



**PROCEEDING**

# ICoIESE 2017

*2017 International Conference on  
Industrial, Enterprise, and  
System Engineering*

28 November 2017  
The Trans Luxury Hotel Bandung, Indonesia

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# WELCOME MESSAGE

It is our privilege to welcome all presenters, participants, delegates, experts and scholars to the 1<sup>st</sup> International Conference on Industrial, Enterprise, and System Engineering (ICoESE-2017).

The support of enterprise application software (EAS) for day to day activities within one organization becomes crucial to the success of an organization. Enterprise Application Software (EAS) is computer software used to satisfy the needs of an organization rather than individual users. Such organizations would include industries, services, interest-based user groups, charities, or governments. New application developments have allowed organizations to not only improve the processes effectiveness and efficiencies for greater productivity, but have also provided businesses in order to cut costs, plan for the future, and maintain competitive advantage in the information era.

The 1st International Conference on Industrial, Enterprise, and System Engineering (ICoESE-2017) aims to bring together researchers, engineers and practitioners interested in the advances and business applications of information systems. Eight simultaneous tracks will be held, covering different aspects of Soft Computing and Data Mining, Information System, Software Engineering, Enterprise Architecture, Manufacturing System, Industrial and Supply Chain Management, Ergonomics and Human Factors, and Engineering Management. The tracks covered in ICoESE-2017 are expected to facilitate and drive innovative ideas for attaining better quality as well as solving real-world problems in enterprise.

This ICoESE-2017 is an activity organized by School of Industrial Engineering, Telkom University, Bandung, Indonesia. The conference co-technical sponsored by IEEE Indonesia Chapter. ICoESE-2017 held in conjunction with The IEEE Asia Pacific Conference on Wireless and Mobile 2017 (APWiMob-2017), organized and sponsored by the IEEE Communications Society Chapter Indonesia. Indeed, we are honored to host this event and would like to express our gratitude to authors which contribute to the numbers of accepted papers, which indicates a support from researchers throughout the globe.

The conference has attracted many local and international participants. We have received 105 submissions from 9 countries (including Indonesia, Malaysia, Germany, Poland, Taiwan, India, Japan, Pakistan, and The Netherlands). The ICoESE-2017 conference also presented two special sessions:

1. Information Reduction Using Rough Set Theory and Conditional Entropy by Prof. Dr. Mustafa Mat. Deris from Universiti Tun Hussein Onn Malaysia and;
2. Born Global Innovation – Towards Sustainable, Collaborative Innovation Processes Across Borders by Prof. Dr. Jan Martin Pawlowski from Business Information Systems at the Ruhr West University of Applied Sciences and Research Professor at the University of Jyväskylä, Finland.

Each paper submitted was screened by the proceeding's chairs and carefully peer-reviewed by 3 experts from Program Committee. Finally, only 46 papers with the highest quality and merit were accepted for oral presentation in this ICoESE-2017 and will be submitted to IEEE.

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Finally, we would like to express my sincere gratitude to the IEEE Indonesia Section. My thanks also go to Dean of School of Industrial Engineering, Telkom University especially to all committees for their utmost and kind support in organizing our very First International Conference on Industrial, Enterprise, and System Engineering.

Lastly but not least, I would like to thank you all again for being here. I hope your experience at this event would be both beneficial and memorable.

I wish the conference will be a recurrent event and Enjoy to visit Bandung!

Chair of ICoESE-2017  
Dr. Irfan Darmawan

## PROGRAM AT A GLANCE

The 1st International Conference on Industrial, Enterprise, and System Engineering (ICoESE-2017) aims to bring together researchers, engineers and practitioners interested in the advances and business applications of information systems. Eight simultaneous tracks will be held, covering different aspects of Soft Computing and Data Mining, Information System, Software Engineering, Enterprise Architecture, Manufacturing System, Industrial and Supply Chain Management, Ergonomics and Human Factors, and Engineering Management.

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Secretariat of the conference is located at Jl. Telekomunikasi Terusan Buah Batu No.1, Gedung Karang, Bandung, Jawa Barat 40257 Indonesia. The information of the conference accessible through official website of the conference in <https://icoiese.org/web/>.

The conference was held on 28 November 2017 at The Trans Luxury Hotel Bandung, Jawa Barat, Indonesia. Located at Jl. Jendral Gatot Subroto No.289, Cibangkong, Batununggal, Bandung City, Jawa Barat 40273. The conference attended by 46 participants, which presented their manuscript in oral presentation. The parallel session divided into 3 sessions and each session conducted in 3 rooms. One room consist of 5-8 participants, each participant presented their paper within 15 minutes, including question and answer session.

Following is the rundown:

<b>Time</b>	<b>Activity</b>
08.00 AM	<b>REGISTRATION</b>
08.45 AM	<b>SAFETY CONDUCT</b>
09.00 AM	<b>OPENING CEREMONY</b>
09.10 AM	<b>CONFERENCE REPORT</b> Dr. Irfan Darmawan, Chair of ICoESE-2017
09.20 AM	<b>OPENING REMARKS</b> Prof. Dr. Mochamad Ashari, Rector of Telkom University
09.30 AM	ART PERFORMANCE
09.50 AM	<b>KEYNOTE SPEECH-1</b> Prof. Dr. Mustafa Mat Deris from Universiti Tun Hussein Onn Malaysia
10.15 PM	<b>KEYNOTE SPEECH-2</b> Jan Martin Pawlowski from Business Information Systems at the Ruhr West University of Applied Sciences and Research Professor at the University of Jyväskylä, Finland
10.45 AM	<b>PARALLEL SESSION ANNOUNCEMENT</b>
11.00 AM	<b>PARALLEL SESSION 1</b>
12.30 PM	<b>LUNCH</b>
01.30 PM	<b>PARALLEL SESSION 2</b>
03.00 PM	<b>COFFEE BREAK</b>
03.30 PM	<b>PARALLEL SESSION 3</b>
07.00 PM	<b>CLOSING</b> Conference Gala Dinner, Best Paper Awards, Photo Session.

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# ***PROPOSAL OF MAINTENANCE POLICY ON BARMAG FK6800 MACHINE IN YARN COMPANY USING RELIABILITY-CENTERED MAINTENANCE AND RISK-BASED MAINTENANCE METHOD***

Irsalina Maharani

Department of Industrial Engineering  
Telkom University  
Bandung, Indonesia  
irsalmaharani@gmail.com

Fransiskus Tatas Dwi Atmaji

Department of Industrial Engineering  
Telkom University  
Bandung, Indonesia  
franstatas@telkomuniversity.ac.id

Nopendri

Department of Industrial Engineering  
Telkom University  
Bandung, Indonesia  
nopendri@telkomuniversity.ac.id

**Abstract**—XYZ is a company that is engaged in the textile industry since 1974. XYZ has some different kinds of yarns which through several production processes in 24 hours a day to fulfill the market demands. Therefore, all machines have to be in the best condition as it can be. These machine should be maintained optimally so all production goals could be achieved with the minimum cost of maintenance. This study will use Reliability-Centered Maintenance (RCM) method to get the right preventive task and time interval for maintenance and Risk-Based Maintenance (RBM) method to find the risk value related to the economic aspect of the company. The output of the RCM method would be 18 Scheduled Discard Task and 6 Scheduled Condition Task for the subsystem machine and the time interval of the repair will be different depending on the type of tasks and components. The repair cost for preventive maintenance task in a year is IDR 2.029.266.063. By implementing the RBM method, the risk value will be IDR 269.768.775 if the company is not doing the preventive task proposed in this study.

