, Bandung, Indonesia	21	OR

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DSS – Decision Support System and Artificial Intelligence

ER – Ergonomics

ER Ergonomics

IM Industrial Management

IM – Industrial Management

OR – Operation Research

OR – Operation Research

PS – Production System

PS – Production System

QM – Quality Engineering & Management

QM – Quality Engineering & Management

SCM – Supply Chain Management

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A BRIEF REVIEW IN SOME DISSERTATIONS ABOUT BUSINESS INCUBATOR PROCESS FRAMEWORK AND PERFORMANCE IN SOME COUNTRIES

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Universitas Tarumanagara, Jl. S. Parman no.1, Jakarta, Indonesia

ABSTRACT

Framework and performance review that is for the investigation of the under-researched phenomenon of business incubation performance in the world. This contributes to knowledge by offering a fresh perspective on how the entrepreneurial process might be studied within a business incubator environment. This paper will figure the business incubation process framework and performance in Malaysia, Australia, South Africa, Developing Countries.
Key words: Business Incubator, Performance, Framework, Some Countries

1. INTRODUCTION

The literature review provided the necessary background which allowed the researcher to develop a conceptual framework for the study acting as the foundation of the thesis. The research involves qualitative and quantitative methodology. In the first instance, a series of interviews of incubator board members, managers and tenants was completed and documented. Material derived from the interviews, along with internet sourced information, provided a qualitative data base of incubation practice supporting the development of an e-mail survey that was distributed throughout the incubator industry. A series of propositions were tested using survey response material, interpretation including a descriptive investigation followed by bivariate and multivariate analysis (Trewartha, 2012).

The history of business incubators began in 1956, Massey-Ferguson, the largest industry in Batavia, N.Y., closed down, leaving vacant an 850,000 square foot complex of multistory buildings and driving unemployment to more than 20 percent. (NBIA, 2016). Frank Mancuso, who is known as the ―father of business incubators‖ was quoted as telling the story of how the first incubator originated (Kmetz, 2000).

According to Kmetz, a small town in New York had experienced significant job losses due to the relocation of many manufacturing industries to the south and west coast of the country. A chicken incubator that once hosted several poultry growers was left vacant and Mr. Mancuso, who was then the mayor, decided to turn the vacant building into a place where entrepreneurs could start up their businesses. Entrepreneurs were charged a minimal rental and were provided with shared phone services. This was the basic idea that formed the foundation of business incubation which still holds in many modern incubator models.

The concept of incubator performance is based on theoretical frameworks proposed by Mian (1997) which centres around the performance and effectiveness of university-based technology incubators (UBTIs). Mian (1997) puts forward an integrated performance assessment framework derived from extant literature on business incubation, the involvement of universities in technology and business advancement, and the conventional approaches to organizational evaluation. The proposed framework adopts the overall systems perspective combining four programme effectiveness approaches from organizational assessment literature, namely the goal approach; the system resource approach; the stakeholder approach; and the internal process approach (Mian, 1997). A second theoretical approach explored in this research originates from the work of Hackett and Dilts (2008) who advance a

'black box' theory of business incubation which involves presenting sorely needed validated scales for assessing the process of business incubation, as well as an empirically-based theoretical model of the incubation process (Kavhumbura, 2014).

2. LITERATURE REVIEW

2.1. An Empirical Analysis into the Underlying Components Impacting Upon Business Incubation Performance of Malaysian ICT Incubators (Fararishah Abdul Khalid, 2012)

This study extends current research (Hackett & Dilts, 2008) by investigating an additional construct which examines targeted areas of professional management services including marketing and promotion (Rice, 1993; Lalkaka, 1997; Scaramuzzi, 2002), strategic management (Agarwal, 2002; Wiggins & Gibson, 2003; O'Neal, 2005), financial management (Lalkaka & Abetti, 1999; Beng Hui, Fernandez & Sio, 2011), and staff and personnel management (Read & Rowe, 2003; Studdard, 2006; Hallam & DeVora, 2009).
The questionnaire incorporates 251 items and comprises six sections consisting of:

- Profile of Incubatees
- Selection Performance
- Monitoring and Business Assistance Intensity
- Resource Allocation
- Professional Management Services
- Business incubation performance

The original survey instrument developed by Hackett & Dilts (2008) intended to establish the elements within the business incubation black box. Here their work is extended in the process of identifying the relationships between underlying factors in the incubation process and business incubation performance.

