



6th International
Symposium on
Industrial Engineering

24-25th
SEPTEMBER
2015

FACULTY OF MECHANICAL
ENGINEERING

STEINBEIS ADVANCED
RISK TECHNOLOGIES

INNOVATION CENTER FME



Venue details: Faculty of Mechanical Engineering, University of Belgrade, Kraljice Marije 16,
11000 Belgrade, <http://www.mas.bg.ac.rs/eng/start>

SIE 2015 AGENDA

Agenda Subject to Change

Thursday, September 24, 2015

- 9.30-11h Registration of participants, room 211, 2nd floor
- 11-12h Opening remarks, room 211, 2nd floor
- 12-13h Welcome cocktail, Business club, FME, 5th floor
- 13-16h Plenary Session, room 513, 5th floor
- 16-18.30h Session A, room 513, 5th floor
- 16-18.30h Session B, room 514, 5th floor
- 19-23.30h Conference dinner, Business club, FME, 5th floor

Friday, September 25, 2015

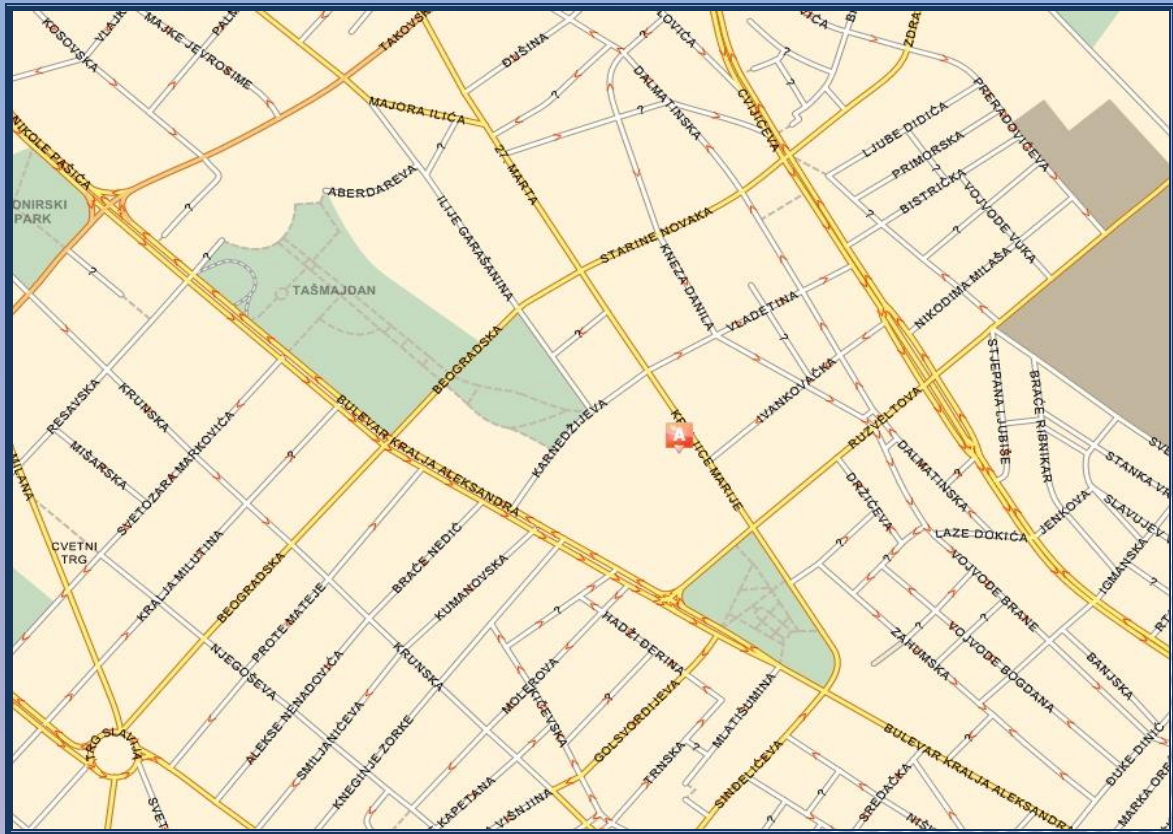
- 10-13h Session C, room 513, 5th floor
- 10-13h Session D, room 514, 5th floor
- 13-13.30h Coffee Break, room 210, 2nd floor
- 13.30-15h Round table “*Scalability in manufacturing systems design and operation and a roadmap to create impact on economic and social sustainability*“, room 513, 5th floor
- 15-17.30h Session E, room 513, 5th floor
- 15-17.30h Session F, room 514, 5th floor
- 18-23h Sightseeing and dinner for invited participants

