Proceeding
The 5th International Seminar on Industrial Engineering and Management (5th ISIEM)

Aston Hotel, Manado, Indonesia
February 14th – 16th, 2012

Organized by:
Industrial Engineering Department of

Sponsored by:

Supported by:
Indonesian Industrial Engineering Higher Education Association
FOREWORD

This issue is published in line with the Fifth International Seminar on Industrial Engineering and Management (5th ISIEM). The theme to this seminar is “Innovation in Technology, Information, and Management Concerning Worldwide Economic Challenge”. The articles cover a broad spectrum of topics including Quality Engineering and Management, Supply Chain Management, Operation Research, Decision Support System and Artificial Intelligence, Production System, Industrial management, and Ergonomics. The articles provide an overview of critical research issues reflecting past achievements and future challenges.

Full papers were reviewed by peer reviewers and finally we published 80 titles. This issue and seminar become special as more delegates come and join from various country as well as universities. We host 77 delegates both from abroad and local.

First and second ISIEM are hosted only by three universities, namely Trisakti, Esa Unggul and Gunadarma Universities. This year event, it’s hosted by seven universities, i.e. Atma Jaya Catholic University of Indonesia, Trisakti University, Esa Unggul University, Pasundan University, Al-Azhar Indonesia University, Tarumanagara University, and last but not least, De La Salle Manado University.

In this occasion, let us give special thank to Mr Marcus Pitt, President Director PT SOHO Industries, and Assoc. Prof. Dr. Chuvej Chansa-ngavej, Director, SIU Research Center Program Director - PhD in Management Science, School of Management Shinawatra University (SIU International), Thailand. Your contribution to this seminar as reviewers and as keynote speakers makes this event more valuable. We are also grateful to all reviewers, for their commitment, effort and dedication in undertaking the task of reviewing all of the abstracts and full paper. Without their help and dedication, It would not be possible to produce this proceeding in such a short time frame.

We want to thank all those who submitted papers for review and those whose papers were chosen for presentation at the seminar and those who submitted manuscripts to be published in this proceeding. We highly appreciate all members of committee director, steering committee and organizing committee for mutual efforts and invaluable contributions for the success of the seminar.

Finally, have intensive discussion in this seminar and enjoyable stay in Manado.

Vivi Triyanti ST. M.Sc
(Atma Jaya Catholic University of Indonesia)

Chair of Committee
COMMITTEE

Steering Committee
1. Iphov Kumala Sriwana, ST, M.Si (Esa Unggul University)
2. Parwadi Moengin, PhD (Trisakti University)
3. Vivi Triyanti, S.T., M.Sc (Atma Jaya Jakarta Catholic University)
4. Ir. Syarif Hidayat, MM, MEng, Sc (Al Azhar Indonesia University)
5. Dr. Ir. Chevy Herli Sumeri A, MT (Pasundan University)
6. Lamto Widodo ST. MT (Tarumanagara University)

Organizing Committee
Chair Vivi Triyanti, ST, M.Sc. (Atma Jaya Jakarta Catholic University)
Co-Chair Ir. Triwulandari SD, MM (Trisakti University)
Secretary Lamto Widodo ST. MT (Tarumanagara University)
Treasury Iphov Kumala Sriwana, S.T., M.Si (Esa Unggul University)
Proceeding Editor Rahmi Maulidya, ST, MT (Trisakti University)
Marcellinus Bachtiar ST., MM (Atma Jaya Jakarta Catholic University)
Feliks Prasepta, ST., MT. (Atma Jaya Jakarta Catholic University)
Leaflet Ir. Nofi Erni, M.M. (Esa Unggul University)
Adianto (Tarumanagara University)
Sponsorship Rina Fitriana, S.T., M.M. (Trisakti University, INDONESIA)

Operational (Preparation for the event)
Nunung Nurhasanah, ST, MT (Al Azhar Indonesia University)
Ir. Syarif Hidayat, MEng, MM (Al Azhar Indonesia University)
Lina Gozali (Tarumanagara University)
Endro (Tarumanagara University)
Riya (Esa Unggul University)

Operational (On the event)
Ahmad Juang Pratama, ST., MSc. (Al Azhar Indonesia University)
Ahmad Chirzun, ST., MT. (Al Azhar Indonesia University)
Ir. Yogi Yogaswara, MT. (Pasundan University)
Dr. Ir. H. Chevy Herli SA., MT. (Pasundan University)
Dr. Ir. Hj. Tjutju T. Dimyati, MSIE. (Pasundan University)
Ir. Noldi Watuna, MM (Unika De La Salle Manado)
Debby Paseru, ST, MMSI, M.Ed (Unika De La Salle Manado)
Ronald Rachmadi, ST, MT (Unika De La Salle Manado)
Mario Vitores, ST (Unika De La Salle Manado)

Website
Ir. Wahyukaton, MT. (Pasundan University)
REVIEWER

1. Prof. Ir. I Nyoman Pujawan, MEng, PhD  
   (Sepuluh Nopember Institute of Technology, INDONESIA)

2. Assoc.Prof. Dr. Chuvej Chansa-ngavej  
   Director, SIU Research Center, Program Director - PhD in Management  
   Science, School of Management Shinawatra University (SIU International),  
   THAILAND

3. Dr. Ferry Jie  
   (RMIT University Melbourne, AUSTRALIA)

4. Dr. Parwadi Moengin  
   (Trisakti University, INDONESIA)

5. Ir. Triwulandari SD, M.M.  
   (Trisakti University)

6. Dr. Ir. Lily Amelia, M.Agr., M.M.  
   (Esa Unggul University, INDONESIA)

7. Ir. Nofi Erni, M.M.  
   (Esa Unggul University, INDONESIA)

8. Prof. Dr. Hadi Sutanto  
   (Atma Jaya Jakarta Catholic University, INDONESIA)

9. Prof. Dr. Weggie Ruslan  
   (Atma Jaya Jakarta Catholic University, INDONESIA)

10. Prof. Dr. Ir. S. Sardy, M.Eng.Sc  
    (Al Azhar Indonesia University, INDONESIA)

11. Dr. Ir. Tjutju Tarliah Dimyati, MSIE  
    (Pasundan University, INDONESIA)

12. Lamto Widodo ST. MT  
    (Tarumanagara University, INDONESIA)