The conceptual design of the study (Figure 1) provided an appropriate exploratory framework for the investigation of the under-researched phenomenon of business incubation performance in Malaysia. The conceptualisation of the research design was guided and adapted from a previously developed framework by Hackett and Dilts (2004, 2008). The literature provided various incubation models that described a typical incubation process but included limited research on how incubation outcomes occur. The present research makes a positive contribution to fill that gap and contributes to the development of theory in powerful ways. In particular, this Dissertation presents a composite model (Figure 2) of the business incubation process and the impacts on business incubation performance which is valuable to researchers, policymakers, and practitioners.

This study extends previous research by examining business incubation process constructs and their relationship with three metrics of business incubation performance. The framework promises valuable opportunities for research to be undertaken within the context of 192 business incubation. Researchers can utilize present findings from the thesis to examine further relationships between the components and extend performance measures of incubators to include for example producing sustainable ICT incubates.

Second, further research is necessary to assess the framework developed in this thesis across different types of incubators (i.e. biotechnology incubators, university incubators, and general type incubators). Development of the framework for specific incubator sectors could present opportunities for further understanding of the complex phenomenon providing mechanisms for uncovering processes related to business incubation performance. The newly developed frameworks could enrich and prompt formulation of new research questions.

Third, the examination of business incubation process and performance should be undertaken in a longitudinal study. Longitudinal studies will afford deeper understanding of the impacts of business incubation process over time.

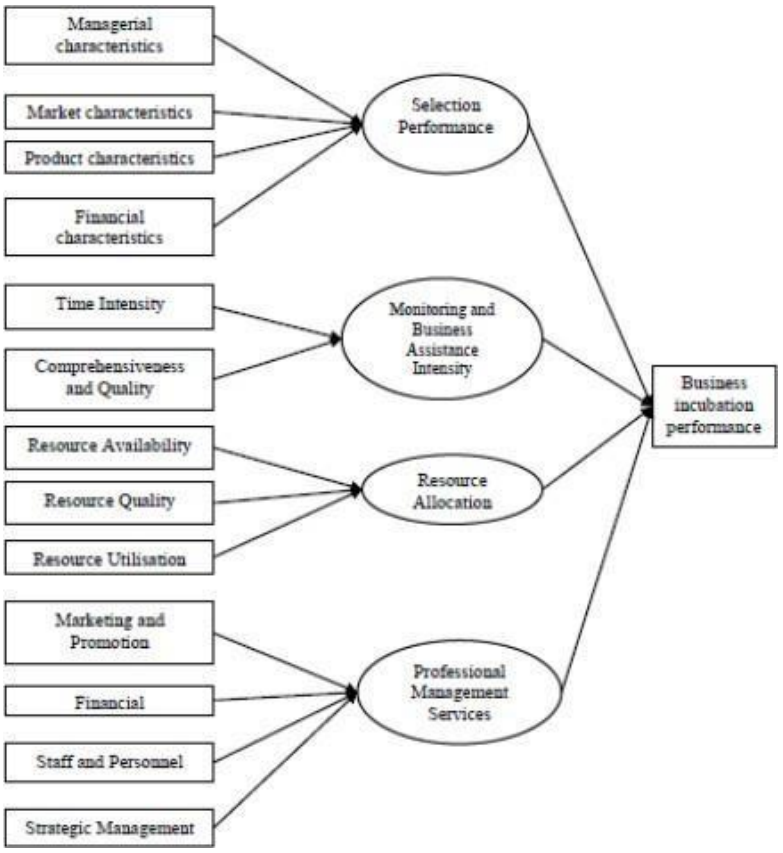

Figure 1. Hacket & Dilts Proposed Theoritical Framework of Business Incubation Process

