The Bangladesh Institute of Management (BIM), established in 1961, has been entrusted with the responsibility of developing human resource and improving managerial skills and techniques at various levels of management. BIM imparts management training, provides consultancy services and undertakes research and publication in the related fields of socio-economic and industrial management development.

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# IMEOM 2019Dhaka

2nd International Conference on Industrial and Mechanical Engineering and Operations Management (IMEOM)

12-13 December, 2019 , Bangladesh Institute Of Management (BIM),
4,Sobhanbag, Mirpur Road, Dhaka 1207, Bangladesh
www.ieombd.org/imeom2019

Organised by:
Production Management Division, BIM and
IEOM Society of Bangladesh
Supported by: IEOM Society International

## Program Schedule

| Day One: 12 December, 2019 (Thursday) | | |
|---|---|---|
| 915 1700 | **Registration** | Venue: Room No 312 |
| 830-900 | **Morning Keynote** | Venue: Room No 314-A |
| Keynote Speaker | Prof Dr. M Iqbal (SUST) | |
| Title: | Industry 4.0 and Bangladesh | |
| Session Chair: | Prof Dr. Md. Mamunur Rashid (BIM) and Dr. A.R.M. Harunur Rashid (IUT) | |
| 900 1000 | **Long Keynote** | Venue: Room No 314-A |
| Keynote Speaker | Prof Dr. Abdur Rahim, UNB, Canada | |
| Title: | An Integrated Approach on Operations Management, Quality Management, Maintenance and Supply Chain Management | |
| Session Chair: | Prof Dr Nurul AbsarChowdhury, IUT and Prof Dr. Md. Mamunur Rashid (BIM) | |
| 1000 1015 | **Tea Break [working]** | |
| 1000-1100 | **Technical Session 5** | Venue: Room A |
| Session Chair | Prof Dr. Md. Zahid Hossain, IUT and Prof Dr. M Sarwar Morshed (AUST) | |
| ID | Title | Affiliation |
| 22 | Reduction of Power Consumption in Gas Booster Compressor | Ashuganj Power Station Company Ltd. |
| 24 | Experimental Analysis of CFRP Drill Hole Quality Based on Pre-Hole & Force | Shenyang Aerospace University |
| 89 | Analysis and Optimization of Traffic Congestion at Single Intersection Using MATLAB and Arena | Bangladesh University of Textiles |
| 49 | Implementation Of TQM In a RMG Factory- An Empirical Case Study. | SUST |
| 63 | Effects of NACA 0012 and NACA 2412 Airfoils as Rear Spoilers | BUET |

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| | on Sports Car Aerodynamic Drag & Lift: a CFD Study | |
| 1000-1100 | **Technical Session 6** | Venue: Room B |
| Session Chair | Prof. Dr. A.K.M Masud, BUET and Prof Dr. M Iqbal (SUST) | |
| ID | Title | Affiliation |
| 23 | Sustainable conventional electricity generation | Ashuganj Power Station Company Ltd. |
| 64 | Scrutinizing the Effect of Three Process Parameters on the Two Mechanical Characteristics of Lead-Tin Alloy Casting by Using Taguchi Orthogonal Array | Rajshahi University of Engineering & Technology |
| 65 | Acceleration Analysis Of Transversely Vibrated Cracked Shaft | Bangabandhu Sheikh MujiburRahman Maritime University |
| 85 | Development of PLC and SCADA based Central Alarm System for Glass Bottle Manufacturing Industry | World University of Bangladesh |
| 86 | Application of PLC and SCADA Based Real-Time Online Counter for Glass Bottle Manufacturing Industry in Bangladesh | World University of Bangladesh |
| 1115-1615 | **Student Talk for IMEOM** | Venue: Room-C |
| | Selection Round | |
| 1100 1200 | **Technical Session 1** | Venue: Room A |
| Session Chair: | Prof Dr. Md. Haider Ali Biswas, Khulna University and Dr. A.R.M. Harunur Rashid (IUT) | |
| ID | Title | Affiliation |
| 59 | Optimal Planning and Management of Groundwater Level Declination: A Mathematical Model | Khulna University |
| 60 | Modeling The Dynamics of Spreading Rumors and Fake News Through Online and Social Media | Khulna University |
| 52 | Optimal Control Applied to the Treatment Strategy for Chronic Liver Disease | Khulna University |
| 11 | Designing and Organizing a Training Course in an Organizations | Bangladesh Institute of Management |
| 56 | Dissatisfaction in the workplace and its correlation to high staff turnover | University of Johannesburg, South Africa |
| 1100 1200 | **Technical Session 2** | Venue: Room B |
| Session Chair: | Prof Dr. Shamsuddin Ahmed, IUT and Prof Dr. M Iqbal (SUST) | |
| ID | Title | Affiliation |
| 10 | Organizational Readiness for introducing a performance Management System. | Titas Gas Transmission & Distribution Co. Ltd |
| 9 | Major Barrier to Industrialization in Bangladesh | Babylon group, BIM |
| 40 | Energy Recovery from Gas Distribution by incorporating Turbo Expander | Ashuganj Power Station Company Ltd. |

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| 45 | A Design Approach to Improve Existing CNG Filling Station by Improving the Layout | Shahjalal University of Science & Technology, Sylhet |
| 67 | Using Total Productive Maintenance as an Assessment in Improving System Performance | University of Johannesburg, SA |
| 1200 - 1300 | **Technical Session 3** | Venue: Room A |
| Session Chair: | Dr. Parveen Ahmed, Director,BIM<br>and Prof Dr. M SarwarMorshed (AUST) | |
| ID | Title | Affiliation |
| 15 | Characteristics Analysis of Laser Beam Machining Process | IUT |
| 2 | Mathematical Modeling Of Friction On The Cutting Zone During Orthogonal Cutting | University of Lagos, Nigeria |
| 75 | Optimizing the Hotel Management System with Marketing Segments | Khulna University |
| 74 | Particle transport through periodic tube with hexagonal cross-section | Khulna University |
| 68 | A Comparative Analysis of Natural and Artificial Flavorings through Analytical Methods and Flavor Additive Regulations | University of Johannesburg, SA |
| 1200 - 1300 | **Technical Session 4** | Venue: Room B |
| Session Chair | Prof Dr Ali, BUTEX and Dr. A.R.M. Harunur Rashid (IUT) | |
| ID | Title | Affiliation |
| 12 | Numerical Analysis of Natural Convection Heat Transfer from Slender Body in a Channel | IUT |
| 5 | Common Mistakes in Boiler Operation & Maintenance(Perspective Bangladesh) | Office of the Chief Inspector of Boilers, Dhaka |
| 79 | Study On The Use Of Agent Based Modeling To Simulate Consumer Behavior | Ahsanullah University of Science and Technology |
| 6 | Problems and Prospect of Textile Industry in Bangladesh | Deeplaid Laboratories Limited |
| 55 | Productivity Improvement at Coca-Cola | University of Johannesburg , SA |
| 1300 1335 | **Lunch and Prayer Break** | Venue: Cafeteria |
| | | |
| 1335 1400 | **Afternoon Keynote** | Venue: Room A |
| Keynote Speaker | Prof Dr. Shamsuddin Ahmed, IUT | |
| Title: | Industry –Academia Partnership in Engineering Education | |
| Session Chair: | Prof Dr. M Iqbal (SUST) and andDr. A.R.M. Harunur Rashid (IUT) | |
| 1400 -1500 | **Technical Session 9** | Venue: Room A |
| Session Chair | Prof Dr. M SarwarMorshed (AUST)and Prof Dr. Md. Mamunur Rashid (BIM) | |
| ID | Title | Affiliation |
| 90 | Improvement of Transportation Efficiency Using Simulation-Based Decision Support System | |

