"INDUSTRIAL CHALLENGE 2018"

THE 9th Industrial Challenge

MODULE INCHALL 2018

HIMPUNAN MAHASISWA TEKNIK INDUSTRI
INSTITUT TEKNOLOGI SEPULUH NOPEMBER, SURABAYA

www.iefair-its.com/inchall

INDUSTRIAL CHALLENGE

Industrial Challenge (INCHALL) is a competition regarding Industrial and System Engineering competence among universities held by Himpunan Mahasiswa Teknik Industri (HMTI), Industrial Engineering Department, Institut Teknologi Sepuluh Nopember. The competition is made for several purposes, such as applying the core competences of Industrial Engineering knowledge, developing student's ability to solve industrial problems, improving ability to design and engineer the elements that affect industrial system as a preparation for working environment, and supporting knowledge and insight exchange among the participants of the competition.

The main topic that will be brought on INCHALL 2018 is Global Production Network : Realizing the Potential. The topic will discuss about the overall company capabilities for creating products that have a

high value so that it worth to be delivered to all the market across the country.

THEME:

GLOBAL PRODUCTION NETWORK: REALIZING THE POTENTIAL

Delivering products across the nation is a critical thing nowadays for a firm to be able to compete in certain industry. The things that considered as impossible five to ten years ago has become common things so the firm be able to survive in the business. To be able to compete in the international level, determining strategy from many aspects of a firm are important

Global Production Networks (GPNs) are accounting for various aspect within the firm that need to have special concerned such as manufacturing activity, distribution management, strategy formulation, etc. The development of industrial activities has been going

through immense progress. High quality product, efficient logistic strategy, effective strategy management and monitoring, are several from uncountable aspect that determining a firm to be able to compete in global level or not. Beside concerning the aspect that within the firm, aspect such global economic and policies around the world is also another things that a firm have to either taken advantage of and mitigate the uncertainty that is coming from external factors. The term globalization implies many issues depending on the perspective considered. Thus, Global Production Network are a major factor to account for their dynamics and be able to turn it into firm's opportunity to increase their value to the market. According to Dr. Jean-Paul Rodriguez (2006) Global production networks have various configurations depending on the nature of their production and the markets they service. The term GPN itself is semantically very revealing (Rodrigue, 2006):

- **Global**. Refers to the underlying geography of the global economy. It considers space as a facilitator of economic efficiency, notably in terms of comparative advantages, but also as a constraint in terms of distance and market fragmentation. It expresses the locational reality of the global economy with differences in input costs and market potential.
- **Production**. Refers to the variety of activities involved in the creation and transformation of resources, parts and final products. It expresses the value generation reality, both for goods and services, of the global economy with differences in manufacturing capabilities.
- **Networks**. Refer to the complex web of interactions, both physical and immaterial (information), of production and its underlying logistics. It expresses the transactional and

distribution reality of the global economy with differences in the efficiency of freight distribution.

Even though many references have emphasize that the GPN are the matters of logistics and transportation role in industry. This year theme want to broaden the discussion into various aspects from a firm into what are the capabilities within the firm that need to be considered as critical factors for the firm to be able for going global.

PARTICIPANT AND SCHEDULE

General Requirement

- Each team consists of three people and their membership in the team could not be changed in the future for any particular reason.
- Each member of the team must be registered as undergraduate student (S1) of Industrial Engineering Department or related major from the same university.*
- Each member of the team must be listed as an active student until March 31st 2018

*Any related major must covers minimum 3 of the INCHALL Competences

Registration Procedure

- Each team must register for an account at www.iefair-its.com/inchall. Account will be made by fulfilling the registration and requirements, such as photo and student card of each member of the team.

- The Online Registration will be charged USD 15 for international participants and IDR 200,000 for national participants. The participants must upload payment slip to complete the requirements. The payments should be transferred to:

  BNI Account

  In the Name of : Evita Nuriya Rosada

  Account Number : 0470991436

- After registration process done, the participants will get an activation email.
- When the activation is done, the participants will get additional menu in the website titled Team Page that consists of content to join preliminary stage.
- Registration will be opened from November 27th 2017 to January 6th 2018.