Symposium office: room 513, 5th floor

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OPENING REMARKS

Dr Srđan Verbić, Minister of Education, Science and Technological Development
Republic of Serbia

Dr Bojan Babić, President of Faculty Council, Faculty of Mechanical Engineering,
University of Belgrade, Republic of Serbia

Dr Milorad Milovančević, Dean, Faculty of Mechanical Engineering, University of
Belgrade, Republic of Serbia

Mr Michael Löscher, Steinbeis Advanced Risk Technologies, Stuttgart, Germany

Mr Mihailo Vesović, Head of the Center for Innovation, Chamber of Commerce and
Industry of Serbia, Republic of Serbia

PLENARY SESSION - CHAIRPERSONS: Maria Francesca Milazzo, John Weiss, Paolo Bragatto, Michael Löscher, Goran Putnik

1. *Maria Francesca Milazzo*
EFFECTS OF MANAGEMENT AND ORGANISATIONAL VARIABLES IN RISK ASSESSMENT
2. *John Weiss*
COST BENEFIT ANALYSIS AND DEVELOPMENT BANKS
3. *Paolo Bragatto, Patrizia Agnello, Silvia Ansaldi, Emanuele Artenio, Corrado Delle Site*
REVIVING KNOWLEDGE ON EQUIPMENT FAILURES AND IMPROVING RISK MANAGEMENT AT INDUSTRIAL SITES
4. *Aleksandar Jovanovic, Michael Löscher, Flor Angela Quintero*
SAFE AND SUSTAINABLE INNOVATION IN GERMANY - THE STEINBEIS APPROACH
5. *Goran Putnik*
EDUCATION 3.0 AND SOCIAL NETWORK-BASED EDUCATION FOR EFFECTIVE LEARNING AND INTEGRATION WITH INDUSTRY
6. *Teodora Rutar Shuman, Gregory S. Mason, Yen-Lin Han, Kathleen E. Cook*
FACILITATING PROBLEM-BASED LEARNING WITH AN INVERTED CLASSROOM

SESSION A - CHAIRPERSONS: Maria Francesca Milazzo, Vesna Spasojevic Brkić, Srdjan Vulcanović

7. *Maria Francesca Milazzo, Giuseppa Ancione, Vesna Spasojević Brkić*
SAFETY IN CRANE OPERATIONS: AN OVERVIEW ON CRANE-RELATED ACCIDENTS
8. *Zorica Veljković, Vesna Spasojević Brkić, Aleksandar Brkić*
CRANE CABINS' SAFETY AND ERGONOMICS CHARACTERISTICS EVALUATION BASED ON SWEDEN PORT DATA
9. *Sanja Mandić*

RISK MEASURING WITH RISK ANALYSIS AND RESPOND TOOLS

10. *Srđan Vulanović, Vojislav Vulanović, Vladan Radlovački, Milan Delić*

RISK BASED AUDIT OF MANAGEMENT SYSTEMS

11. *Emina Džindo, Uroš Lukić*

RISK BASED INSPECTION PLANNING AND INSPECTION RESULTS EVALUATION

12. *Jasna Markovic-Petrovic, Mirjana Stojanovic*

A HYBRID SECURITY RISK ASSESSMENT METHOD FOR SCADA NETWORKS

13. *Dorđe Mitrović, Sonja Josipović*

AFFORDABILITY OF EMERGING TECHNOLOGIES – CASE OF BROADBAND ADOPTION IN WESTERN BALKAN COUNTRIES

14. *Branislav Stevanov, Zdravko Tešić, Sanja Bojić, Milosav Georgijević*

INTEGRATING PORT EQUIPMENT MAINTENANCE PROCESS INTO PORT MANAGEMENT INFORMATION SYSTEM (PMIS)

15. *Snezana Pavićević, Božo Vukašinović*

MODIFIED KINNEY METHOD FOR RISK MANAGEMENT OF IMPARTIALITY AND INDEPENDENCE IN INSPECTION AND CERTIFICATION BODY FOR PRODUCTS, PROCESSES AND SERVICES