**Keywords**— Preventive Maintenance, Reliability-Centered Maintenance, Risk-Based Maintenance

## I. INTRODUCTION

XYZ has a degradation of production capacity which happened in the year 2014 – 2015. One of its cause is the high frequency of machine's downtime. Eight units of Barmag FK6800, 301 – 308, are the machines for the core process in the plant. From all those eight machines, 306 has the highest number of downtime, which is 91 times failure, 955 hours and 5 minutes during 2 years, according to the company's historical data. These condition cause production loss for the company. Therefore, the company needs maintenance policy proposal for Barmag FK6800 number 306 machine so it can work as optimal as it can be and will not evoke bigger amount of loss. RCM method can be used to decide the correct maintenance policy for the machine. After obtaining the

policy, RBM method can be used to obtain the value of the risk that occurs if no maintenance policy applied for the machine.

## II. BASIC THEORY

### A. Maintenance Management

The definition of maintenance is making sure a physical asset (system/device/component) can work properly as the user wants [1]. Planned maintenance, like preventive maintenance, is a periodical inspection to detect a condition that can stop the production process or make the function of the machine decrease, then combining with maintenance to control or eliminate the condition and restore it to the initial condition. It is also detecting and handling the abnormal condition before it causes failure or loss [2]. Unplanned maintenance is a maintenance task which should do an action soon to prevent a serious effect, like loss production, big damage of the device, or for the safety [3].

### B. Reliability-Centered Maintenance (RCM)

RCM is a process used to determine the maintenance requirements of any physical asset in its operating context. [1]. The main purpose of RCM is (1) build the priority to support preventive maintenance task, (2) get information to improve component's design by the unfulfilled reliability, (3) develop the preventive maintenance task to restore the reliability of the component and the safety of the machine when it fails, (4) fulfill those purpose with the minimum cost. The Mean Time to Failure (MTTF) data is the mean interval between the first failure to the next failure of the component. The Mean Time to Repair (MTTR) data is the mean interval between the first repair to the next repair of the component [4]. In the process, an analysis of Failure Mode & Effects Analysis (FMEA) is performed to identify the failure mode that tends to cause any



functional failure. Next is the decision-making with the RCM diagram. There are three categories of preventive tasks, which are scheduled on-condition tasks, scheduled restoration tasks, and scheduled discard tasks. The basic pattern of damage to the machine may change as time goes by[3].

### C. Risk-Based Maintenance (RBM)

RBM is a quantitative method based on the integration of the approach between reliability and a risk strategy aimed at optimizing maintenance schedules[5]. The main purpose of RBM is to minimize component failure without affecting the environment. RBM aims to minimize the risks arising from the failure that occurred.

## III. RESEARCH METHODOLOGY

Based on the conceptual model in Figure 1 below, this research starts with choosing the critical subsystem on the machine. Then RCM method measuring will be implemented to get the preventive task and the cost. After that, RBM method will be conducted to get the risk value. Both methods will be combined to get the right maintenance task policy.

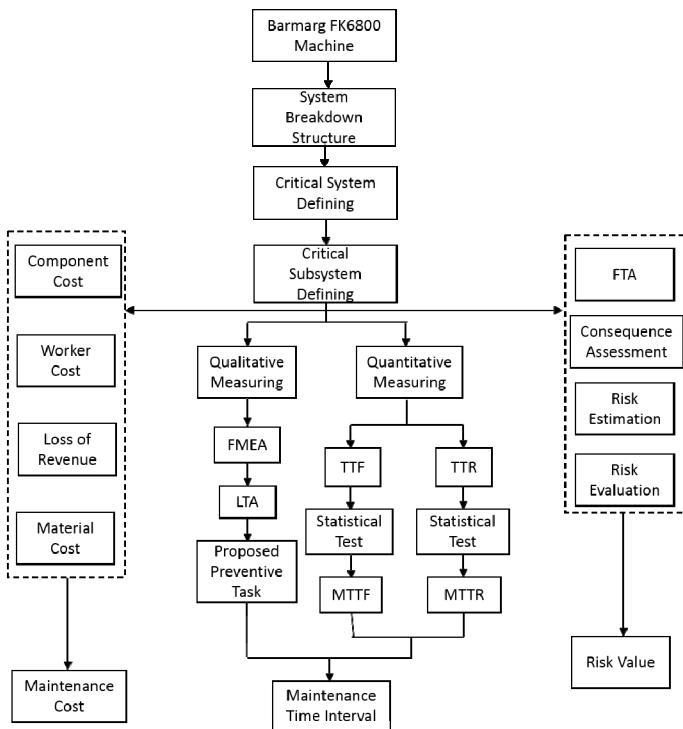


Fig. 1 Research Methodology

## IV. ANALYSIS

To do data processing using the RCM and RBM, the data will be collected from the company. The first step is describing the object of the research which is Barmag FK6800 number 306 machine. Data needed for this research is the description of the machine, machine's structure, failure data, the existing maintenance task data, list of components, component pricing, loss of revenue data, and labor cost. After that, activities that

will be conducted including the selection of systems and critical subsystems using RPN (Risk Priority Number) for ranking some functional aspects by interviewing the maintenance crews in the company.

### A. MTTF & MTTR Calculation

Below in Table I and Table II are the calculation of MTTF and MTTR. Both can be calculated from the company's historical failure and repair data on Barmag FK6800 number 306. Since the whole data are Weibull distribution, then the calculation of the MTTF and the MTTR will be using AvSim software to obtain the parameters.

TABLE I. MTTF CALCULATION

Component	Distribution	Parameter		(1/β +1)	Gamma Value	MTTF (hrs)
		η	β			
TB Upper Traverse Shaft Puller Side A	Weibull	η	3018,42	2,36	1,21	3654,46
		β	0,74			
TBD Roll2 Puller Side A + B	Weibull	η	2145,92	2,43	1,27	2727,29
		β	0,70			
TB Upper Shaft Take of Roll Puller Side A	Weibull	η	1797,51	2,26	1,14	2046,93
		β	0,79			
TB Lower Shaft Take of Roll Puller Side A	Weibull	η	3049,27	2,61	1,44	4390,06
		β	0,62			
TB Lower Shaft Take of Roll Puller Side B	Weibull	η	2374,64	2,39	1,23	2928,28
		β	0,72			
TBD Roll3 Puller	Weibull	η	4089,33	2,52	1,35	5520,64
		β	0,66			