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| 91 | Risk Minimization of Warehousing System by showing Probable Total Costs towards any Certain Company with the help of Monte Carlo Simulation | |
| 84 | Endogeneous Uncertainties Of Agricultural Production Yield \| Case Study | RUET |
| 81 | Fuzzy Logic Application for Aircraft Landing Performance Analysis | Shenyang Aerospace University, CHINA |
| 69 | Productivity Improvement at a Soft Drink Manufacturing Company: A Case Study | University of Johannesburg, SA |
| 1400 -1500 | **Technical Session 10** | Venue: Room B |
| Session Chair | Prof. Dr. Munnujahan Ara, Khulna University and Dr. A.R.M. Harunur Rashid (IUT) | |
| ID | Title | Affiliation |
| 77 | Mathematical Modeling Applied to Study the Effects of Wastage Produced from the Coal-Based Power Plant on Marine Ecosystem | Khulna University |
| 78 | Mathematical Modeling Applied To Assess The Environmental Effect Of Smog Concentration In Dhaka City | Khulna University |
| 7 | Analysis of National Skill Development Policy of Bangladesh-2011 : Problem & Prospect. | Youth Spinning Mills Ltd. , BIM |
| 8 | Security Compliance Study | Padma Group of Converters, BIM |
| 70 | Impact of Workplace Conditions on Level of Employee Satisfaction | University of Johannesburg, SA |
| 1500-1600 | **Technical Session 7** | Venue: Room A |
| Session Chair | Dr. Mamun Habib, BracU and Dr. A.R.M. Harunur Rashid (IUT) | |
| ID | Title | Affiliation |
| 39 | Clean Power Generation in Bangladesh | Ashuganj Power Station Company Ltd. |
| 66 | Static and Fatigue Behavior Analysis of New Design Leaf Spring of Different Material Combination | Shahjalal University of Science and Technology, Sylhet |
| 14 | The hidden costs of servitized business models | Indian Institute of Management Calcutta |
| 16 | Employee Health, Safety & Accident In Pharmaceuticals Industry In Bangladesh | BIM |
| 17 | Legal framework for the industrial relation system in Bangladesh | Babylon Casualwear Ltd , BIM |
| 1500-1600 | **Technical Session 8** | Venue: Room B |
| Session Chair | Dr. A.S.M. MojahidulHoque, JUST and Dr. M. Hasanuzzaman, BUET/ Prof Dr. Md. Haider Ali Biswas, Khulna University | |
| ID | Title | Affiliation |
| 20 | Technological Change and Automation in Bangladesh | CEMS Global |
| 27 | World Trade Organization Rules on Sanitary and Phytosanitary Measures: Bangladesh Perspective | Bangladesh Institute of Management |

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| 29 | Occupational Safety & Health for Hospital Workers in Dhaka | Pro Active Medical College & Hospital Ltd. |
| 87 | Development of VFD, PLC and SCADA Based Fluid Temperature, Pressure and Level Control for Food Manufacturing Industry | World University of Bangladesh |
| 88 | An Image Processing Based Glass bottle Defect Detection System | World University of Bangladesh |
| 1400-1500 | **Tea and Prayer Break** | |
| 1400 1500 | **Inaugural Ceremony** | Venue: Room 314 |
| Chief Guest: | Md. Abdul Halim, Secretary, Ministry of Industries | |
| Session Chair: | Tahmina Akhter, Director General, BIM and Prof Dr. M Iqbal (SUST) | |
| 1645-1710 | **Highlighted Paper Session** | Venue: Room 314 |
| ID | **Title** | Affiliation |
| 3 | An Exploration of Differences between Professional Advancement of Project Managers based on their Gender in Operations-Driven and Project-Driven Organizations | Dr. Guru Prabhakar, UWE, Bristol, UK |
| 4 | Boiler Manufacturing Scenario in Bangladesh | Md. HanifHossan, Office of the Chief Inspector of Boilers, Bangladesh Govt |
| Session Chair | Prof Dr. M Sarwar Morshed (AUST) and Dr. A.R.M. Harunur Rashid (IUT) | |
| 1710-1720 | **Tea and Prayer Break** | |
| 1720-1740 | **Evening Keynote** | Venue: Room No 314-A |
| Keynote Speaker | Prof Dr. Md. Haider Ali Biswas, Khulna University | |
| Title: | Optimization and Optimal Control Technique: Applications to Modeling Healthcare Systems | |
| Session Chair: | Prof Dr. M Iqbal (SUST) and Dr. A.R.M. Harunur Rashid (IUT) | |
| 1745-1945 | **Cultural Program** | Venue: Ground Floor |
| 1945 - 2045 | **Gala Dinner(Banquet)** | Venue: Cafeteria of BIM |
| Chief Guest: | BIM | |
| Dinner Speaker/Special Guest | Prof Dr. M Iqbal (SUST) and Prof Dr. Md. Mamunur Rashid (BIM) | |
| Chair: | Tahmina Akhter, Director General, BIM | |

| **Day Two: 13 December, 2019 (Friday)** | | |
|---|---|---|
| 915=1700 | **Registration** | Venue: Room No-312 |
| 800-830 | **Keynote** | Venue: Room 314-A |
| Keynote Speaker | Dr. A.R.M. Harunur Rashid (IUT) | |

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|---|---|---|
| Title: | Disruptive Innovation and Industry 4.0 | |
| Session Chair: | Dr Azizur Rahman, AUST and Prof Dr. M Iqbal (SUST) | |
| 830 900 | **Keynote** | Venue: Room 314-A |
| Keynote Speaker | Prof Dr. M SarwarMorshed (AUST) | |
| Title: | Occupational Health &Safety (OHS) and Productivity Improvement in RMG Industries – A Lesson Learned for Sustainable Development | |
| Session Chair: | Dr. Khandakar Akhter Hossain, Ctg Port Authority | |
| 900 930 | **Keynote** | Venue: Room 314-A |
| Keynote Speaker | Prof Dr. Md. Mamunur Rashid (BIM) | |
| Title: | Technological Innovation and Management for Industry 4.0 for Sustainable Development | |
| Session Chair: | Dr. Engr. Md. Lutfor Rahman, River Research Institute | |
| 930 1000 | **Keynote** | Venue: Room 314-A |
| Keynote Speaker | Prof Dr.Lal Mohan Baral, AUST | |
| Title: | Textile Engineering in Bangladesh | |
| Session Chair: | Taufail Ahmed, Visionites Bangladesh Ltd | |
| 1000 1015 | **Tea Break [working]** | |
| 1015-1215 | **Student Talk for IMEOM** | Venue: Room C |
| | Final Round | |
| 1000 1100 | **Technical Session 11** | Venue: Room A |
| Session Chair: | Dr. Md. Altab Hossain, MIST and Dr. A.R.M. Harunur Rashid (IUT) | |
| ID | Title | Affiliation |
| 30 | Occupational Stress and work-life imbalance of Working Women-Bangladesh Perspective | ISB, BIM |
| 31 | Quality and Safety Assurance in Ready Made Garments Industry | Asrostex Group |
| 32 | Safety, Health and Welfare procedure of Garments sector in Bangladesh | Walton Group , BIM |

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| 33 | Health safety and hygiene in RMG in Bangladesh | BIM |
| 34 | Maternity Benefits and Welfare. | Padma group of converters, BIM |
| 1000 1100 | **Technical Session 12** | Venue: Room B |
| Session Chair: | Prof Dr Iqbal Mahmud ,MBSTU Textile and Prof Dr. Md. Mamunur Rashid (BIM) | |
| ID | Title | Affiliation |
| 35 | National child labour law 2006 in Bangladesh Perspective | Manabik Shahajya Sangstha (MSS), BIM |
| 36 | Effectiveness of laborlaw in MeghnaGroupofindustries: Forces on section 78 to 99 | Meghna group of industries , BIM |
| 37 | Implementation of labor law in terms of health & safety issues in RMG sector of Dhaka division | GenvioPharma Limited , BIM |
| 38 | Emerging Challenge and problems work place in Bangladesh | Asrostex Group, BIM |
| 42 | Role and development procedure of executive personnel in Nestle Bangladesh Ltd | First AiD Hospital , BIM |
| 1100 - 1200 | **Technical Session 13** | Venue: Room A |
| Session Chair: | Prof Dr. M Iqbal (SUST) and Prof Dr. M Sarwar Morshed (AUST) | |
| ID | Title | Affiliation |
| 18 | Determination Of Demand Forecasting Techniques Applicable For Electronics Product (Cell Phone) And Comparative Analysis | Shahjalal University of Science and Technology, Sylhet |
| 19 | Study And Evaluation Of Inventory Management System Of Pharmaceutical Products In A Healthcare Service Facility | Shahjalal University of Science and Technology, Sylhet |
| 41 | Study of Existing Safety Signs in Three Selected Thermal Power Plants Situated in Sylhet Division, Bangladesh | |
| 47 | Motivating and reenforcement safety and Healthy | Perfect Printing, BIM |
| 26 | Effects of Environmental and Safety Factors on Productivity of RMG Industry in Bangladesh: A Survey-Based Approach. | Shahjalal University of Science & Technology, Sylhet |
| 1100 - 1200 | **Technical Session 14** | Venue: Room B |
| Session Chair | Dr. Shafiqul Islam, Head, Nuclear Dept and and Dr. A.R.M. Harunur Rashid (IUT) | |