16. *Jelena Rusov, Mirjana Misita*

THE USE OF FUZZY LOGIC IN RISK MODELING OF INSURANCE COMPANIES OPERATIONS

17. *Dragan Lj. Milanovic, Dragan D. Milanovic, Mirjana Misita*

THE PROBLEM OF CHOOSING BEST ALTERNATIVE PROJECT IN TERMS OF RISK

SESSION B - CHAIRPERSONS: Aleksandar Žunjić, Milica Gerasimović, Zvonko Sajfert

18. *Aleksandar Zunjic, Lidija Matija, Jelena Muncan, Ivana Mileusnic, Ljubisa Petrov*

OCCUPATIONAL HAZARDS IN DENTISTRY - APPLICATION OF THE NEAR INFRARED SPECTROSCOPY IN DIAGNOSTICS OF FATIGUE AND MUSCULOSKELETAL DISORDERS

19. *Ahmed Ali Essdai, Nuri Mohamed Saad*

DENTISTS' WORKSPACE AND MUSCULOSKELETAL DISORDERS PREVENTION: PRELIMINARY STUDY

20. *Ljubiša Petrov, Jelena Muncan, Ivana Mileusnić, Lidija Matija*

ERGONOMIC DESIGN PROPERTIES OF DENTISTRY EQUIPMENT

21. *Nuri Mohamed Saad Algheriani, Ahmed Ali Essdai*

IDENTIFICATION OF ANTHROPOMETRIC MEASUREMENTS' FACTORS OF SERBIAN ADMINISTRATIVE WORKERS: PRELIMINARY STUDY

22. *Aleksandar Zunjic, Jelena Muncan, Lidija Matija, Ljubisa Petrov, Ivana Mileusnic*

GENERAL ERGONOMIC CONSIDERATIONS OF DESIGN OF A TELEROBOTIC SYSTEM

23. *Aleksandar Žunjić, Dragana Žakić Nedeljković*

ERGONOMIC ANALYSIS OF THE EFFECTS OF THE INTRODUCTION OF ELECTRONIC DISPLAYS IN THE COCKPITS OF LIGHT SINGLE-ENGINE PISTON AIRCRAFTS

24. *Ljiljana D. Ristić*

REVIEW OF THE ON-SCREEN READABILITY RESEARCHES

25. *Milica Gerasimovic, Tanja Sijakovic, Ugljesa Bugaric*

CONTINUING PROFESSIONAL DEVELOPMENT FOR ENGINEERS - VOCATIONAL TEACHERS IN MECHATRONICS

26. *M. Jocanovic, V. Karanovic, M. Velickovic*

DIDACTIC EQUIPMENT FOR EDUCATION OF STUDENTS IN AUTOMATED HYDRAULIC SYSTEMS

27. *Marko Arsenovic, Srdjan Sladojevic, Darko Stefanovic*

ONE SOLUTION OF TRAINING COURSE FOR IMPROVING EMPLOYEES SKILLS IN IT DEVELOPMENT COMPANY

28. *Sanja Stanisavljev, Milivoj Klarin, Dragan Čočkalović, Dejan Đorđević, Zvonko Sajfert*

SUCCESSFUL CHANGE MANAGEMENT

29. *Reza Shafieezadehgarousi, Mohammad Omid, Mohammad Shahverdy*

EMPOWERMENT AND ENTREPRENEURSHIP IN JOB ENVIRONMENT

30. *Hrvoje Puskaric, Marija Zahar Djordjevic, Aleksandar Aleksic*

THE CONCEPTUAL MODEL FOR SMALL AND MEDIUM SIZED ENTERPRISES FOR THE PURPOSE OF PROJECT MANAGEMENT

SESSION C - CHAIRPERSONS: Vidosav Majstorović, Robert Minovski, Zorica Veljković

31. *Vidosav Majstorovic, Jelena Macuzic, Slavenko Stojadinovic, Srdjan Zivkovic, Tatjana Sibalija, Valentina Marinkovic*