TABLE II. MTTR CALCULATION

Component	Distribution	Parameter		(1/β +1)	Gamma Value	MTTR (hrs)
		η	β			
TB Upper Traverse Shaft Puller Side A	Weibull	η	6,84	1,373	0,889	6,083
		β	2,68			
TBD Roll2 Puller Side A + B	Weibull	η	4,42	1,580	0,891	3,940
		β	1,72			
TB Upper Shaft Take of Roll Puller Side A	Weibull	η	7,94	1,125	0,942	7,477
		β	7,97			
TB Lower Shaft Take of Roll Puller Side A	Weibull	η	3,00	1,885	0,957	2,874
		β	1,13			
TB Lower Shaft Take of Roll Puller Side B	Weibull	η	9,18	1,458	0,886	8,128
		β	2,18			
TBD Roll3 Puller	Weibull	η	8,02	1,576	0,891	7,143
		β	1,74			

### B. RCM Calculation

The cause of occurring failures can be identified by using RCM Information Worksheet. Every critical component will be analyzed from its FMEA (Failure Mode & Effect Analysis), by interviewing the maintenance crew. After that RCM Decision Worksheet can be made and the Decision Diagram can be used to obtain kinds of tasks for every failure mode from FMEA. Then time interval for Scheduled Discard

Task will be obtained by considering and calculating all the aspects of maintenance costs. Meanwhile the interval for Schedule-on Condition Task is half of its MTTF. The Table III below shows the results of the decision along with the results of the calculation interval.

TABLE III. PROPOSED TASK AND TIME INTERVAL

Component	Information Reference			Proposed	
	F	FF	FM	Task	Interval (hrs)
TB Upper Traverse Shaft Puller Side A	1	1.1	1	Discard	3123,32
		1.2	2	Discard	3170,43
			3	On-condition	1827,23
			4	Discard	3193,27
TBD Roll2 Puller Side A + B	2	2.1	1	Discard	3112,21
		2.2	2	Discard	3106,27
			3	On-condition	1363,65
			4	Discard	3228,53
TB Upper Shaft Take of Roll Puller Side A	3	3.1	1	Discard	1811,27
		3.2	2	Discard	1833,52
			3	On-condition	1023,46
			4	Discard	1844,28
TB Lower Shaft Take of Roll Puller Side A	4	4.1	1	Discard	5384,30
		4.2	2	Discard	5554,52
			3	On-condition	2195,03
			4	Discard	5639,07
TB Lower Shaft Take of Roll Puller Side B	5	5.1	1	Discard	1786,18
		5.2	2	Discard	1806,39
			3	On-condition	1464,14
			4	Discard	1816,13
TBD Roll3 Puller	6	6.1	1	Discard	3123,88
		6.2	2	Discard	3164,06
			3	On-condition	2760,32
			4	Discard	3183,47

### C. RBM Calculation

The company will obtain the risk value from machine failures when the maintenance crew is not doing the right preventive maintenance task as proposed by using the RCM. In this paper, the risk value is calculated by using the RBM method. The risk value is the result from the probability of machine failure times by the system performance loss for every downtime.

System performance loss is the total money loss caused by production loss when failure happens. In this research, the aspect of system performance loss are loss production during machine stop, engineer cost, material costs, and components cost. The Table IV below shows the result of system performance loss.

TABLE IV. SYSTEM PERFORMANCE LOSS

No	Component	System Performance Loss
1	TB Upper Traverse Shaft Puller Side A	IDR 49.223.648
2	TBD Roll2 Puller Side A + B	IDR 35.157.701
3	TB Upper Shaft Take of Roll Puller Side A	IDR 60.488.459
4	TB Lower Shaft Take of Roll Puller Side A	IDR 24.330.575
5	TB Lower Shaft Take of Roll Puller Side B	IDR 66.274.845
6	TBD Roll3 Puller	IDR 59.325.385

After that, the risk value of each component can be calculated and the total risk value can be identified. The risk value is the result of system performance loss times by the failure probability of each component. The calculation of the risk value and the total can be seen in Table V below.

TABLE V. SYSTEM PERFORMANCE LOSS

No	Component	System Performance Loss	Q(t)	Risk
1	TB Upper Traverse Shaft Puller Side A	IDR 49.223.648	0,884	IDR 43.532.369
2	TBD Roll2 Puller Side A + B	IDR 35.157.701	0,927	IDR 32.586.003
3	TB Upper Shaft Take of Roll Puller Side A	IDR 60.488.459	0,957	IDR 57.857.233
4	TB Lower Shaft Take of Roll Puller Side A	IDR 24.330.575	0,851	IDR 20.706.683
5	TB Lower Shaft Take of Roll Puller Side B	IDR 66.274.845	0,920	IDR 60.945.022
6	TBD Roll3 Puller	IDR 59.325.385	0,804	IDR 47.672.187
Total				IDR 263.299.498

### V. CONCLUSION

Based on the calculation and analysis using the RPN, the critical subsystem is gearbox. Therefore, in this research, the calculation and analysis are done only for the subsystem of gearbox. Based on the data calculation using the RCM method, there are 18 scheduled discard tasks and four scheduled on condition tasks for a critical subsystem of the

gearbox in Barmag FK6800 number 306. The time interval for every preventive task varies, depending on components, subcomponents, and its activity. The total cost of the proposed preventive maintenance is IDR 2.029.266.063 in a year, and the total cost of existing preventive maintenance is IDR 2.720.545.071 in a year. Therefore, if the company applied the proposed preventive maintenance, then the company could save IDR 691.279.008 a year. Based on the calculation using the RBM method if the company does not apply the proposed preventive maintenance, then the risk value would be IDR 269.768.775. This value is only taken from the critical subcomponent. Hopefully, this results of this research will contribute to studies in the field of maintenance engineering and applied maintenance policy. In the future, other researchers need to explore more methods for different machine types and the data can be expanded to optimize the analysis results.

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INTERNATIONAL CONFERENCE  
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*Fransiskus Tatas Dwi Atmaji*

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ON INDUSTRIAL, ENTERPRISE, AND SYSTEM ENGINEERING

28 NOVEMBER 2017

THE TRANS LUXURY HOTEL, BANDUNG, INDONESIA

A handwritten signature in black ink, appearing to read 'Irfan', is written over a blue 'ICoIESE' logo.