| ID | Title | Affiliation |
|---|---|---|
| 43 | Proposed Assessment Model for Ship Recycling Industry in Bangladesh | CPA |
| 44 | Global warming and Impact to Third World Countries | CPA |
| 46 | Globalization and its impact on workers and industrial social work practices: Bangladesh Perspective | Bangladesh Institute of Management |
| 50 | Health Related Quality of Work Life in RMG sector in Bangladesh | Bangladesh Institute of Management |
| 51 | Compliance with the WHO Surgical Safety Checklist | Bangladesh Institute of Management |
| 103 | Effects of Climate Change on Occupational Health, Safety and Productivity | |
| 1215-1345 | **Lunch and Prayer Break** | Venue: Cafeteria |
| 1345-1600 | **Industry-Academia and Global Engineering Education Panel Discussion** | Venue: Room C |
| Session Chair: | Prof Syed Fakhrul Hassan, SEU and Prof Dr. Md. Mamunur Rashid (BIM) | |
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| 1400-1500 | **Technical Session 1 5** | Venue: Room A |
| Session Chair | Prof. Dr. Faruque A. Haolader, IUT and Prof Dr. M Sarwar Morshed (AUST) | |
| ID | Title | Affiliation |
| 95 | A Crowdsourced Approach for Supply Chain Network Optimization Using Hub and Spoke Model | Military Institute of Science and Technology |
| 28 | Curriculum and competence based education and training in Bangladesh | BIM |
| 53 | Emerging Challenge and problems work place in Bangladesh | PRAN RFL , BIM |
| 54 | 5S in Total Productive Maintenance (TPM) : A case study | BIM |
| 61 | A Study on Diesel Engine Combustion | Bangabandhu Sheikh MujiburRahman Maritime University (BSMRMU) |
| 102 | Preparing and Using the Case Method of Teaching | Visionites Bangaldesh Ltd |
| 1400-1500 | **Technical Session 16** | Venue: Room B |
| Session Chair | Dr. A.R.M. Harunur Rashid (IUT) | |
| ID | Title | Affiliation |
| 1 | A Case Study on Optimization of Production | Islamic University of Technology |

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| | Process in a Textile Industry | (IUT) |
| 25 | Development of an Innovative Fireball Fire Extinguishing System | Islamic University Of Technology |
| 92 | Study of automotive battery recycling and development of a sustainable method | Islamic University of Technology (IUT) |
| 96 | Design and Fabrication of Foldable Bicycle | Military Institute of Science and Technology (MIST) |
| 97 | Effect of Fiber Loading on Thermo-Mechanical Properties of Onion Roots and Broom Grass Fiber Reinforced Hybrid Polypropylene Composites | Bangladesh University of Engineering and Technology (BUET) |
| 99 | Causes of Low Back Pain among Workers of a Garment Industry in Bangladesh | Shahjalal University of Science and Technology, Sylhet (SUST) & IUT |
| 106 | Labour Unrest in Garment Sector; Policy Options for Bangladesh | BIM |
| 1500-1600 | **Technical Session 17** | Venue: Room A |
| Session Chair | Prof Dr. Lal Mohan Baral, AUST and Dr. A.R.M. Harunur Rashid (IUT) | |
| ID | Title | Affiliation |
| 21 | Eliminating Bad Work Posture by Proposing an Alternative Ergonomic Workstation Design in the RMG Industry. | Shahjalal University of Science and Technology, Sylhet |
| 62 | Pollutants From Inland Vessels Of Bangladesh - A Threat To The Environment | Bangabandhu Sheikh MujiburRahman Maritime University (BSMRMU) |
| 71 | Implementation of labor law in terms of health & safety issues in RMG sector of Dhaka division | Genvio Pharma Limited , BIM |
| 76 | Problems and Prospect of Textile Industry in Bangladesh | Deeplaid Laboratories Limited |
| 80 | Role and development procedure of executive personnel in Nestle Bangladesh Ltd | First AiD Hospital , BIM |
| 104 | Organizational Conflict – an HR Challenge in the 21st Century: Bangladesh Perspective | BIM |
| 1500-1600 | **Technical Session18** | Venue: Room B |
| Session Chair | Prof Dr.Mahbubul Alam, CUET and Prof. Dr. M Sarwar Morshed (AUST) | |
| ID | Title | Affiliation |
| 93 | Using Discrete event simulation to improve the patient flow of a healthcare system. | Shahjalal University of Science and Technology, Sylhet |
| 82 | Legal framework for the industrial relation system in Bangladesh | Babylon Casualwear Ltd, BIM |
| 83 | Major barrier of industrialization in Bangladesh | Babylon group , BIM |

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| 98 | Characterization of Glazing Defects and Study for Prevention Measures Focusing Traditional Tableware Ceramic Industry in Bangladesh | Bangladesh University of Engineering and Technology (BUET) |
| 101 | True 'Technology Transfer': Crying need at the moment | DPDT,MOI |
| 100 | Stakeholder Management in Complex Projects- A Comparative Case Study | AUST |
| 105 | Water Acting as a Dredger to Protect River Side Industry due to Construction of Bamboo Bandals | River Research Institute, Faridpur |
| 1600-1615 | **Tea Break** | |
| 1615 1700 | **Closing Ceremony** | Venue: Room 314-A |
| Chief Guest: | Tahmina Akhter, Director General, BIM | |
| Chair: | Prof Dr. M Iqbal (SUST) | |
| Facilitator: | Prof Dr. Md. Mamunur Rashid (BIM) | |
| 1730-1830 | **IEOM Meeting** | Venue: Room 314-A |

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Notes:::

A= Level 3=Room No314=Hall Main
B= Level 3=Room No317
C= Level 3=Room No316
D= Level 3=Room No315
Cafeteria = Ground floor at the right side building
Prayer Room =3rd floor of Library building

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Morning Keynote Day One

# Industry 4.0 and Bangladesh

**Prof Dr. Engr. Mohammad Iqbal**
Department of Industrial and Production Engineering
Shahjalal University of Science and Technology
Sylhet, Bangladesh
iqbalm_ipe@yahoo.com

## Abstract

The fourth industrial revolution encompasses areas which are not normally classified as industry, such as smart cities for instance. Although the terms "industry 4.0" and "fourth industrial revolution" are often used interchangeably, "industry 4.0" refers to the concept of factories in which machines are augmented with wireless connectivity and sensors, connected to a system that can visualize the entireEnvironment.

The term Industry 4.0, shorten to 4.0 or simply 4, originated in 2011 from a project in the high-tech strategy of the German government, which promotes the computerization of manufacturing.The term industry 4.0 was publicly introduced in the same year at the Hannover Fair.Although in its conceptual state, Industry 4.0 promises a revolutionary leap in manufacturing industries for the next 10-20 years.

Industry 4.0 is defined as a computerized manufacturing industry with connected intelligent devices, machines and physical objects; the goal is to construct an intelligent factory which is characterized by adaptability, resource efficiency and ergonomics. It integrates customers and business. Its advantages are: (i) Communicate independently and without wire(ii) Optimized individual customer product manufacturing(iii) Resource efficient production(iv) Create energy saving efficiencies and(v)Lower the amount of carbon emitted.

The keynote paper includes different stages of Industry 4.0, components of Industry 4.0, advantages of Industry 4.0,adaption of the higher education to the requirements of Industry 4.0 vision, in particular the engineering education, Government policy, BCIC (Bangladesh Chemical Industries and Corporation) required steps to face Industry 4.0, Prospects, present scenarios of Industry 4.0 in Bangladesh, future change in Bangladesh

**Keywords**
Industry 4.0, Bangladesh

**Biography**

**Professor Dr. Mohammad Iqbal** is currently serving as a Professor at Shahjalal University of Science and Technology (SUST) under the Department of Industrial and Production. He is the founder lecturer of Department of Industrial and Production, SUST. He served as the Head of the dept. for 13 years. Dr. Iqbal was the Dean of School of Applied Science and Technology for two years. He was the Head of Petroleum and Mineral Engineering Dept. Shahjalal University of Science and Technology (SUST), Sylhet, Bangladesh for one year.He was a member, Peer Review Committee on Engineering & Applied Science, Ministry of Science, Information and Communication, Republic of Bangladesh Government for the selection and peer review of different research projects for the financial yearJune 2006-July 2007. He has more than 80 National and International publications in Conference Proceedings. He is one of the advisors to the Sylhet Chamber of Commerce and Industries, Sylhet, Bangladesh. Presently he is the member of SUST research centre, Shahjalal University of Science and Technology (SUST), Sylhet, Bangladesh. He is a member of Institution of Engineers, Bangladesh. He is the member secretary IEB Sylhet Centre, Sylhet, Bangladesh. At present Dr. Iqbal is the chair of IEOM Society-Bangladesh Chapter.