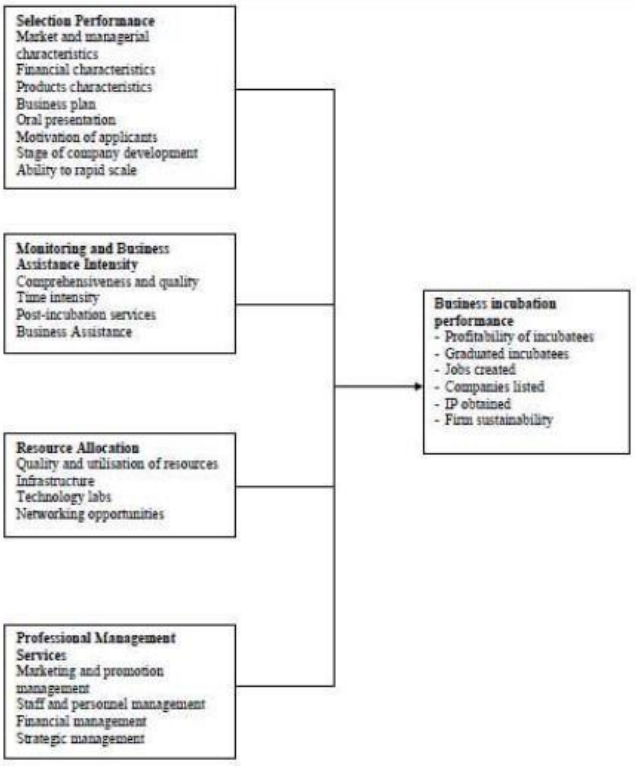

Figure 2. Khalid Composite Model Integrating Elements from both methodologies that impacts on business incubation performance

Finally, further research is required to address the inefficiencies in existing business incubation process in order to ensure that incubators are all operating in the *third-generation* model. Significant consideration has been focused to establishing incubators in the country, yet less attention has been paid in designing an incubation program that not only accelerate the growth of incubates, but also ensures the sustainability of the incubates.

2.2. Stakeholder Goal Achievement in Australian Business Incubators (Graeme Edward Trewartha, 2012)

The findings of this study have lent support to a steadily expanding body of analysis which contends that business plans represent an over-emphasized area of business preparation. The results show that a statistically significant proportion of managers expressed the opinion that business plans receive very little attention once they have served their purpose at the selection stage of incubator tenancy. Provision of a business plan is an accepted element of new business preparation in many areas of business development. Findings from this study suggest that confidence in this business development activity may be misplaced. Any business planning role in support of start-up and ongoing business development is an area requiring further analysis. The issue, and its implications, extend beyond the scope of this study.

Results of the survey would suggest that the incubation 'not-for-profit' issue is of topical interest among contemporary incubator management groups. All of the initial interview respondents were part of 'notfor- profit' incubator organizations. Responses to the survey question (should an incubator be a 'for profit' organization?) indicated that many board members and managers in Australian incubators who would prefer a 'for-profit' model.

The literature has identified areas of research, including institutional and stakeholder theory, as representing previously unidentified components in contributing to a theoretical rationale for development of incubation. Many of the findings support prior research in these two areas of study. However, results suggest that the aforementioned areas of research require further empirical scrutiny to investigate the role of normative institutional pressures on incubator stakeholder goal achievement outcomes.