Preliminary Stage

Preliminary stage in INCHALL 2018 is testing the participant's knowledge about Industrial Engineering

Science through Online Competition. In this stage every participant that has been registered will get account to join the Online Test through Team Page menu.

The Top 15 teams will continue to Final Stage in Surabaya.

Re-Registration

Every team who has been announced as semifinalist of INCHALL 2018 must do re-registration. The Re-registration due date is at February 24th 2018 and requires every team to prepare some documents below:

- Data forms of each participant
- Payments slip of registration fee
- Certificate of Active Student

Each document should be sent by softcopy form .zip/.rar format, with subject and filename format **team name_name of university** and sent to industrialchallengeITS@gmail.com.

For this Re-registration procedure each team needs to pay Registration Fee of USD 250 for the international participant and IDR 3,000,000 for the national participants. The payments should be transferred to:

BNI Account
In the Name of : Evita Nuriya Rosada
Account Number : 0470991436

Semifinal Stage

Semifinal stage is stage that be held after online test. 15 best teams from all teams in online test will continue this competition to semifinal stage. Semifinal stage will be held at Institut Teknologi Sepuluh Nopember (ITS) Surabaya, Indonesia in February 27th2018 until March 3rd 2018. Semifinal stage will consist of 1st stage and 2nd stage. In this stage, participant must have communication skill, analytic skill, and courage to make decision about industrial engineering science. Committee

will provide accommodation and transportation during competition in Surabaya. The further information will be announced by committee through official website.

Stage 1

Amazing Race is the first stage that will be held for all semifinalist teams of INCHALL 2018. In this stage, every team will have to solve the problem that science based industrial engineering courses including ergonomics and design work system, manufacturing system, system development and management of industrial, computation and optimization industry and also logistics and supply chain management. Every team must solve the problem during certain duration. The further information will be announced by committee through official website.

Stage 2 :

This stage will challenge the semifinalist through simulation game. Every team will undergo a production

and distribution simulation to implement related Industrial Engineering courses. Every team has to set the best strategy and make decision based on the condition that is given in every period. There will be only five teams which are selected to go to the next stage. The further information will be announced by committee through official website.

Grand Final

Grand final stage is the last stage of INCHALL 2018. Best five teams from elimination stage may solve the Case Study which goal is to solve problems related to the theme. We expect each team to give a feasible recommendation in solving the problem. The biggest challenge in this stage is that the participant needs to have broad insights of what is it really happening in Indonesia right now and using Industrial Engineering competences as tools to help solving it. The best team with best performance and feasible solution will be the winner of

INCHALL 2018. Put your game face on and get ready to compete!

PRIZE

1st place	: USD 1400
2nd place	: USD 950
3rd place	: USD 600
4th place	: USD 300
5th place	: USD 250

TIMELINE

- **Online Registration**
  November 27th 2017-January 6th 2018
- **Preliminary Schedule**
  January 12th 2018
- **Preliminary Stage**
  January 22nd-29th 2018
- **Semifinalist Announcement**
  February 4th 2018
- **Re-Registration**
  February 5th-24th 2018
- **Semifinal and Grand Final Stage**
  February 27th 2018-March 3rd 2018

Syllabus

ERGONOMICS AND WORK SYSTEM DESIGN COMPETENCES					
Ergo Safety	**Facilities Design**	**Methods Study & Work Measurement**	**Industrial Ergonomy**	**Human Reliability**	**Product Design & Development**
• Human Factors Theory in Accidents • Human-Personal Errors • Safety Statistics and Analysis • HSE Management • Quantitative and Qualitative Safety Analysis Tools	• Plant Design & Location • Capacity Analysis • Material Flow Evaluation Methods • Qualitative & Quantitative Optimization Methods • Capacity Design	• Work Operations Analysis • Job Design & Analysis • Human Machine System • Stop Watch Time Study • Work Sampling • Method Time Measurement	• Biomechanics • Anthropometry • Cognitive Ergonomics • Energy Costs of Work • Manual Handling & Back Safety	• Human Information Processing • Human Factors & Supervisory Control • Function & Task Analysis • Learning Curve • Human Reliability Assessment	• Quality Function Deployment • Design for Manufacturing & Assembly • Concept Generation & Selection • Product Specification