Long Keynote Day One

# An Integrated Approach on Operations Management, Quality Management, Maintenance and Supply Chain Management

**Dr. Abdur Rahim**
Professor of Quantitative Methods
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## Abstract

The integration in production planning, operations management, scheduling, maintenance and quality has gained much attention from researchers in recent years. These areas are usually treated independently, which yielded independent models for each function. It is widely believed that these separate models will provide suboptimal solutions, due to the fact that they are interrelated. Proper understanding of this dependency will open a new avenue for more integrated models, and result in significant savings in operational cost and improved efficiency for any production system.Operations management focuses on carefully managing the whole process to produce products or services economically. It utilizes the system view that underlies modern quality management thinking. Another important business philosophy is supply chain management involving efficient movement of materials, money and information. Operations management, quality management and supply chain management have been proposed as means of improving quality, while simultaneously reducing cost, eliminating waste and improving efficiency. They can be used as a complementary elements of an integrated strategy aimed at improving competitiveness. This talk will provide an overview of recent work on the integration of these three management systems.

**Keywords**
Production Planning, Quality Control, Operations Management

## Biography

**Dr. Abdur Rahim** is a Professor of Quantitative Methods at the Faculty of Business Administration, University of New Brunswick (UNB) at Fredericton, Canada. He joined the UNB in 1983. He received his B.Sc. (Honors) and M.Sc. in Statistics from the University of Dhaka, D.S. in Operations Research from the University of Rome, M.Sc. in Systems Theory from the University of Ottawa, and Ph.D. in Industrial Engineering from the University of Windsor.Since 1994, Dr. Rahim has been adjunct visiting Professor at King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. He is a member of the Editorial Boards for Economic Quality Control, the Journal of Quality in Maintenance Engineering, the Journal of Quality Engineering and Technology, and the International Journal of Production Research. Dr. Rahim has authored and co-authored more than one hundred research papersin operations research, statistical process control, production planning, inventory control, maintenance and TQM in reputed scholarly journals. He has co-edited books on the emerging field of quality control, were published by Kluwer Academic Publishers. One presents a broad survey of optimization in quality control and focuses on industrial and national competitiveness; while the other focuses on integrated models in production planning, inventory control, and warranty analysis and maintenance policy.

Afternoon Keynote Day One

# Industry –Academia Partnership in Engineering Education

**Prof Dr. Shamsuddin Ahmed**
Professor
Department of Mechanical and Production Engineering (MPE)
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## Abstract

Engineering is a profession in which the knowledge of mathematics and natural sciences gained by study, experience, and practice that is applied with judgment to develop ways to utilize, economically, the material and forces of nature for the benefit of mankind (ABET). And, Industrial Engineering (IE)is an approach applied to all factors - material, machine, method, money and human, involved in manufacturing, assembling and distribution of goods and services.IE is the ultimate of all Engineering disciplines. This is necessary in manufacturing and service industries as well as in government organizations.IE is concerned with the design, improvement, and installation of integrated systems of people, materials, information, equipment, and energy. It needs specialized knowledge and skills in mathematical, physical, and social sciences together with principles and methods of engineering analysis and design to specify, predict, and evaluate the results to be obtained from such systems.IE covers waste elimination, inventory and supply chain management, production scheduling and control, computerized control and communication systems, project management, quality and reliability, and several other functions. An industrial engineer is an 'internal consultant' who is concerned with the entire production and distribution, under the circumstances of new and fascinating changes and challenges.Thus, the role of an engineer has a direct and vital impact on the quality of life for all people. Various challenges and problems associated with human life changes on societal and economic factors. Engineers in the new paradigm of globalization need to be prepared with new sets of skills through integrated education and research approaches. Engineering education has a very important role in a society, in order to bridging the gap between the world of today and education that addressing local, regional and global challenges. The focus of 21st century engineering education is hence vital to prepare engineers who will focus on sustainable development. This talk focuses on the challenges engineers and engineering education faces in the 21st century and describes the role and opportunities engineering educators have to respond to these challenges.

**Keywords**
Engineering, Education, Challenges, Integrated system, Sustainability, Curriculum innovation

**Biography**

**Shamsuddin Ahmed** Muhammad Shahadat Ullah Patwaryhas been serving as an academic in different universities since 1986. Currently he is a Professor in the Department of Mechanical and Chemical Engineering Islamic University of Technology (IUT) Dhaka, an Organ of the Organization of Islamic Cooperation (OIC).He obtained his BScEng(Mech) from the reputed Bangladesh University of Engineering and Technology (BUET) and secured 1st class, and Master of Engineering degree from renowned Asian Institute of Technology (AIT), and PhD from University of Malaya (UM), Kuala Lumpur Malaysia which is ranked in 100 best universities in the world (QS and THE). Besides, he obtained a postgraduate diploma in human resources management. He worked as an executive under the ministry of education Bangladesh between 1985 and 1986 and later joined CUET (BITC).He served UM between 1997 and 2015 and later joined IUT in 2015. In University of Malaya, he designed/introduced anddelivered a good number of subjects for both undergraduate and postgraduate classes and received a number of *Excellent delivery certificates* for consecutive sessions. He supervised 12 PhD candidates at UM, out of them seven (7) were graduated. Also, eighteen (18)MEngSc and MEng candidates graduated under his supervision at UM. One postdoc candidate worked with him at UM. He has been quite involved with OBE and PBL kind of teaching methodologies, and engineering degree accreditation processes. To his credit, his research team published around100 journal papers and110 conference articles. About 50 of them were published in ISI-indexed journals/proceedings. His team received several thousand international citations, and significant number of h andi10indices. His research interests are in areas of manufacturing planning and control, green supply chain management, operations research, quality and reliability engineering, maintenance engineering, engineering/managerial economyindustrial energy savingsand human resources management. He administered several research projects as the project leader (PI) including one High Impact Research (HIR) at UM. He assessed a number of project proposals submitted by different researchers for fundingin University of Malaya and from other universities in Malaysia. He served as a referee for different academic positions in Malaysia and Saudi Arabia.Also, served as an external assessor for a postgraduate programme on sustainable energy for a Saudi Arabian university.He gave several invited lectures including key note lectures. He examined a good number of postgraduate theses from different universitiesand reviewed about 50 papers for reputed Elsevier, Emerald journals (UK), IMechE, Hindawei, Inderscience and some other journals. He was the Director of Institutional Quality Assurance Cell (IQAC) of a university.He holds CEng(UK)certification, IET(UK) Membership, and IEB Life Fellowship (since 2000).He was actively involved with IEB activities and was the founding Hon Secretary of IEB Malaysia and Thailand Chapters. Both chapters received awards as the

best overseas chapters of IEB, awarded by the Honorable Prime Minister of the People Republic of Bangladesh. As a social worker, he was the organizer of a degree-level college established in 1988, President of CUET unit of ADHUNIK under National Professor Dr. Md. Nurul Islam, President of CUET unit of Sondhani (Blood donor club). Currently, he is a member of doctoral committees of a university, external examiner of another university, and involved with operating two educational institutions.

Evening Keynote Day One

# Optimization and Optimal Control Technique: Applications to Modeling Healthcare Systems

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## Abstract

Healthcare for the growing population worldwide has become major concern because of the increasing threats of infectious diseases and their rate of mortality in the age of climatic change. The optimal management of therapeutic treatment and the huge systematic costs of healthcare have become challenge for the healthcare providers [6]. The simulation based optimization and optimal control is a technique used to efficiently find solutions to problems of healthcare systems which seeks to maximize or minimize the performance measures of the healthcare by manipulating the state variables under certain restrictions known as constraints. The dynamic optimization is crucial to characterize all aspects of global change dynamics, from the Earth's climate system [3,7] to human physiology [7]. These nonlinear phenomena of rapid change over the glove as well as in the human physiological systems can be captured and modeled by the nonlinear ordinary differential equations (NODEs) in the form of mathematical modeling [1-5]. Since human body is a highly nonlinear, robust, and an adaptive physiological control system, there is a close relationship between control theory and biology [7]. So nonlinearity plays an influential role in describing the behavior of complex dynamical systems and the mysterious mechanisms of the infectious diseases in human body.

In recent years, mathematical models have become important tools in analyzing and describing the changing dynamics of biological and biomedical systems. The processes in biology and medicine can be, in general, described by mathematical models where the nonlinear ordinary differential equations are the key ingredients. Optimal control technique fuels on such analysis in obtaining the optimal control strategies in the form of Pontryagin Maximum Principle. This technique provides new results by applying the old theories. In this talk, we address some of recent developments of modeling the nonlinear behavior of the complex dynamical systems arising in biology and medicine. Optimal control technique with constraints can be of advantageous to obtain the better strategy as a special feature in some cases. Numerical treatment is performed to illustrate the results.