CYBER PHYSICAL MANUFACTURING – INTEGRATED QUALITY APPROACH

32. *Milovan Medojevic, Jovan Petrovic, Nenad Medic, Milana Medojevic*

ISO 50001 AS A TOOL TO ESTABLISH AN ADEQUATE ENERGY MANAGEMENT SYSTEM

33. *Marija Stanojeska, Robert Minovski, Zvonko Sajfert, Dragan Čočkalo, Sanja Stanisavljev, Bojan Jovanoski*

EMPLOYEES MOTIVATION AND TRANSITION OF ISO 9001 QMS TOWARDS TQM

34. *Branislav Tomic*

OVERVIEW OF ISO/DIS 9001:2015 CHANGES

35. *S. Risteska, M. Stefanovska, B. Samakoski*

FACTORIAL DESIGN OF EXPERIMENT VS. TAGUCHI APPROACH IN FILAMENT WOUND COMPOSITES

36. *Zorica A. Veljković, Slobodan Lj. Radojević*

METHOD FOR COLUMN CONSTRUCTION OF FULL FACTORIAL DESIGNS FOR FACTORS ON TREE LEVELS USING TAGUCHI'S ORTHOGONAL ARRAYS

37. *Slobodan Morača, Jelena Grujić, Angela Fajsi*

CREATING THE AGILE PROJECT ENVIRONMENT: DEVELOPMENT OF EFFECTIVE AGILE TEAMS

38. *Milovan Lazarević, Nemanja Sremčev, Gordana Ostojić, Đorđe Lazarević*

LEAN PRINCIPALS AND RFID USAGE FOR IMPROVEMENT OF DISASSEMBLY EFFICIENCY

39. *Moshe Eben-Chaime*

DEFECTIVE ITEMS, INSPECTION ERRORS AND YIELD

40. *Ljiljana Pecić*

MARKET ORIENTATION AS A PREDICTOR FOR ENGINEERING AND REENGINEERING COMPANY

SESSION D - CHAIRPERSONS: Danijela Tadić, Nikola Dondur, Vlatko Cingoski

41. *Danijela Tadić, Slavko Arsovski, Aleksandar Tomović, Milan Pavlović*

THE FUZZY MODEL FOR EVALUATION WASTE IN PRODUCTION PROCESS OF RECYCLING DEVICE

42. *Danijela Tadić, Snežana Nestić, Miladin Stefanović*

THE EVALUATION AND IMPROVEMENT PERFORMANCES OF MARKETING PROCESS

43. *Marko S. Jarić, Mirko M. Dobrnjac, Nikola J. Budimir, Tamara S. Bajc*

COST ANALYSIS OF SHELL AND TUBE HEAT EXCHANGERS WITH CONCENTRIC HELICAL TUBE COILS

44. *Andrea Ivanišević, Branislav Marić, Alpar Lošonc*

CONCEPTUALIZATION OF COMMON PARAMETERS WHICH ARE REQUIRED FOR TECHNICAL-TECHNOLOGICAL ANALYSIS OF INVESTMENTS

45. *N. Dondur, A. Jovovic, V. Spasojević-Brkić, D. Radić, M. Obradović, D. Todorovic, S. Josipović, M. Stanojevic*