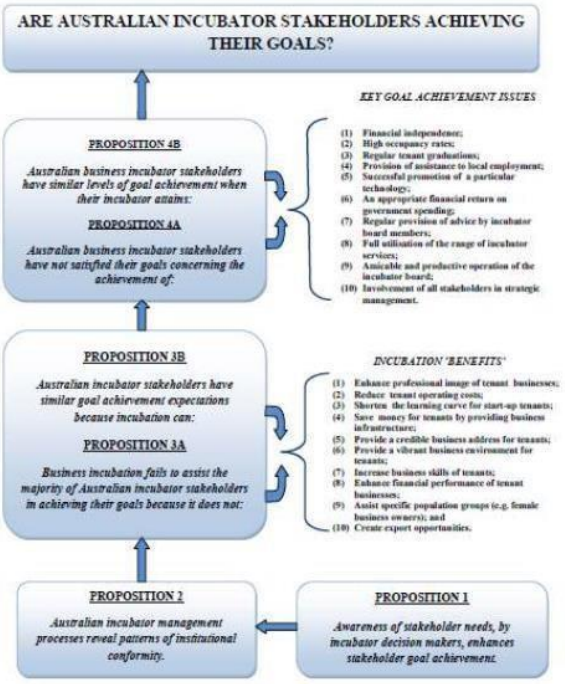

Figure 3. Trewartha's Conceptual Framework

The conceptual framework highlights the premise that the business incubator 'field' has manyparticipating stakeholders including board members, incubator managers and incubator business tenants. Each stakeholder group, according to Lalkala (2001, p. 5), exhibits specific predilections in explaining their participation in business incubation, to the extent that these differences may significantly influence the goals of each stakeholder. One of the purposes of this study was to establish whether significant differences exist among survey respondents (Sekaran 2000, p. 127). Or, do all stakeholders exhibit similar attitudes toward goal achievement?

2.3. Beyond Godisa: Critical Success Factors for Business Incubators in South Africa (Vimbainashe O Kavhumbura, 2014)

According to existing literature in several fields including economics, entrepreneurship and sociology, entrepreneurship is a key factor of economic growth in today's increasingly competitive global economy. In South Africa, SMMEs (Small Medium Micro Enterprises) and entrepreneurship have the potential to accelerate economic development and promote job creation. As such, significant resources have been allocated to their growth and development by the South African government. Despite this input, SMMEs face many challenges that impede their growth and development.

Given that the new B-BBEE (Broad-Based Black Economic Empowerment**)** codes place a strong emphasis on enterprise development, it is important to examine how initiatives to support the growth of SMMEs can be made more effective. Business incubators and other BDS (Business Development Services) firms provide a way to assist small, young firms to develop into successful businesses quickly and with relatively less risk. In order for this to happen, the incubators themselves must perform well and be sustainable. In light of this, it is crucial to identify the factors that lead to successful incubation within the South African context.

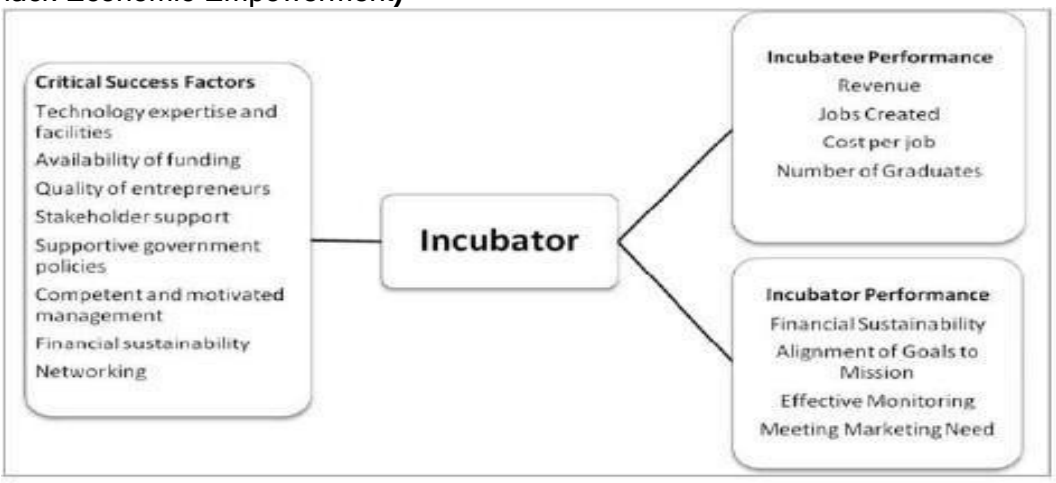

Figure 4. Kavhumbura's Conceptual Model of Critical Success Factors for Business Incubation in SouthAfrica

SUB PROBLEM	RESEARCH QUESTION/PROPOSITION/HYPOTHESIS
Establish the antecedents of successful incubation in the South African context	**Research Question 1: Are the critical success factors of the GODISA case study still significant?** H1: There is a positive relationship between access to technical expertise and incubator success. H2: There is a positive relation between the availability of funding, and incubator success H3: There is a positive relationship between stakeholder support and incubator success H4: There is a positive relationship between supportive government policy and incubator success H5: There is a positive relationship between management competencies and compensation and incubator success H6: There is a positive relationship between financial sustainability and incubator success H7: There is a positive relationship between networking and incubator success H8: There is a positive relationship between stringent selection criteria and incubator success
Evaluate the relationship between type of incubation model used and the performance of incubators in South Africa.	**H9: There is a relationship between the performance of incubators and the incubation model used**