Dr. Irfan Darmawan  
Chair of ICoIESE 2017

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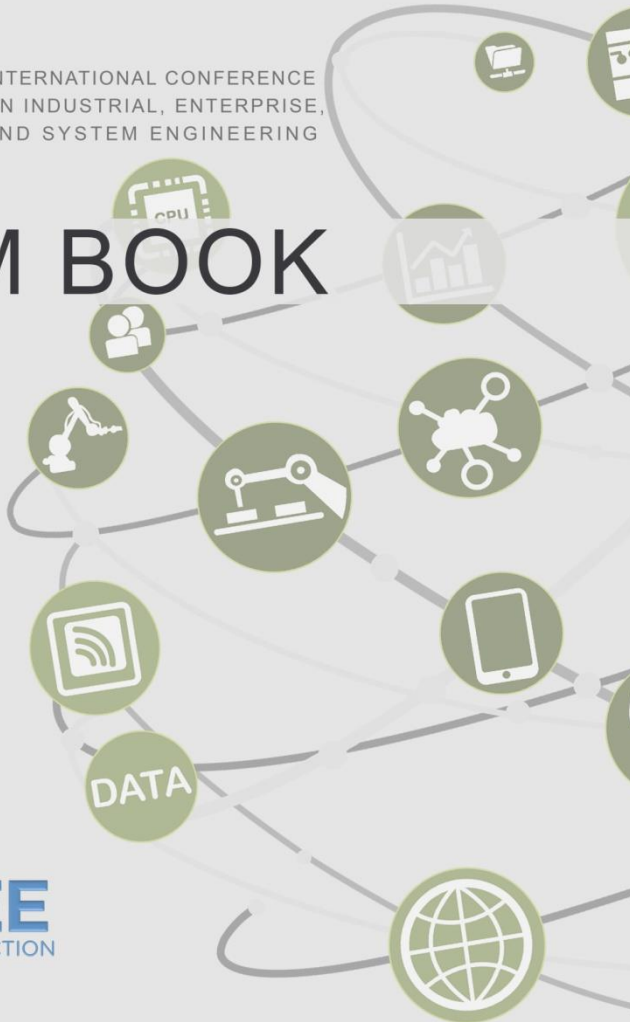
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# PROGRAM BOOK



THE 1<sup>ST</sup> INTERNATIONAL CONFERENCE  
ON INDUSTRIAL, ENTERPRISE,  
AND SYSTEM ENGINEERING

NOVEMBER 28<sup>th</sup>, 2017

THE TRANS LUXURY HOTEL, BANDUNG, INDONESIA

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## PREFACE

It is our privilege to welcome all presenters, participants, delegates, experts and scholars to the 1<sup>st</sup> International Conference on Industrial, Enterprise, and System Engineering (ICoESE-2017).

The support of enterprise application software (EAS) for day to day activities within one organization becomes crucial to the success of an organization. Enterprise Application Software (EAS) is computer software used to satisfy the needs of an organization rather than individual users. Such organizations would include industries, services, interest-based user groups, charities, or governments. New application developments have allowed organizations to not only improve the processes effectiveness and efficiencies for greater productivity, but have also provided businesses in order to cut costs, plan for the future, and maintain competitive advantage in the information era.

The 1st International Conference on Industrial, Enterprise, and System Engineering (ICoESE-2017) aims to bring together researchers, engineers and practitioners interested in the advances and business applications of information systems. Eight simultaneous tracks will be held, covering different aspects of Soft Computing and Data Mining, Information System, Software Engineering, Enterprise Architecture, Manufacturing System, Industrial and Supply Chain Management, Ergonomics and Human Factors, and Engineering Management. The tracks covered in ICoESE-2017 are expected to facilitate and drive innovative ideas for attaining better quality as well as solving real-world problems in enterprise.

This ICoESE-2017 is an activity organized by School of Industrial Engineering, Telkom University, Bandung, Indonesia. The conference co-technical sponsored by IEEE Indonesia Chapter. ICoESE-2017 held in conjunction with The IEEE Asia Pacific Conference on Wireless and Mobile 2017 (APWiMob-2017), organized and sponsored by the IEEE Communications Society Chapter Indonesia. Indeed, we are honored to host this event and would like to express our gratitude to authors which contribute to the numbers of accepted papers, which indicates a support from researchers throughout the globe.



The conference has attracted many local and international participants. We have received 105 submissions from 9 countries (including Indonesia, Malaysia, Germany, Poland, Taiwan, India, Japan, Pakistan, and The Netherlands). The ICoIESE-2017 conference also presented two special sessions:

1. Information Reduction Using Rough Set Theory and Conditional Entropy by Prof. Dr. Mustafa Mat. Deris from Universiti Tun Hussein Onn Malaysia and;
2. Born Global Innovation – Towards Sustainable, Collaborative Innovation Processes Across Borders by Prof. Dr. Jan Martin Pawlowski from Business Information Systems at the Ruhr West University of Applied Sciences and Research Professor at the University of Jyväskylä, Finland.

Each paper submitted was screened by the proceeding’s chairs and carefully peer-reviewed by 3 experts from Program Committee. Finally, only 46 papers with the highest quality and merit were accepted for oral presentation in this ICoIESE-2017 and will be submitted to IEEE.

IEEE Conference Record Number : #41400

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Finally, we would like to express my sincere gratitude to the IEEE Indonesia Section. My thanks also go to Dean of School of Industrial Engineering, Telkom University especially to all committees for their utmost and kind support in organizing our very First International Conference on Industrial, Enterprise, and System Engineering.

Lastly but not least, I would like to thank you all again for being here. I hope your experience at this event would be both beneficial and memorable.

I wish the conference will be a recurrent event and Enjoy to visit Bandung!

Chair of ICoIESE-2017  
 Dr. Irfan Darmawan





<b>PROGRAM</b>
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Time	Activity
08.00 AM	<b>REGISTRATION</b>
08.45 AM	<b>SAFETY CONDUCT</b>
09.00 AM	<b>OPENING CEREMONY</b>
09.10 AM	<b>CONFERENCE REPORT</b> Dr. Irfan Darmawan, Chair of ICoIESE-2017
09.20 AM	<b>OPENING REMARKS</b> Prof. Dr. Mochamad Ashari, Rector of Telkom University
09.30 AM	ART PERFORMANCE
09.50 AM	<b>KEYNOTE SPEECH-1</b> Prof. Dr. Mustafa Mat Deris from Universiti Tun Hussein Onn Malaysia
10.15 PM	<b>KEYNOTE SPEECH-2</b> Jan Martin Pawlowski from Business Information Systems at the Ruhr West University of Applied Sciences and Research Professor at the University of Jyväskylä, Finland
10.45 AM	<b>PARALLEL SESSION ANNOUNCEMENT</b>
11.00 AM	<b>PARALLEL SESSION 1</b>
12.30 PM	<b>LUNCH</b>
01.30 PM	<b>PARALLEL SESSION 2</b>
03.00 PM	<b>COFFEE BREAK</b>
03.30 PM	<b>PARALLEL SESSION 3</b>
07.00 PM	<b>CLOSING</b> Conference Gala Dinner, Best Paper Awards, Photo Session.



## KEYNOTE SPEAKERS



**Prof. Dr. Jan Martin Pawlowski**  
**Institute of Computer Science**  
**Ruhr West University of Applied Sciences**  
**Mülheim an der Ruhr, Germany**

**Title: Born Global Innovation – Towards Sustainable,  
 Collaborative Innovation Processes Across Borders**

Prof. Dr. Jan Martin Pawlowski is Professor in "Business Information Systems", Institute of Computer Science, Ruhr West University of Applied Sciences, Germany. Born in 1971, originally from Essen, Germany. Masters' Degree and Doctorate in Business Information Systems (University of Duisburg-Essen).

Before joining Ruhr West University of Applied Sciences, he was joined as Professor in "Digital Media", Department of Computer Science and Information Systems, University of Jyväskylä, Finland since December 2009. His specialization on "Global Information Systems". This includes the research coordination of several national and European projects. Main research interests and activities are in the field of Global Information Systems, E-Learning, Modelling Learning-related Processes, Procedural Models, Learning Technology Standardization, Quality Management and Quality Assurance for Education, and Mobile / Ambient Learning. Actively involved in research organizations (AACE, GI, IEEE) and in standardization organizations (DIN, CEN, ISO/ IEC JTC1 SC36).