MANUFACTURING SYSTEM COMPETENCES

Maintenance & ReliabilityEngineering	Quality control engineering	Manufacturing System	Productivity Analysis	Six Sigma
• Maintenance Strategy • Reliability and Hazard Fuction • System Reliability • Maintenance Scheduling • Inspection Policy • Failure Prediction • Repairable & Non repairable • Complex System • Warranty	• Introduction of Quality • Statistical Process Control • Variable and Atributte Control Chart • Acceptance Sampling • Capability Process • Design of Experiment • Advance Technology in Quality Inspection	• Introduction of Manufacturing System • Production Layout • Material Handling and Storage System • Automatic Data Capture • Assembly and Disassembly • Quality Inspection and Packaging • Process Planning and Concurrent Engineering • Kanban System • Toyota Production System	Productivity Cycle • Total Productivity Model • Objective Matrix • Lean Manufacturing • Green Productivity	• Perspective and Tools Six Sigma • International Quality Standart • Startegic Quality Planning • Voice of Market • Voice of Customer • Quality and Innovation in Product and Process Design • Design Quality Product and Service • Lean Six Sigma • Lean Six Sigma for Supply Chain

QUANTITAVE MODELLING AND INDUSTRIAL POLICY ANALYSIS COMPETENCES				
Operational Reseacrh	Industrial Statistics	Industrial System and Simulation	Decision Analysis	System Dynamic
• Optimization Mathematics • Linear Progamming • Goal Programming • Dynamic Programming • Markov Chain • Game Theory • Duality Theory • Sensitvity Analysis	• IndustriaStatistics • Descriptive Statistic • Probability • Discrete & Continuous Probability Distribution • Hypotesis Testing • ANOVA • Regression • Non-parametric Statistic • Data Mining	• Discrete Event Simulation • Input and Output Analysis • Comparing System and Scenario	• Modelling Decision Structure • Decision Making Technique • Uncertainty in Modelling Decision Technique • Modelling Preferences • Mulit-Criteria Decision Making	• Continuos Simulation • Causal-loop Diagram • Flow Diagram

LOGISTIC AND SUPPLY CHAIN MANAGEMENT COMPETENCES				
Production Planning and Control	**Logistics Management**	**Supply Chain Management**	**Distribution Management**	**Procurement and Material Management**
• Demand Forecasting • Aggregate Planning • Master Production Schedule • Material Requirement Planning • Inventory and Capacity Planning • Production Activity Control	• Logistic Strategy • Customer Service and Order Processing in Logistic • Inventory Service Level • Logistics Network Design • Transportation and Distribution • Warehousing • Outsourcing and Global Logistic • Pareto's Law	• Supply Chain Strategies • Coordinated Product and Supply Chain Design • Network Configuration • Demand Management • Measuring Supply Chain Performance	• Distribution Network Design Problems • Location-Allocation Decision Problems • Facilities Locations Problems	• Discrete Demand System • Distribution Inventory System

INDUSTRIAL SYSTEM AND MANAGEMENT DEVELOPMENT COMPETENCES					
Engineerng Economic	**Project Management**	**Organization and Human Resource Management**	**Risk Management**	**Financial Management**	**Perfomance Management**
• Economic Analysis of Alternatives • Accounting, Depreciation and Income Taxes • Interest Formulas and Equivalence • Time Value of Money	• Projecting Time and Cosy • Schedulling Resource and Cost • Project Perfomance Analysis	• Human Resource Management • Organizational Design and Organizational Structure	• Risk Concept, Types and Analysis • Quantitative Methods ti Identify and Assess Risk	• Cash Flow and Taxes • Financial Ratio • Financial Forecasting, Planning and Budgeting • Risk and Rate of Returm	• Company Perfomance Management • Perfomance Management Framework • Key Perfomance Indicator • Employee Perfomance Management

COMMITTEE CONTACT:

If you have any question about INCHALL 2018, please do not hesitate to contact us in these numbers:

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P.S : Any changes of the schedule, requirement, and regulation above will immediately announced through our website www.iefair-its.com/inchall and/or emailed to all other participants