USE OF SOLID RECOVERED FUEL (SRF) IN CEMENT INDUSTRY – ECONOMIC AND ENVIRONMENTAL IMPLICATIONS

46. *Biljana Petrevska, Vlatko Cingoski*

ENVIRONMENTAL PROTECTION AND ENERGY EFFICIENCY CONCEPT IN FIVE STAR HOTELS IN MACEDONIA

47. *Jamal Mohamed Ben Sasi, Ramadan Ahmed Abugeddida*
THE ROLE OF PRIVATE SECTOR IN INDUSTRIES BASED ON IRON AND STEEL PRODUCTS A CASE STUDY: STEEL ANGLES & FLATS FACTORY
48. *Frosina Geceva Kocova, Ljubomir Drakulevski*
BUSINESS PROCESS REENGINEERING IN MERGED COMPANY
49. *Branislav Stevanov, Nemanja Sremčev, Đorđe Lazarević, Danijela Gračanin*
PRODUCT LIFE-CYCLE MANAGEMENT DATA INTEGRATION FOR THE OVERHAUL OF RAILWAY BRAKING DEVICES
50. *Leposava Grubić-Nešić, Slavica Mitrović, Vladimir Ivanković*
ROLE OF HUMAN CAPITAL IN ENGINEERING
51. *Tamara Golubović, Nebojša Manić, Nikola Dondur*
ENERGY AND ECONOMIC ANALYSIS OF USING DIFFERENT FUELS FOR HOUSEHOLD HEATING IN SERBIA
52. *Petar Kefer, Dragan D. Milanovic, Mirjana Misita, Dragan Lj. Milanovic*
MANAGEMENT FOR COMPANIES WITH MULTIPLE LOCATIONS ACCORDING TO EXCEPTIONS
53. *Janko M. Cvijanović, Jelena Lazić*
ORGANIZATIONAL PATHOLOGY
54. *Gordana Čolović, Danijela Paunović, Goran Savanović, Slobodan Pokrajac*
IMPORTANCE KNOWLEDGE MANAGEMENT AND INNOVATIONS FOR THE FASHION INDUSTRY
55. *Slobodan Pokrajac, Nikola Dondur, Sonja Josipović*
RE-INDUSTRIALIZATION OR THE ROAD THAT MUST BE TRAVELLED

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56. *Ping-Hui Hsu, Hui-Ming Teng*
OPTIMAL PRICING STRATEGIES FOR INTERNET MARKETING ON TIME-SENSITIVE PRODUCTS
57. *Dejana Popović, Predrag Popović*
SMART METER - READY TO MARKET SOLUTION ANALYSIS
58. *Maja Novak, Sanja Stanisavljev*
INFLUENCE OF ELECTRONIC BUSINESS FOR ACHIEVING COMPETITIVE ADVANTAGES
59. *Svetlana Dabić Ostojić, Momčilo Miljuš, Dragan D. Milanović*
THE IMPACT OF NEW IT ON FORKLIFTS ON SCM
60. *Marija Rakic-Skokovic, Darko Stefanovic, Bojan Lalic*
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61. *Nebojša Lapčević, Dragan Lj. Milanovic, Marija Milanovic*
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62. *Svetomir Simonović*
SOFTWARE INFRASTRUCTURE FOR GLOBAL PRODUCT ENGINEERING
63. *Zlatko Langović, Brankica Pažun, Duško Tomić*
PROCESSOR SYSTEM ARCHITECTURES AND SECURITY
64. *Miloš Jovanović, Bojan Lalić, Antonia Mas, Antoni-Lluís Mesquida*
THE AGILE APPROACH IN INDUSTRIAL AND SOFTWARE ENGINEERING PROJECT MANAGEMENT
65. *Marko S. Jarić, Nikola J. Budimir, Igor Svetel*
PREDICTING ENERGY CONSUMPTION USING CURRENT BIM SOFTWARE
66. *Marko S. Jarić, Nikola J. Budimir, Igor Svetel*
PREPARING BIM MODEL FOR ENERGY CONSUMPTION SIMULATION