Figure 5. Kavhumbura's summary of research Sub-Problems

Collectively, the following propositions, as listed in Table 4 below, encapsulate how certain aspects of both the external and internal environments as well as the model of incubation in use may relate to the performance of business incubators. Literature commonly cites small and medium enterprises as the protagonists of economic and social development in emerging economies (Agupusi, 2007; Rogerson, 2001). Subsequently, the promotion and growth of small business has taken on an increasingly prominent role in development planning and policy in emerging African economies (Aggarwal, 2012). In South Africa, entrepreneurship is seen as a solution to bridging the widening wealth gap and reducing the effects of poverty and historic inequality (Herrington et al., 2010). Many African countries see business incubation as a way to instill an entrepreneurial culture. Business incubation and BDS in its broader form are considered as a solution for the poor survival rates among small and new firms (Aggarwal, 2012). This may be one reason that business incubation continues to grow in emerging market economies. A primary motivation for this research was that due to the relative infancy of the BDS and incubation environment in South Africa, there is limited literature that can offer insight into the current state of business incubators in the country. This research set out to examine previously identified critical success factors of business incubators in South Africa and assess their relation to the performance of BDS firms. The aim was to ascertain which factors play a significant role in the performance of business incubators, making them an effective vehicle for enterprise development and national economic growth. To this end, this research dealt with two sub-problems, namely: a. To establish the antecedents of successful incubation in the South African context; b. To evaluate the relationship between type of incubation model used and the performance of incubators in South Africa. The findings of this research indicate that the business incubation and small business development landscape of South Africa has evolved and perhaps grown more sophisticated as more firms have emerged in response to situational and contextual factors. Certain critical success factors remain applicable, while others have undergone change. The types of services offered and business models for BDS firms have evolved but there is still no clear differentiation between different service providers. As such, questions still exist around a definitive list of success factors specifically for South African BDS as well as a suitable model of business incubation.

2.4. The role of business incubators in developing entrepreneurship (PINGPING MECKEL, 2014)

2.4.1. Pre-BIC

All twenty participants shared one thing in common before coming to BIC. In order to qualify as a tenant, all of them had a business idea that they had presented to a selection panel during an entry interview. Some ideas or businesses were more developed than others.

2.4.2. During BIC

During their time in BIC, four experiences were common to all twenty participants:

1. Having social interactions with other tenants in BIC;
2. Developing businesses or ideas while in BIC;
3. Having interactions with BIC management;
4. Viewing social interactions and/or the entrepreneurial atmosphere as an important element of being in BIC.

2.4.3. Post-BIC

The fact that the majority of participants stayed in BIC for another year perhaps reflects their positive feelings towards the incubation experience. Six pathways through the BIC process emerged from the data. Participants are selected to represent these pathways. Their experience was so well articulated by them, it can be used to exemplify others and bring their stories to live. To provide a better contextual understanding of each pathway, a short summary is first presented for each case.

Vignettes are then employed to bring their stories to life.