**Keywords**
Optimization, Optimal control, Mathematical modeling, Healthcare systems, Numerical simulations

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## Biography

**Dr. Haider Ali Biswas** is currently affiliated with Khulna University, Bangladesh as a Professor of Mathematics under Science Engineering and Technology School and currently holds the position of the Head of Mathematics Discipline. Prof. Biswas obtained his B Sc (Honors) in Mathematics and M Sc in Applied Mathematics in the year 1993 and 1994 respectively from the University of Chittagong, Bangladesh, M Phil in Mathematics in the year 2008 from the University of Rajshahi, Bangladesh and Ph D in Electrical and Computer Engineering from the University of Porto, Portugal in 2013. He has more than 17 years teaching and research experience in the graduate and post-graduate levels at different public universities in Bangladesh. He published three books, one chapters and more than 70 research papers in the peer reviewed journals and international conferences. Prof. Biswas has worked at several R & D projects in home and abroad as PI and/or Researcher. His present research interests include Optimal Control with State Constraints, Nonsmooth Analysis, Mathematical Modeling and Simulation, Mathematical Biology and Biomedicine, Epidemiology of Infectious Diseases. He is the life/general members of several professional societies and/or research organizations like Bangladesh Mathematical Society (BMS), Asiatic Society of Bangladesh (ASB), Institute of Mathematics and its Applications (IMA), UK, European Mathematical Society (EMS) and Society for Mathematical Biology (SMB). Dr. Biswas was the General Secretary of Mathematical Forum Khulna in 2013-2015. Dr. Biswas organized several national and international seminars/workshops/conferences in home and abroad and he has been working as editor/member of editorial boards of several international peer-reviewed journals including '*Ganit'*- Journal of Bangladesh Mathematical Society. Recently Professor Biswas has been nominated the Member of the Council of Asian Science Editors (CASE) for 2017-2020 and the Associate Member of the Organization for Women in Science for the Developing World (OWSD) since 2017.

Morning Keynote Day Two

**Disruptive Innovation and Industry 4.0**

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Abstract

Disruptive innovation has contributed to the current digital technology based services and products. It caters to the segment that was earlier left behind and thus builds a new market with remarkable quality close to the existing top providers. Then fourth industrial revolution aka Industry 4.0 has come now which ushers a new era for innovation. Since this phenomenon is based chiefly on knowledge capital like artificial intelligence and machine learning, it gives huge opportunities to people all around the world irrespective of economic status to take part in the all aspects of progress and prosperity.

**Keywords**
Innovation, Industry 4.0

**Biography**

**Dr. A R M Harunur Rashid** is an Associate professor of Department of Mechanical and Production Engineering (MPE) at the Islamic University of Technology (IUT). He earned his PhD from Dublin City University (DCU) and B.Sc. in Mechanical Engineering from Bangladesh University of Engineering and Technology(BUET). His research activities include the area of Ergonomics, Engineering Design, Management, Operations Research and Renewable Energy. He has been serving as Honorary General Secretary of IEOM Society of Bangladesh since 2016.

Morning Keynote Day Two

# Occupational Health &Safety (OHS) and Productivity Improvement in RMG Industries – A Lesson Learned for Sustainable Development

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## Abstract

The objective of readymade garments (RMG) is to improve the productivity and competitiveness of RMG industry in Bangladesh while simultaneously improving OHS and ergonomic conditions. In order to reach this objective the research strives towards gaining new knowledge about the dynamics among the major stakeholders in respect to co-development of sustainable OHS and productivity advancements. This research has identified the positive synergies between productivity and OHS conditions after analyzing baseline data collected from fifty RMG industries. The integrated Lean and OHS model for sustainable productivity improvement has developed for the intervention process and implemented in twelve RMG industries with positive outcomes as expected. The final phase of baseline data collected from these fifty industries for comparison between intervening and non-intervening industries in the journey of ensuring sustainable productivity. The research capacity in Bangladesh is strengthening by initiating and institutionalizing this novel research domain which eventually applicable to many countries.

**Keywords**
RMG, OHS, Ergonomics, Productivity, Sustainability

**Biography**

**DrSarwarMorshed** is a Professor of Industrial and Production Engineering at the Faculty of Engineering, Ahsanullah University of Science and Technology (AUST). He started his academic career in Chittagong University of Engineering and Technology (CUET) in early 90s after receiving his undergraduate degree in Mechanical Engineering. He received his Masters in Industrial Management from the Centre for Industrial Management, Katholieke University of Leuven, Belgium and received his PhD in Manufacturing and Mechanical Engineering from the Birmingham University, UK on Optimization and Scheduling. He worked in the Birmingham University as PhD researcher before his post-doctoral research in Coventry and Bath University. He also served as a visiting academic at Bath University and affiliated as a Visiting Research Fellow at Aalborg University, Denmark. He has supervised many undergraduate, masters and PhD students further to his contribution in leading academic and research positions and course curriculum developments in past years. He has published 38 articles in several journal and conferences. He has been working as a Senior Researcher and Deputy Project Leader of Aalborg-AUST Research Project (POHS-BD) and collaborative work among AUST, Aalborg University and BGMEA since 2015. A sustainable maturity model has been developed by integrating lean and OHS for intervention process in RMG industries. He also developed Muti-objective knowledge based scheduling techniques using genetic algorithm (GA) for cancer patients in dynamic situation along with his hybrid GA framework for industrial and service scheduling. Prof Morshed has affiliations with HEA (UK), OR Society, IEOM Society and IEB.

Morning Keynote Day Two

# Technological Innovation and Management for Industry 4.0 for Sustainable Development

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## Abstract

The purpose of this paper is to provide knowledge and competency about the modern system of management process and how to deal with the competitive market by going through the legal procedures of the business policies by Technological Innovation and Technology in the Industry 4.0 for Sustainable Development perspective. The goal of this paper is also to provide competency based skill to enable to takes an innovative and creative view of information technology that extends beyond the province of business applications built and used by a single organization. An organization can commercialize their technological innovations and how the associated risks and benefits might be managed. Through the open innovation paradigm, and see how internal and external ideas can be brought together and innovations can be transferred inward and outward through licensing, joint ventures and spin-offs to meet Industry 4.0 Challenges.

**Keywords**
Industry 4.0; Value Creation System; Technology and Innovation; Understanding the Selection of Technology; Technological Systems Components; Technology and Society; Technology and Environment and Transfer of Technology

## Biography

**Dr. Rashid** is Bangladeshi National, Author, Researcher, Academician, Mechanical Engineer, Trainer, Lawyer, Social Worker and Consultant in the field of Engineering Management, Project Management, Quality Control and Supply Chain Management, Occupational Health Safety and Productivity last 26 years. He has been serving as a Senior Management Counsellor and Head of Production Management Division at Bangladesh Institute of Management (BIM), Dhaka since 16 February 2004. He had been serving as a Faculty Member of Industrial Engineering Department from September 18, 2016 to July 17, 2017 (on lien from BIM). As a faculty he has been facilitating for the Graduate and Professional training program around 100 in the areas of TQM, HRM, Compliance of ISO9001:2015, SA8000, WRAP, ISO 14001:2015, OHSAS 18001:2007, Productivity and Competitiveness, Project Management with MS Project-2013, PMP preparation Course, Project Financial Analysis and Management, Integrated Management System, Supply Chain Management and Industrial Safety Management at BIM and outside of BIM. He also worked as adjunct faculty @ 10 universities i.e. Jahangirnagar University, BUP, AUST, IEB, DIU (three), BOU, IBAISU, BUBT, BUET, IPM, DIPTI, Planning Academy and Research Team Member for OHS and productivity improvement project of AUST-AAU for RMG in Bangladesh. Prior this job he worked as a Mechanical Engineer of Jamuna Fertilizer Company, Bangladesh for around seven years. He obtained BSc in Mechanical Engineering degree from RUET (erstwhile BITR) on dated November 27, 1993 with First Class and 8th position, MSc in Mechanical Engineering degree from BUET on dated December 28, 1996 and MBA degree from BOU in 2004. He completed a Diploma in Computer Science and Applications (BOU), a PGD in Human Resource Management (IPM), a Post Graduate Diploma in Marketing Management (BIM), LLB (NU) and LLM (BUP). Currently he is pursuing final semester for MSS in Industrial Relations and Labor Studies from ISWR of Dhaka University on Session 2018-2019. He also completed Management Accounting, Project Management, Technology Management, Safety and Maintenance Management, Information Technology in Business and Artificial Neural System courses in Graduate level study at Industrial and Production Engineering Department of BUET. He has around 56 publications in renowned Journals (28); International Conferences (28), a book on Industrial Health Safety and Welfare and a book on Product Development. He also obtained Doctor of Engineering in Manufacturing Engineering degree under Bangabandhu Fellowship program of GoB at Kitami Institute of Technology, Japan on March 18, 2013. He also awarded the Scholarship from class IX-X, HSC, BSc Engineering and MSc Engineering degree from GoB. His journals are indexing almost Universities of the world. He is also attended around 50 short courses from nationally and internationally (Singapore, Nepal, KL-Malaysia, Riyadh-KSA and Hyderabad). He is around supervised 250 Safety Audits through students and safety related term paper/project around 200. He is member of the following professional organization/body: IEB, JSPE, BSME, BSTD, IPM, IEOM and BCS.