**Abstract:**

How can we develop innovation in the global context? Can we find sustainable models for collaborative innovation across the globe? These are the key questions for researchers and practitioners in enterprises and universities. The presentation will shed light on current research trends and future challenges which can only be addressed on a global scale.

Innovation is a key to success of organizations and societies - different forms of innovation processes are suitable for different contexts such as frugal innovation for less developed countries. In most cases, researchers and product developers compete for new products and faster product lifecycles. However, innovation can be more fruitful for all, individuals, organizations and societies when executed in a collaborative way. As a starting point, the presentation proposes a new form of innovation: born-global innovation.

Born-global innovation describes a partly open innovation process which aims at parallel innovation processes in different countries and markets to increase time-to-market and outreach/scale of innovations. To successfully initiate these processes, trust building and idea creation is a key. The main barriers to born-global innovation as well as possible solutions and future research issues will be discussed.



**Prof. Dr. Mustafa Bin Mat Deris**  
**Faculty of Computer Science and IT**  
**Universiti Tun Hussein Onn Malaysia (UTHM)**  
**Johor, Malaysia**

**Title: Information Reduction Using Rough Set Theory and Conditional Entropy**

Mustafa Mat Deris received PhD from University Putra Malaysia in 2002. He is a professor of computer science in the Faculty of Computer Science and Information Technology, UTHM, Malaysia. He has successfully supervised six PhD students and currently he is supervising nine PhD students and published more than 170 papers in journals and conference proceedings. He has appointed as editorial board member for Journal of Next Generation Information Technology, JNIT, Korea, and Encyclopedia on Mobile Computing and Commerce, Idea Group, USA, Guest editor of International Journal of BioMedical Soft Computing and Human Science for Special Issue on “Soft Computing Methodologies and Its Applications” a reviewer of several international journals such as IEEE Transaction on Parallel and Distributed Computing, Journal of Parallel and Distributed Databases, Journal of Future Generation on Computer Systems, Elsevier, Journal of Cluster Computing, Kluwer, and Journal of Computer Mathematics, Taylor & Francis, UK.

He has served as a program committee member and co-organizer for numerous international conferences/workshops including Grid and Peer-to-Peer Computing, (GP2P 2005, 2006), Autonomic Distributed Data and Storage Systems Management (ADSM 2005, 2006,2007), and Grid Pervasive Computing Security, organizer for workshops on Rough and Soft Sets Theories and Applications (RSAA 2010), Fukuoka, Japan, and Soft Computing and Data Engineering (SCDE 2010, 2011), Korea.

His research interests include distributed databases, data grid, data mining and soft computing.

**Abstract:**

The growing size of data is a new challenge to discover knowledge in order to support the decision-making process. Another important reason is that, to find rules to support the process of data classification based on users' need is computationally intensive. With the growing of data the information size becomes growing elsewhere. However, some information comprises of redundant records/ elements that can be reduced in order to improve the efficiency of processing. Several techniques have been proposed to reduce records only but not both records and attributes. The classical rough set theory has been used in analyzing complete information systems, where all attribute values are available to all objects. With this capacity, the presentation would like to propose an approach by means of rough set theory for record reduction and conditional entropy for attribute reduction that can reduce the processing time, and at the same time does not jeopardize the accuracy of the decision process. Another important issue is that some information systems are incomplete where some attribute values are not available or missing. Subsequently, the attribute selection is one of the main problems in incomplete information systems. Only few studies were proposed for the attribute selection problem in incomplete information systems due to its complexities, specifically on attribute selection. Thus, this is another challenge in order to come out a new technique/approach that would be able to solve the issues.



**PARALLEL SESSION 1**  
**28 November 2017 – 11.00 AM**

**Chair : Amelia Kurniawati**  
**Room : Room 1**  
**Time : 11.00 AM – 12.30 PM**  
**Track : Engineering Management**  
**Manufacturing System**

Time	Title and Author
11.00 AM	Applying An Overlapped Design Schedule Based Dependency Structure Matrix to Minimize Project Makespan <i>Chao Ou-Yang and Indy Cesara</i>
11.15 AM	An Analysis of Core Competencies and Business Performance in Software SMEs : A Conceptual Framework <i>Atya Nur Aisha, Iman Sudirman, Joko Siswanto, Yassierli</i>
11.30 AM	Performance Appraisal Design Using 360 Degree Feedback at University X <i>Deniar Yudithama, Fida Nugraha and Devi Pratami</i>
11.45 AM	On the Relationship of Travel Time and Energy Efficiency of Industrial Robots <i>Kai Eggers, Zygimantas Ziaukas, Jens Kotlarski, and Tobias Ortmaier</i>
12.00 PM	Proposal of Maintenance Policy on Barmag FK6800 Machine in Yarn Company Using Reliability-Centered Maintenance and Risk-Based Maintenance Method <i>Irsalina Maharani, Fransiskus Tatas Dwi Atmaji, and Nopendri</i>



**Chair : Augustina Asih Rumanti**  
**Room : Room 2**  
**Time : 11.00 AM – 12.30 PM**  
**Track : Ergonomic and Human Factor**  
**Industrial System and Supply Chain Management**

Time	Title and Author
11.00 AM	Design of Teas Steering Stick At Milling Work Station Using User Centered Design Approach <i>Mira Rahayu</i>
11.15 AM	Design Tool for Tea Cutting Machine at PT Perkebunan Nusantara VIII to Reduce Musculoskeletal Disorders using Ergonomic Function Deployment (EFD) <i>Mira Rahayu and Muhamad Adhi Guna Dwyantoro</i>
11.30 AM	Behavior Proportion According to Merapi Volcano Eruption Evacuations in 2010 <i>Dwi Handayani, Bertha Maya Sopha, Budi Hartono, M. Kusumawan Herliansyah</i>
11.45 AM	Low Cost Electronic Seal for Tanker Truck in Indonesia <i>Ahmad Musnansyah and Bernando Arianto</i>
12.00 PM	S-ERP System: Sustainability Indicators Development <i>W.H. Wan Mahmood, Z. Ebrahim, M.S. Hasan, Z. Ebrahim, and M.N. Ab Rahman</i>



**Chair : Wojciech Macyna**  
**Room : Room 3**  
**Time : 11.00 AM – 12.30 PM**  
**Track : Information System**

Time	Title and Author
11.00 AM	Information System Planning for Emerging Start-up Company: A Case from Software House <i>Rayinda Pramuditya Soesanto, Wawan Tripiawan, Afrin Fauzya Rizana, Amelia Kurniawati and Fadillah Ramadhan</i>
11.15 AM	Web Application Design Based on Single Page Application to Increase Website Performance on Rumantara <i>Ilham Farobi, Soni Fajar Surya Gumilang and Muhammad Hasibuan</i>
11.30 AM	Web-based Food Delivery Management System (Focus to User Admin and Financial Organization Division) <i>Soni Fajar Surya Gumilang, Nia Ambarsari, and Mei Dina Isti Nurmala</i>
11.45 AM	Application of Risk IT Based on ISO 31000 Standards Process Capability Assessment Model Case Study: Andalas University <i>Mohammad Hafiz Hersyah and Kridanto Surendro</i>
12.00 PM	Information System Strategy and Application Governance in Bandung Government District <i>Heru Nugroho and Soni Fajar Surya Gemilang</i>
12.15 PM	Theoretical Lenses in Information Communication Technology for Development Research <i>Luthfi Ramadani</i>