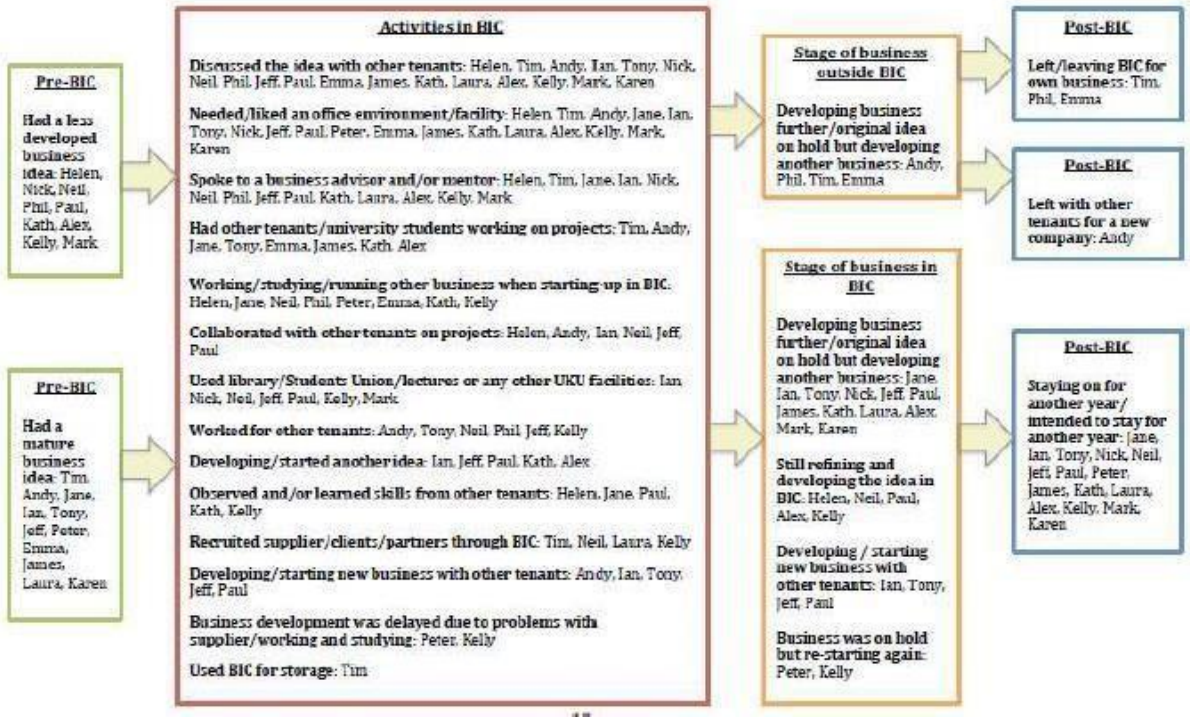

Figure 6. Meckel's the process of business incubation

Meckel's Summary :

One of the important findings of the research shows that it is the learning environment, which is important for idea generation and development of the incubates. Hence how to develop and maintain this supportive learning environment has crucial implications to incubator managers, users and policy makers.

The study suggests a number of factors that impact on opportunity identification, and which in turn can contribute to the effectiveness of business incubators in nurturing and developing nascent entrepreneurs. By identifying the important components and process of opportunity development, the research has the potential 185 to raise awareness among BI practitioners of the need to support and develop learning strategies.

The outcomes of the study suggest that by gaining a deeper understanding of the process of business incubation, policy makers may be able to better target funds in areas such as a more nuanced approach to recruitment in BIs, providing relevant information to individual incubates, building knowledge and experience, developing a supportive community and importantly encouraging and supporting learning. This will help to set up and maintain a more effective BI and enhance entrepreneurial activities in the BI and local areas.

The outcomes of the study demonstrate how a BI with tenants with mixed backgrounds and a broad range of prior knowledge can encourage and facilitate learning, which leads to developing new business opportunities. This is an important finding for policy makers, who should consider shifting funding from high-tech incubators to mixed incubators.

3. RESULT AND CONCLUSION FOR FUTURE RESEARCH

In Khalid's dissertation (Malaysia case) stated about the factors in his model consist of Selection or Entry Criteria, Monitoring, Resource Allocation or Facilities, and Management Services in Marketing and Finance as dependent variable to Performance of Business Incubator as

independent variable. In Trewartha's Conceptual Framework stated how Australian incubator stakeholder achieving their goals and indicated that many board members and managers would prefer a 'for-profit' model. In Kavhumbura's dissertation enhance that there is a relationship between the performance of incubators and incubation model used. His model stated about the factors of technology, facilities, funding and financial, quality of entrepreneur, government support, manager competency, networking as a success factors for Business Incubator performance of success. Meckel's dissertation stated about the model of process of business incubation, he enhance the development and maintain the learning environment has a crucial implication to incubator managers, users and policy makers. Meckel suggest that by gaining a deeper understanding of the process of business incubation, policy maker may be able to better target funds. Business with mixed backgrounds tenants and a broad range of prior knowledge can encourage and facilitate learning, which leads to developing new business opportunity.

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