Morning Keynote Day Two

# Integration of Sustainability within Textile Engineering Curriculum of Bangladesh-A Prime Need and Achievement

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## Abstract

At present, the Textile Industries of Bangladesh is contributing positively for keeping up its sustainable economic growth. To make the textile industries sustainable through achieving the United Nations Sustainable Development Goals (UN SDGs), the quality enhancement of Textile Engineering education is the great concern for producing skilled textile graduates. This talk will provide an overview of recent research work on the sustainability gapsthat are exist in the present textile engineering education of Bangladesh and identification of the relevant sustainability issues for incorporating with the existing syllabus in order to reduce the gaps.The outcome of this research work might be helpful for the academics and policy makers to take the necessary steps towards enhancing the quality of textile engineering education for producing skilled textile graduates.

**Keywords**
Textile Engineering, Education, Sustainability, Curriculum, Integration

**Biography**

**Prof. Dr. Lal Mohan Baral** is an experienced qualified Textile Educationist with over 16 years of experience in providing the vision and teaching required to ensure a high quality of education for pupils. He is a committed and dedicated professional with a proven ability to teach, motivate and direct studentsby encouraging with a positive attitute to maximize their performance.Dr. Baral is a professor and ex-headof Textile Engineering Department at Ahsanullah University of Science and Technology, Bangladesh. He did his PhD in Engineering and Management (2014) from LBUS, Romania and M.Sc. in Textile and Clothing Engineering (2003) form Technical University of Dresden, Germany. His research interest includes textile manufacturing process & quality control, Six Sigma and Knowledge Management, Sustainable curricular development for engineering education. Dr. Baral has published significant number of scientific papers and also served as a reviewer in different reputed indexed journals. He also served as an editorial board member of International Journal of Quality Assurance in Engineering and Technology Education (IJQAETE) published by IGI Global publications. Prof. Baral has been working as a Researcherof Aalborg-AUST Research Project (POHS-BD) which has been funded by DANIDA and collaborative work among AUST, Aalborg University and BGMEA since 2015. He has also coordinated a number of projects on Problem based and Project based learning (PBL) methods and Sustainable curricular development with the aim to enhance the quality of textile engineering education and presented several scientific papers in different international conferences on those topics. Prof. Baral is a course evaluator of textile engineering education nominated by Board of Accreditation for Engineering and Technical Education (BAETE), Bangladesh. Recently (March 05-07, 2019),Dr. Baral has organized an International Scientific Conference on Sustainability of Global Garment Industry (ICSG2i-2019) in Bangladesh. Dr. Baral received best Professor award 2019 in Textile Engineering studies of Bangladesh announced by World Education Congress, CMO Asia chapter.

**Paper ID: 1**

## A Case Study on Optimization of Production Process in a Textile Industry

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### Abstract

Textile industry has prominence globally and locally. Also it has a vast relation with RMG(Ready Made Garments) production in Bangladesh and other countries, which is earning lot of foreign remittance for the economic development for the country.There are many segment and factors involve in the whole production process. Therefore, it will be effective and economical if key segments and factors could be identified for optimization. To do so, a case study was conducted in a textile industry located in Dhaka, Bangladesh and the findings are reported in this paper.

**Keywords**
Lean Manufacturing, Operations Research, Process Optimization

**Paper ID: 2**

## Mathematical Modeling of Friction on the Cutting Zone during Orthogonal Cutting

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### Abstract

In this work, effects of friction on the machining process during orthogonal cutting are theoretically investigated. Mathematical models were developed to predict the effects of friction and cutting force on the machining process. The results showed that the coefficient of friction increased with increased cutting forces, cutting stress and temperature. The frictional stress decreased as the exponent (P) increased. However, the frictional stress increased as the coefficient of friction increased. Also, study revealed that as the temperature increased, the flow stress decreased. Furthermore, it is shown that as the feed speed increased, there is an increase in the flow stress of the material used. The cutting force increased with increasing the feed rate, depths of cut but decreased with increasing cutting speed. This work will enhance the influence of friction on the cutting process and also assist in the development of good products with good surface finish.

**Keywords**
Advance manufacturing process, Industrial Engineering

**Paper ID: 3**

# An Exploration of Differences between Professional Advancement of Project Managers based on their Gender in Operations-Driven and Project-Driven Organizations

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## Abstract

This paper discusses results of an exploratory study conducted on project and operations managers. The study aims to investigate the difference between the professional advancement of project and operations managers based on their gender. It also attempts to discover the preferred ways of career progression in project driven and operations driven (project dependent) organizations. The key objective of this work is to formulate refined research questions for the research community based on the results of our research work.

**Keywords:**
Career; Gender; Project managers; Operations managers; Project-driven organizations; Operations-driven organizations

**Paper ID: 4**

# Boiler Manufacturing Scenario in Bangladesh

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## Abstract

A boiler or steam generator is a closed vessel used to generate steam by transferring heat energy to water. According to Bangladesh Boiler act 1923 boiler means any closed vessel exceeding 22.76 liters in capacity which is used expressly or generating steam under pressure and includes any mounting or other fitting attached to such vessel, which is wholly or partly under pressure when steam is shut off. Prior to 2007 there were no boiler manufacturing companies in Bangladesh. At that time Bangladesh export boiler from china, UK, India, Germany, USA, Taiwan, etc, as a result Bangladesh lost huge amount of foreign currency. According to Bangladesh Boiler Regulation (BBR) 1951 to manufacture a boiler heat treatment was mandatory. After amendment of BBR at 2007 heat treatment waived for small industrial boiler and private sector started to manufacture boiler. Now many company managed heat treatment arrangement and produce large boiler of up to 10 ton/hr besides of small industrial boiler. But they cannot produce boiler according local demand. Boiler uses most of the industries for their process work or electricity generation purpose. Bangladesh is growing up industrially day by day as a result development of boiler manufacturing sector is mandatory.

**Keywords**
Boiler, Boiler Manufacturing, Inspection authority,Manufacturing statistics in Bangladesh, Manufacturing company

**Paper ID: 5**

# Common Mistakes in Boiler Operation & Maintenance (Perspective Bangladesh)

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## Abstract

Recently Bangladesh has been graduated least development country (LDC) to developing country. Bangladesh has already established eight export processing zones (EPZ). Bangladesh Economic Zones Authority (BEZA) has till August 2019 got approval to establish 88 economic zones countrywide. For attracting foreign investors it is big challenge for government to create congenial environment in industrial sector as well as ensure proper industrial safety. Boiler is a most common risky technical pressure vessel usually used in textile sector, Power plant, Fertilizer company, Sugar factory, Auto rice mill, Feed Mill, Medicine factory, lather industry, hotel, hospitals etc. Improper operation & maintenance of boiler is responsible for accident. Many users do not know how to operate boiler safely & efficiently. They do not maintain Standard operating & maintenance procedure of Boiler. Due to lacking of knowledge & experience boiler accident occurs with loss of live & property. As a result, industrial safety hampers and we loss country image to foreign investors. This research has identified the common mistakes & take necessary action to overcome such mistakes in Boiler operation & maintenance after analyzing base line data collected from approximate five hundreds (500) boilers inspection which are located different districts in Bangladesh.

**Keywords**
Boiler faults, Boiler Operation, Boiler Maintenance, Boiler Inspection, Industrial safety

**Paper ID: 6**

# Problems and Prospect of Textile Industry in Bangladesh

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## Abstract

The largest industrial sector of Bangladesh is garments Industry. The history of garments industry in Bangladesh is not an older one rather it had been renowned all over the world from the period Mughal emporium. Dhakai muslin is still in the mind of people. Especially in the European market, it has globally reputed and has well demand. For last 25 years Bangladeshi Garments Industry is the largest sector with 5 billion foreign currencies by exporting garments products. It makes the employment about 3 million workers and 90% of them are women, which in fact helps in a large section to employment of women *(Bangladesh Centre for Worker Solidarity,2011 )*RMG sector is helping to generate revenue of 6 billion dollar yearly for this developing country. This is the single major sector of Bangladesh which is helping continuously to more development of our country. This sector is already treated with care by the government, but by recent issues it is shown that this sector is not going appropriately. There is even better chance to develop the sector as well as our country, but due to some unavoidable reasons, the sector is now endangered by various causes. Whatever, it's never so late to start again. So if appropriate intensive care for the sector can be taken exactly from right now, this is a single sector that can change the base of our country.