SESSION F - CHAIRPERSONS: Katarina Dimić Misić, Ilija Čosić, Andrey A. Pazyak

67. *Hui-Ming Teng, Ping-Hui Hsu*

OPTIMAL SALE NUMBER OF KIND FOR SPECIALIZED SHOP WITH INCREASING DEMAND

68. *Radoslav Rajkovic, Nenad Zrnic, Đorđe Stakic, Aleksandar Sedmak, Snežana Kirin*
AN APPROACH TO DETERMINE OPTIMAL NUMBER OF CONTAINERS FOR CARGO STACKING IN FUNCTION OF TRANSPORTATION COST
69. *Nemanja Sremčev, Đorđe Lazarević, Ilija Čosić, Milovan Lazarević, Aleksandar Rikalović*
IMPROVEMENT OF MATERIAL FLOW IN SYSTEM FOR MANUFACTURING OF COOLING AND COOKING DEVICES
70. *Katarina Dimic-Misic, Patrick Gane, Tatiana Budtova, Christophe Pradille, Herbert Sixta, Lovikka Ville, Thad Maloney*
INFLUENCE OF XYLAN ON NANOCELLULOSE (NFC) SUSPENSION RHEOLOGY AND AEROGEL MORPHOLOGY
71. *Dimitrios Tsalagkas, Katarina Dimic-Misic, Patrick Gane, Orlando J Rojas, Thaddeus Maloney, Levente Csoka*
RHEOLOGICAL BEHAVIOUR OF SONOCHEMICALLY PREPARED BACTERIAL CELLULOSE AQUEOUS DISPERSIONS
72. *Dimic-Misic Katarina, Alp Karakoc, Merve Ozkan, Syed Ghufuran Hashmi, Tuomo Salo, Patrick Gane, Thad Maloney, Jouni Paltakari*
FLOW CHARACTERISTICS OF INK-JET INKS USED FOR FUNCTIONAL PRINTING
73. *Vule Reljić, Laslo Tarjan, Stevan Stankovski, Milovan Lazarević, Gordana Ostojić*
FOOD PRODUCT SHELF-LIFE PREDICTION
74. *Arsić Miodrag, Srđan Bošnjak, Mladen Mladenović, Nebojša Milovanović, Zoran Savić*
RECOMMENDATION FOR A NEW MODEL OF THE MAINTENANCE SYSTEM OF TURBINE AND HYDROMECHANICAL EQUIPMENT AT THE HYDRO POWER PLANT DJERDAP 1
75. *Vladimir N. Syzrantsev, Kseniya. V. Syzrantseva, Andrey A. Pazyak*
CALCULATING GEOMETRIC PARAMETERS OF THE SEMI-ROLLED STRAIGHT PAN GEAR
76. *Predrag Živković*
HEAT BALANCE OF LOSSES IN PLANETARY GEAR DRIVES
77. *Nermina Zaimović-Uzunović, Narcisa Jarović-Bajramović, Edin Terzić*
INFLUENCES TAKEN INTO CONSIDERATION DURING CALIBRATION OF CONTACT THERMOMETERS AIMED FOR MEASURING TEMPERATURE OF A SOLID SURFACE
78. *Nina Anđelić, Vesna Milošević-Mitić, Taško Maneski, Milorad Milovančević, Đorđe Đurđević*
OPTIMUM DESIGN OF OPEN SECTION THIN-WALLED STRUCTURAL ELEMENTS ACCORDING TO STRESS CONSTRAINT
79. *Nataša Trišović, Wei Li, Ljubica Milovic*
SIMULATIONS IN REANALYSIS PROCEDURES
80. *Jelena R. Jovanovic, Radisav D. Djukic*
ESTABLISHING TECHNOLOGICAL CYCLE TIME LENGTH OF THE PRODUCTION PHASE IN THE COMBINED MODE OF WORKPIECE MOVE

ROUND TABLE DISCUSSION

Topic: *Scalability in manufacturing systems design and operation and a roadmap to create impact on economic and social sustainability*

Facilitator: **Goran D. Putnik**, *DrSc, Dr. Habil, Professor, Department of Production and Systems Engineering & Research Centre ALGORITMI, University of Minho, Portugal*

Abstract: The lecture presents an introduction to scalability, state-of-the art in manufacturing and computer science, and related applications including manufacturing and education and a roadmap for future research and developments towards a '+10' time framework and beyond. Scalability of systems, and in our particular case of manufacturing systems, could be seen as a system's feature that might provide a significant increase of potentials for resolving a number of problems in manufacturing systems design and operation and for enabling new visions, whether quantitatively or qualitatively. In other words, manufacturing systems scalability might provide further optimization of the manufacturing systems design and operation or enable the development of paradigmatically new manufacturing systems for the sustainability and wellbeing society. Besides the functional aspects of scalability, which could be seen as primarily technical issues, by considering the wider social concerns the scalability feature might also be seen as an instrument for value increase, following communities' requests for value creation and sustainable society. Scalability modeling and applications are widely considered in an ample range of application areas, with special success in CompSci and, conditionally speaking, virtually initial success in MS. The question is whether scalability deserves, and whether it would be useful, to be considered as an emerging discipline. Another scalability issue that could be emphasized is the social dimension of scalability, i.e. its possible impact on social issues such as innovation, employment and economic development. The lecture covers the main design, management and operational aspects of scalability in Manufacturing Systems (MS). It promotes scalability as an area of research of MS theory and practice in order to enhance techniques and methodologies in existing MS paradigms using advanced and emerging design and management approaches and ICT, and meet challenges of emerging MS paradigms and support their promotion and effective and efficient deployment in practice.

Keywords: Manufacturing system, Flexibility, Scalability