**PARALLEL SESSION 2**  
**28 November 2017 – 01.30 PM**

**Chair : Ahmad Musnansyah**  
**Room : Room 1**  
**Time : 01.30 PM – 03.00 PM**  
**Track : Manufacturing System**

Time	Title and Author
01.30 PM	Proposed Designing Maintenance Policy Jet Dyeing Machine Using Life Cycle Cost (lcc) And Overall Equipment Effectiveness (oeo) In PT.XYZ <i>Akbar Perwira Wibowo, Fransiskus Tatas Dwi Atmaji and Endang Budiasih</i>
01.45 PM	Design of Automation System for Ceramic Surface Quality Control Using Artificial Neural Network At Balai Besar Keramik Puspita Ayu Lestari, Haris Rachmat, Mohd. Rasidi Ibrahim, and Denny Sukma Eka Atmaja
02.00 PM	Integrating Entropy and Taguchi Loss function for Accessing Waste Risk in Modified FMEA <i>Agung Sutrisno, Iwan Vanany, Indra Gunawan, and Mohammad Asjad</i>
02.15 PM	Optimizing Woven Fabric Defect Detection Using Image Processing and Fuzzy Logic Method at PT. Buana Intan Gemilang <i>Ratna Safitri and Tatang Mulyana</i>
02.30 PM	Inventory Control Policy for Farm Out Part on Overhaul Workscope at Cold Section Module CT 7 Engine with Periodic Review (R, s, S) and (R, S) <i>Pratya Suryadhini</i>
02.45 PM	Non-cooperative Solution on Government Subsidy Model for Public Transportation (Case Study Damri) <i>Yuza Bayuzetra and Hennie Husniah</i>



**Chair : Norisma Idris**  
**Room : Room 2**  
**Time : 01.30 PM – 03.00 PM**  
**Track : Soft Computing and Data Mining**

Time	Title and Author
01.30 PM	Flash-aware Clustered Index for Mobile Databases <i>Wojciech Macyna and Michal Kukowski</i>
01.45 PM	Latent Dirichlet Allocation modeling for CPS patent topic discovery <i>Usharani Hareesh Govindarajan, Amy Trappey and Gopal Kumar</i>
02.00 PM	Decisive Criteria on Financial Literacy Using Rough-Regression Model for University Students <i>Riswan Efendi, Mustafa Mat Deris and Susnaningsih Muat</i>
02.15 PM	Self-Adaptive Cyber Security System <i>Aradea Aradea, Iping Suwardi, Kridanto Surendro, Husni Mubarak and Irfan Darmawan</i>
02.30 PM	Self-Adaptive Load Balancing System for Grid Computing <i>Irfan Darmawan and Aradea Aradea</i>
02.45 PM	Clustering of User Query in Search engine on Indonesian E-Commerce by used AD-OPTICS Algorithms <i>Ranita Windriani, Ibnu Asror and Dana Sulisty Kusumo</i>



**Chair : Fakroul Ridzuan hashim**  
**Room : Room 3**  
**Time : 01.30 PM – 03.00 PM**  
**Track : Information System**

Time	Title and Author
01.30 PM	Extending the UTAUT model to understand the citizens' acceptance and use of electronic government in Developing Country: A structural equation modeling approach <i>Deden Witarsyah Jacob and Irfan Darmawan</i>
01.45 PM	Group-centered framework toward a positive design of digital collaboration in global settings <i>Irawan Nurhas, Jan M Pawlowski, Stefan Geisler, Maria Kovtunenko and Bayu Aditya</i>
02.00 PM	AcadEvent: Recommender System for Academic Events <i>Wan Siti Nur Aiza Wan Othman, Liyana Shuib, and Nur Baiti Afini Normadhi</i>
02.15 PM	Development of Project Document Management System based on Data Governance with DAMA International framework <i>Hanung Nindito Prasetyo, Regina Nathania Djepapu, Ferra Tridalestari, and Irman Hariman</i>
02.30 PM	Localized Island Model Genetic Algorithm in Population Diversity Preservation <i>Alfian Akbar Gozali and Shigeru Fujimura</i>
02.45 PM	Privacy Protection and Role of Technology: Citizen Perception on Electronic Voting Initiative <i>Muharman Lubis and Tien Fabrianti Kusumasari</i>



**PARALLEL SESSION 3**  
**28 November 2017 – 03.30 PM**

**Chair : Muhammad Azani Hasibuan**  
**Room : Room 2**  
**Time : 03.30 PM – 05.00 PM**  
**Track : Soft Computing and Data Mining**  
**Software Engineering**

<b>Time</b>	<b>Title and Author</b>
03.30 PM	Heart Abnormality Prediction Using MLP based Logsig Activation Function <i>Yulni Januar, Fakroul Ridzuan hashim, Muhamad Hadzren Mat, Anis Shahida Niza Mokhtar, Khairol Amali Ahmad, and Masrullizam Mat Ibrahim</i>
03.45 PM	Explicit and Implicit Aspect Extraction using Whale Optimization Algorithm and Hybrid Approach <i>Mohammad Tubishat and Norisma Idris</i>
04.00 AM	Analysis Opinion Mining With Combining Lexicon Based Method and Multinomial Naive Bayes <i>Geriska Isabelle, Warih Maharani and Ibnu Asror</i>
04.15 AM	A Comparison of Naïve Bayes and Bayesian Network on the Classification of Hijaiyah Pronunciation with Punctuation Letters <i>A Adiwijaya, Annisa Riyani and Mohamad Syahrul Mubarak</i>
04.30 PM	Model Tree with Modified L1 Loss Function for Predicting Missing Attendance Data of Faculties <i>Mohammad Arif Rasyidi and Rachmadita Andreswari</i>
04.45 PM	Cost-Based Storage of the R-tree Aggregated Values over Flash Memory <i>Wojciech Macyna and Krzysztof Majcher</i>
05.00 PM	Face Recognition Using Local Binary Pattern (LBP) and Local Enhancement (LE) Methods At Night Period <i>Abdurrahman F.I, Muhammad Nasrun, and Casi Setianingsih</i>



**Chair : Tien Fabrianti Kusumasari**  
**Room : Room 3**  
**Time : 03.30 PM – 05.00 PM**  
**Track : Information System**