**Keywords**
Textile Engineering

**Paper ID: 7**

# Analysis of National Skills Development Policy of Bangladesh-2011: Problem & Prospect

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## Abstract

National Skills Development is an integral part of development agenda. Bangladesh is a developing country; "Remittance" is its bone of economy. But, when our neighbor country maintains communication by 'satellite,' send rocket in the air force, take news and views from lunar module or lunar dust by robot, then we have to satisfy by 3G connection. Malaysian Engineering Universities provide 50000 Engineer per year, some students of many countries admit into their university completing TOEFL, GRE, and then University of Dhaka can't full its fixed seat with qualified student. It is not deniable that it has a small territory, weak man power, limited economy, and limited natural resources. The main cause of this backwardness is the lacking of human skills development. However, Recently the Government of Bangladesh has been implementing various programs in the sectors related to human skills development like education and technology; health and family welfare; women and children; social welfare; youth and sports development; culture and labor and employment. Government has taken steps to create efficient and competent human skills to increase economic growth and poverty eradication. By the way of upgrading the quality of education and creating enrolment opportunities at secondary, higher secondary, technical and all levels of higher education, various programs have been adopted.

**Keywords**
Skill Development, Human Resource

**Paper ID: 8**
**Security Compliance Study**

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**Abstract**

Security Compliance is a legal aspect that continuously monitors how internal and external factors affect the achievement of goals and ultimately the success of the security compliance. In this paper, security compliance in organizations is studied.

**Keywords**
Security Compliance, Human Resource

**Paper ID: 9**

# Major Barrier to Industrialization in Bangladesh

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## Abstract

The importance of the textile industry in the economy of Bangladesh is very high. The garments manufacturing sector earned $19 billion in the year to June 2012, one of the impoverished nation's biggest industries. Currently this industry is facing great challenges in its growth rate. The major reasons for these challenges can be the global recession, unfavorable trade policies, internal security concerns, the high cost of production due to increase in the energy costs, different safety issues specially fire, etc. Depreciation of Bangladeshi Taka that significantly raised the cost of imported inputs, rise in inflation rate, and high cost of financing has also effected seriously the growth in the textile industry. As a result neither the buyers are able to visit frequently Bangladesh nor are the exporters able to travel abroad for effectively marketing their products. With an in-depth investigation it was found that the Bangladesh textile industry can be brought on top winning track if government and others individuals takes serious actions in removing or normalizing the above mentioned hurdles. Additionally, the government should provide subsidy to the textile industry, minimize the internal dispute among the exporters, withdraw the withholding and sales taxes etc. Purchasing new machinery or enhancing the quality of the existing machinery and introducing new technology can also be very useful in increasing the research and development (R and D) related activities that in the modern era are very important for increasing the industrial growth of a country.

**Keywords**
Industrialization, Production Management

**Paper ID: 10**

# Organizational Readiness for introducing a performance Management System

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## Abstract

The aim of this study was to report the results of the organizational diagnosis the researchers conducted to determine the readiness of the organization to introduce a Performance Management System. This study investigated the extent to which employees of a selected organization were ready for a new PMS. The researchers used a quantitative, questionnaire-based design. A sample of 460 employees completed a change readiness questionnaire to elicit perceptions and opinions about change readiness and the introduction of a new PMS.

**Keywords**
Management Information Systems, Industrial Management

**Paper ID: 11**

# Designing and Organizing a Training Course in an Organizations

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## Abstract

The main purpose of this research paper is to understand how the designing and implementation of training programs takes place within organizations. Training is referred to as any planned activity that is used to transfer or modify the knowledge, skills and attitudes through learning experiences. There are numerous reasons regarding which the personnel are required to undergo the training programs. They need to maintain the levels of competence respond to the demands of the changing circumstances and implement new approaches and technologies. Policies, procedures, norms and principles are required to be taken into consideration in the designing and implementation of training programs. Training programs are usually put into framework of bringing about continuous improvement in job performance. Changing and improving practices require an environment that is conducive to work, appropriate learning resources and continuous use of motivational strategies. Training programs should be based upon abilities to meet the required standards.

**Keywords**
Adult Learners, Designing, Implementation, Learning Methods, Organizations

**Paper ID: 12**

# Analysis of Natural Convection Heat Transfer from Slender Body in a Channel

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## Abstract

For the purpose of heating and cooling, natural/free convection is one of the cheapest methods. When fluid flows inside a channel and if there remains a temperature difference between fluid and solid surface, heat transfer takes place by convection heat transfer mechanism. After taking heat from the heated object, fluid density decreases and it lifts up due to buoyancy force. Thus a vacancy is created which is filled up by relatively cooler fluid with relatively larger density. In our analysis, the flow is considered two dimensional, steady-state, incompressible, laminar and all physical properties are assumed to be constant through the channel with a heated slender body. Effects of Rayleigh number, Prandtl number, locations of slender body and aspects ratios have been observed in the paper. Maximum temperature occurs at the vicinity of slender body. The average Nusselt number slowly decreases with the increase of Rayleigh Number but the average Nusselt number remains constant for the range of Prandtl Number investigated. Slender body average Nusselt number decreases initially but becomes minimum at the middle portion of the channel and then increases when the slender body is moved from location 1.0 to 6.0.

**Keywords**
Natural Convection, Rayleigh and Prandtl Number, Slender Body, Aspects Ratio, Nusselt Number

**Paper ID: 14**
# The Hidden Costs of Servitized Business Models

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## Abstract

As manufacturer's transition to service focused strategies, they face "hidden costs" that cannot be quantified. This paper uses an exploratory multiple case study approach to analyse this issue by unraveling the drivers of hidden costs in implementing performance based contracts (PBCs). Five PBCs in the UK defense sector were selected. The analysis of empirical findings reveals four major drivers of hidden costs - supplier relationships, contract complexity, customer relations and cost estimation problems. The analysis also unearths the interaction between the experience of offering PBCs, the hidden cost drivers and the different stages of PBCs. The study provides a framework for studying the impact and types of hidden costs for different PBC stages and supply chain members.

**Keywords**
Service Industry, Business Models

**Paper ID: 15**

# Characteristics Analysis of Laser Beam Machining Process

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## Abstract

Machining is one type of process in which metal removing, surface making, and surface finishing etc. are done. Two types of machining processes are used: nonconventional and conventional machining process. Machining of harder materials and of complicated shapes is difficult, wasteful and, time-consuming by conventional methods of machining. Nonconventional machining process is very popular for machining at the moment. Laser beam machining is one type of mechanical nonconventional machining process. Since the laser is the source of energy in laser beam machining, it is possible to focus optical energy on the surface of the work piece. A portion of the work piece is melted and evaporated in a manner by the highly focused high-density energy. Some aspects of laser beam machining process i.e. features of laser beam, manipulation of laser beam, principle and different processes of laser beam machining, process analysis, characteristics of cut front and cut surface etc. have been theoretically studied. Effect of different parameters on the LBM process like cutting speed, polarization of laser beam, wavelength of laser beam, focusing of laser beam, assist gas, gas nozzle, work piece thickness, work piece material etc. have been analyzed. The efficiency of material withdrawal mechanisms has a pivotal influence on the quality and performance of the laser cutting process. However, they are not so easy to understand since the physical processes and parameters, which govern them, are very complicated to observe and measure experimentally. The development of theoretical models for analyzing the material withdrawal mechanisms is very necessary to understand the characteristics and influence of these processes. For this reason, a mathematical model for the material withdrawal rate of laser beam machining process has been developed.

**Keywords**
Machining, Material withdrawal, Theoretical model, Mathematical model, Characteristics

**Paper ID: 16**

# Employee Health, Safety & Accident in Pharmaceuticals Industry in Bangladesh

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## Abstract

The main objective of our study is to understand the perception of employees regarding industrial safety management system. As well as to understand the how the conceptual and theoretical knowledge of safety management system make impact on productivity of an organization.