Time	Title and Author
03.30 PM	Factors That Influence An Academic Institution's Intention To Accept CloudIOT: A Proposed Framework <i>Ali Ireda, Mohammed Awadh Ben- Mubarak, and Abudhahir</i>
03.45 PM	OLAP Cube Processing of Production Planning Real-life Event Log: A Case Study <i>Rachmadita Andreswari and Mohammad Arif Rasyidi</i>
04.00 AM	High Imperceptible Copyright Protection Adaptive Wavelet for Security <i>Irma Safitri</i>
04.15 AM	High Security Adaptive BCH Code Discrete Wavelet Transform Copyright Protection <i>Irma Safitri</i>
04.30 PM	Copyright Protection High Robustness Arnold Transform Wavelet Method <i>Bruguiera A. F. Agradriya, Irma Safitri, Ledya Novamizanti, and Muhammad Ainul Yaqin</i>





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Anies Fазiehan Zakaria	University Tun Hussein Onn Malaysia, Malaysia
Aleksander Zgrzywa Wroclaw	University of Science and Technology, Poland



**VISITING BANDUNG**

**Bandung** is the capital of West Java province in Indonesia and Indonesia's third largest city by population, with over 2.4 million, and Greater Bandung made up of 2 municipalities and 38 districts, making it the nation's 2nd largest metropolitan area with 6,965,655 inhabitants at the 2010 census. Located 768 metres (2,520 ft) above sea level, approximately 140 kilometres (87 miles) south east of Jakarta, Bandung has cooler temperatures year-round than most other Indonesian cities. This city is served by the Husein Sastranegara Airport. The city lies on a river basin surrounded by volcanic mountains. This topography provides a good natural defense system, which was the primary reason for the Dutch East Indies government's plan to move the colony capital from Batavia to Bandung.



**Transport**

Where are you come from? if you from several foreign country you can use airplane directly to Bandung's Hussein Sastranegara Airport or via Soekarno Hatta International Airport, Jakarta.

For land transport option, many way are available. Buses, trains, or by car. By land you can reach Bandung within 2 hours (estimated by 150kms direct highway) or faster from Jakarta.



Malaysia, Singapore, and several countries has regular flight to Bandung. Besides international flight, Bandung's airport serve flights to and from other major cities in Indonesia, like Jakarta, Surabaya, Semarang, Denpasar, Sampit.

To see train schedule to or from Bandung, try this useful link: <https://tiket.kereta-api.co.id/>.

### **Attraction**

Courtesy of: Bandung Tourism. <http://www.bandungtourism.com/todo.html>

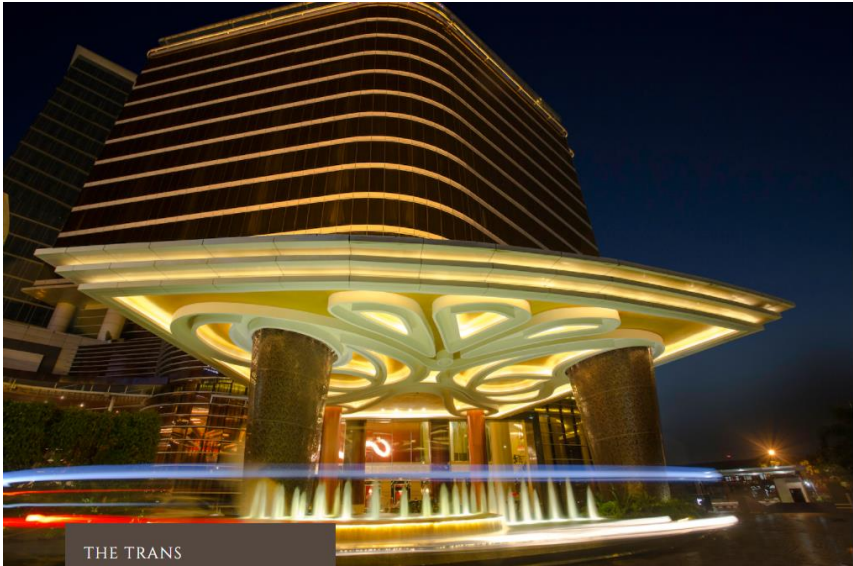
1. Amusement and Theme Park  
Bandung Tree top, Kampung Gajah, Rumah Sosis, Taman Ade Irma Suryani (Taman Lalu Lintas), Trans Studio Bandung.
2. Art Culture  
Angklung, Barongsai, Benjang, Calung, Celepungan, Cianjuran, Degung, Kacapian, Kasidahan, Pencak Silat, Reog, Saung Angklung Udjo, Wayang Golek
3. Mall And Shopping Center  
Bandung Indah Plaza, Bandung Trade Center, Braga City Walk, Carrefour, Cihampelas Walk, Festival CityLink, Bandung Electronic Centre, Istana Plaza, Paris Van Java, Pasar Baru Trade Center, Trans Studio Mall
4. Museum, Education, & Historical Architecture  
Bank Indonesia, Denis Bank Building, Gedung Sate Bandung, Gedung Tiga Warna, Gereja Katedral Santo Petrus, Jalan Braga, Kelenteng Satya Budhi, Mesjid Raya Bandung, Monumen Bandung Lautan Api, Monumen Perjuangan Rakyat Jawa Barat, Museum Barli, Museum Geologi, Museum Konferensi Asia Afrika, Museum Mandala Wangsit Siliwangi, Museum Pos, Museum Sri Baduga, Pura Agung Wira Loka NathaSundial, Villa Isola
5. Nature & Sightseeing  
Caringin Tilu Ciater, Curug Dago, Curug Omas, Gelanggang Renang Karang Setra, Goa Belanda, Goa Jepang, Kampung Wisata Pasir Kunci, Kawah Domas, Kawah Putih, Kebun Bunga Cihideung, Objek Wisata Punclut, Situ Ciburuy, Situ Cileunca, Situ Patengan, Taman Hutan Raya Ir. H. Djuanda (Dago Pakar), Tangkuban Perahu.



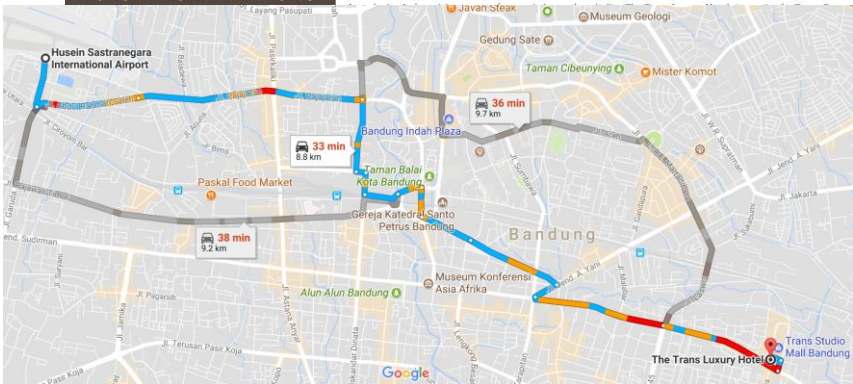
**CONFERENCE VENUE**

**THE TRANS LUXURY HOTEL**

Jl. Jendral Gatot Subroto No.289, Cibangkong, Batununggal,  
Bandung City, West Java 40273



THE TRANS LUXURY HOTEL BANDUNG





Introducing Indonesia's newest reference in luxury hospitality, The Trans Luxury Hotel, Bandung, Indonesia.



A creation by Trans Corporation, it is a sophisticated blend of Indonesian tradition with a refined contemporary interpretation, right in the heart of Bandung City.

All the facilities and services at The Trans Luxury Hotel have been designed to set the property in a class of its own. The panoramic restaurant and lounge on level 18 with sweeping views of the city, the open-air sandy beach pool with sun lounges, the elegant day spa, the high tech fitness centre, the luxurious room amenities, all ensure the most memorable stay for an extraordinary escape or at a successful, impeccable run event.

**Facilities:**

Premier Room, Premier Club Room, The Club Lounge, Celebrity Suite, Presidential Suite.

Swimming Pool, Kids Club, Arsa-100% Charity Shop, Spa, Fitness Centre, Trans Studi Bandung, Trans Studio Mall.

**Alternative hotel near The Trans Luxury Hotel:**

ibis Bandung Trans Studio, located next to The Trans Luxury Hotel.

## VISA INFORMATION

Courtesy of Bandung Tourism

<http://www.bandungtourism.com/gethere.php>

Tourist visas are only intended for tourists who are visiting Indonesia, *not for expatriates intending to work and live for an extended period of time*. Tourist visas will be needed by friends or family coming to visit you during your stay in Indonesia. There are 3 categories of tourist visa system.

**Pay-for-visa-on-arrival (VOA) system for citizens of 52 nations, this are the following:**

Argentina, Australia, Austria, Bahrain, Belgium, Brazil, Bulgaria, Cambodia, Canada, Cyprus, Denmark, Egypt, Estonia, Finland, France, Germany, Greece, Hungary, iceland, India, Iran, Ireland, Italy, Japan, Kuwait, Laos, Liechtenstein, Luxembourg, Maldives, Malta, Mexico, Monaco, the Netherlands, New Zealand, Norway, Oman, People's Republic of China, Poland, Portugal, Qatar, Russia, Saudi Arabia, South Africa, South Korea, Spain, Switzerland, Sweden, Suriname, Taiwan, United Arab Emirates, United Kingdom, and the United States.

The cost of the 30-day (only) tourist visa is US\$25/person for a 30-day visa and US\$10/person for a 3-day visa.

Visitors from countries with visa-on-arrival facility will have to go to a special counter to have their passports stamped with the on-arrival visa before going to the immigration clearance desk. The VOA visa is NOT EXTENDABLE OR RENEWABLE. A visa issued on arrival can be extended only in extraordinary circumstances such as natural disasters, accident, or illness. If you want to stay in Indonesia longer than the 30 days you must exit and re-enter the country on a new tourist visa.

Visa purchasing takes 15-30 minutes per applicant, depending on the number of persons applying. Payment counters, a bank counter, and a money changer have been set up to process payments. Passport must be valid for at least six months from the date of arrival. Payment must be made on arrival. An onward or return trip ticket must be shown on arrival.



**The visa on arrival facility is only available at the following international gateways:**

**Airports:**

Medan, Pekanbaru, Padang, Jakarta, Surabaya, Bali, Manado, Halim Perdana Kusuma in Jakarta, Adisucipto in Yogyakarta, Adisumarmo in Solo, Selaparang in Mataram, Lombok, Sepinggán in Balikpapan, Kalimantan, Hasanuddín in Makassar, Sulawesi, and Eltari in Kupang, Timor.

**Seaports:**

Batam, Tanjung Uban (Bintan), Belawan (Medan), Sibolga (Sumatra), Dumai, Teluk Bayar (Padang, Sumatra), Padang Bai (Bali), and Jayapura (Papua), Teluk Bayar in (Padang, Sumatra), Bitung, Tanjung Balaikarimun, Tanjung Mas (Semarang), Tenau (Kupang), Pare Pare (Sulawesi), Bintang Pura (Tanjung Pinang), and Soekarno-Hatta (Makassar, Sulawesi)

Visa-free facility is granted to the citizens of 11 countries whose governments extend visa free facility to Indonesian nationals would continue to enjoy short visa-free stays.

**Included in the 11 countries and administrative districts that are granted the 30-day visa-free facility are:**

Brunei Darussalam, Chile, Hongkong Special Administrative Region, Macau Special Administrative Region, Malaysia, Morocco, Peru, the Philippines, Singapore, Thailand, and Vietnam.

Visitors with the visa-free facility will be able to proceed directly to the immigration clearance counter after deplaning. Passport must be valid for a minimum of six months from the date of arrival. Onward or return tickets must be shown on arrival.

Citizens of other countries not on the visa on arrival or visa free lists will be required to apply for a visa overseas (in their home country) before entering Indonesia.

Citizens of any country wishing to stay more than 30 days must also apply for an appropriate visa (cultural visit or business) at their nearest Indonesian Embassy or Consulate before traveling to Indonesia.

Tour Agents are able to arrange express handling for groups at no additional charge by presenting the completed immigration cards, passports and



applicable visa fee. Passengers who overstay their visa period for a short period of time can be processed immediately at the airport by paying US\$ 20 for every day they overstayed their 30-day visa. Airlines that experience technical difficulties or delayed flights can apply for their passengers to be exempted from paying any overstay penalties.

The current tourist visa policy cuts the length of stay for tourist visas from the previous 60 days to 30 days. It is NO LONGER possible to stay in Indonesia more than 30 days on a tourist visa.

(30-day counting)

The way they immigration officials count the 30-day period is: you arrive on the 1st day with, for instance, a 30-day visa, and you must leave on the 30th day (not the 31st or the first of the next month, as you might think). This is actually their policy for how to count the days. and, after getting burned once and learning my lesson, I see their point and follow their definition of 30 days. If you want to stay in Indonesia LONGER than 30 days, you must leave the country and re-enter on a new tourist visa. People commonly fly to Singapore or Timor for this. There is no stipulation on the time you must stay outside Indonesia, in fact, you can return the same day if you want and be issued a new visa upon your arrival in Indonesia.

### **Overstaying your Visa**

Overstaying a tourist visa (or any visa) is a serious offense in Indonesia. You will be blacklisted (can not enter Indonesia again for a year or more) and fined \$20-30/day for every day you overstayed your visa and then deported once you have paid the fine. The maximum fine for overstaying a visa (more than 60 days) is Rp 25 million and 5 years in jail. You will be kept at the immigration quarantine until you have paid the fee and/or the decision has been made to deport you. Please take this seriously as this is not one of those problems that you can easily bribe your way out of.

### **To Prepared**

Please pay attention for government rules of Indonesia. Get your visa and passport if you are from another country. For visa policy, you can see from link "visa policy to indonesia".





**ADDITIONAL INFORMATION**

**Currency**

The official currency in Indonesia is Rupiah. The currency code for Rupiah is IDR and the currency symbol is Rp.

**Language**

The official language for the conference is English.

**Electricity & Plug**

In Indonesia, electricity is supplied in 220 – 240 Volts, 50 Hz. The electrical outlet has two round holes, similar to those in continental Europe.



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