**Keywords**
Occupational Safety, Human Resource Management

**Paper ID: 17**
# Legal framework for the industrial relation system in Bangladesh

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## Abstract

The soviet industrial relations system was marked by the extent to which the rights and responsibilities of employees and the trade unions were enshrined in law, with the Labor Code providing a comprehensive framework of regulation of the terms and conditions of labor and extending unprecedented rights and protection to trade union bodies, while the plan and collective agreements enjoyed juridical status. The Soviet Union prided itself on the fact that the legal rights and protection accorded to labor were the most advanced in the world. But this progressive appearance concealed a variety of features less favorable to workers. First, detailed legal regulation was required precisely because the Communist Party was not prepared for voluntary joint regulation of employment to take place. The latter would have entailed granting autonomy to workers' organizations and employers and thus would have challenged the Party's political monopoly. Second, the law by no means constituted an obligatory framework for labor relations: instead, it served as a discretionary instrument for confining managerial authority within the limits of Party policy. Finally, legal protection, and the role of the trade unions in monitoring the observance of workers' legal rights, was not defined in terms of the protection of workers' interests but in terms of the need to develop the productive powers of labor.

**Keywords**
Legal Framework, Human Resource Management

**Paper ID: 18**

# Determination of Demand Forecasting Techniques Applicable for Electronics Product (Cell Phone) and Comparative Analysis

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## Abstract

Forecasting is an integral part of demand management since it provides an estimate of the future demand and the basis for planning and making sound business decisions in order to enable better planning and utilization of resources. To survive in the competitive market of mobile manufacturing, each company must follow a demand forecasting strategy of their own to sustain. In this concern, this research has been conducted in six cell-phone retail stores with the aim of determination of demand forecasting techniques applicable for cell phone.For this, the data were collected for a cycle of six months in the year of 2018. The qualitative forecasting technique was used by the retail stores as their current forecasting technique. Then the different time series smoothing forecasting techniques have been appliedand based on the lowest MAD value, the best forecasting technique was selected. Through analysis, it has been found that for popular cell-phone models about 50% are fitted tosingle exponential smoothing, 33% are fitted todouble exponential smoothing, and 17% are fitted to naive forecasting. In the same way, it has been found that for general cell-phone models about 33% are fitted to double exponential smoothing, 33% are fitted to naive forecasting, 17% are fitted to single exponential smoothing, and rests are fitted to three months moving average. For cumulative forecasting, it has been revealed that double exponential smoothing is best suited for both popular and general cell-phones. Finally, some recommendations for the studied organizations are suggested to improve the forecasting strategy of the organizations.

**Keywords**
Cell phone, Demand forecasting, Forecasting techniques, MAD.

**Paper ID: 19**

# Study and Evaluation of Inventory Management System of Pharmaceutical Products in a Healthcare Service Facility

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## Abstract

Hospital expenditure is increasing day by day in Bangladesh, where inventory related cost is remarkable. Proper inventory management technique can reduce the cost drastically. The objectives of this research were to analyze the current process of drug inventory control and to find possibility for improvement. Therefore, this paper serves as a proposal to propose the feasible improvement to the pharmacy department. Different inventory methods such as ss, ROP, EOQ, joint ordering strategy and tailoring of joint ordering were presented and explained. Nine drug groups are generated by coupling ABC and VED analysis. Then, inventory models are analyzed for ABC-VED matrix. The results of this thesis presented two primary steps for implementing drug inventory control. The study can propose the possibilities to improve drug inventory management in the hospital pharmacy. After exploring and analyzing the hospital pharmacy store, the main concerns were related to purchasing process. It was found that reorder point and order quantity were determined based on arbitrary policy. Findings of this thesis regarding inventory control showed that items in the pharmacy store should be classified and prioritized. The matrix retrieved from the combination of ABC-VED methods can ease up the inventory management by narrowing down number of items that need special attention and high-level management.

**Keywords**
Inventory Management, Operations Research

**Paper ID: 20**

# A Study on Technological Change and Automation in Bangladesh

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## Abstract

The study looked into the overall conditions of technology changes and automation system in Bangladesh. Respondents were interviewed through a set of a structured questionnaire. A total of 50 executives were selected from different sectors were interviewed and selected randomly of the selected sectors. Technology and Automation system makes human life easier. In our daily life, we cannot move or survive without technology. In the world, technology is changing dramatically in the different sector every day. In Bangladesh, the technological changes and automation systems are increasing day by day. The community at large is fast realizing the need and importance of science, technology and automation which increase productivity, performance, smoothness and decrease system lost, time-consuming etc. The study of the application of the changes technology in different sector of Bangladesh shows that many sectors are well equipped and technology based. They are getting benefit by using technology. And some sectors are not adapting technology as others like. The study looked into the present conditions and Implementation in the different sector of Bangladesh. In future a number of changes have taken place. These includes among others, globalization of the economy, market diversification of the technology, Govt. initiatives, Private initiatives.

**Keywords**
Technology, Automation, ICT, Robotics, Artificial Intelligence

Paper ID: 21

# Eliminating Bad Work Posture by Proposing an Alternative Ergonomic Workstation Design in the RMG Industry

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## Abstract

On the edge of being recognized as a developing country, Bangladesh now holds the 39th position in the world economy in nominal terms. And this achievement has been possible for the active contribution of readymade garment (RMG) sector. In 2019 Readymade garment (RMG) sector has contributed 84.21% or $34.13 billion to the total export receipts. Growing market amenities, abundant & efficient workforce at low cost, duty benefits in export destinations are some of the vital reasons for the success of the RMG sector in Bangladesh. According to a survey conducted by the Centre for Policy Dialogue (CPD) in 2019, there are 3.5 million workers, of which 60.8% are female and 39.2% are male working in 3,596 active RMG factories. Minimum monthly wages in Bangladesh is $ 95 where China is $ 155, Cambodia $ 140, India $ 137, Vietnam $ 107. But the environment at which these workers are working is not good for their health as well as production. Workers face severe pain as a result of their bad posture and unnecessary movement.To remedy the situation, the design of an alternative workstation is proposed which is more ergonomic, worker-friendly. Necessary anthropometric measurements are used. SOLIDWORKS & ARENA are some software used in this perspective.

**Keywords**
Ready Made Garments, Ergonomics, Workstation, Economy, Anthropometry

## Paper ID: 22
## Reduction of Power Consumption in Gas Booster Compressor

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### Abstract

Currently in Bangladesh, a large number of natural gas fired CCPPs have been constructed. They require natural gas pressure from 32 bar to 47 bar at gas turbine inlet. In Bangladesh, natural gas distribution companies signs Gas Supply Agreement with power plants to supply gas at 10 bar pressure. So obviously a gas booster compressor is required. So all power plants should install constant speed integrally geared centrifugal gas compressor for this purpose. But in reality, at power plant RMS inlet, there is varying gas pressure ranging from 16 bar to 40 bar. In addition, power plants must run at variable load. So gas consumption also varies. So if gas is supplied at transmission line pressure into plants and variable speed multistage centrifugal gas compressor is installed for gas pressure boosting purpose then a large amount of power can be saved.

**Keywords**
Energy, Heat Transfer, Power Generation

## Paper ID: 23
## Sustainable Conventional Electricity Generation

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### Abstract

Electricity generation cost has two components: capacity charge and energy charge. Energy charge is solely dependent on technology. But capacity charge vastly depends on project management. Capacity charge has three major components: return on investment, salary of employee and scheduled maintenance cost (including insurance premium). Currently capacity charge for natural gas fired CCPP in Bangladesh, accounts for 50% of total tariff. So reduction in power plant capacity charge will make convention electricity generation significantly sustainable.

**Keywords**
Energy, Power Generation

**Paper ID: 24**

# Experimental Analysis CFRP Drill Hole Quality Based on Pre-Hole & Force

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## Abstract

Carbon fiber reinforced polymers (CFRP) are stronger and lighter materials in the aerospace industry, instead of titanium and aluminum. The excellent strength-to-weight and stiffness-to-weight properties of composite materials are the main drives of increasing the ratio of the composite parts in aircraft.Less weight on aircraft means less amount of fuel consumption. Subsequently, aircraft can able to fly longer range with higher speeds and more efficiently. As a result, it is a more economical and environmentally friendly condition, which gives the product value and competitiveness for the aircraft manufacturer. During CFRP laminate joining manufacturing activities, delamination is one of the major forms of failure in drilled materials. In this research, a comparative study of drilled hole quality after drilling without pre-hole and pre-hole with three different diameters on CFRP has been made. Two types of different geometrical drill bits were used for the drilling process. The ultrasonic scan images were taken into account to determine the surface delamination.

**Keywords**
CFRP, Twist drill, Step drill, Ultrasonic Scan, Pre-hole and Hole quality

**Paper ID: 25**

# Development of an Innovative Fireball Fire Extinguishing System

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## Abstract

Industries are facing a lot of fire based accidents these days. As a result, massive losses of lives as well as money are suffered by the owners. The conventional fire extinguishing systems are found to be not enough to reduce losses, let alone eliminating them. Everyone is familiar with the fact that the huge fires originate from very small sparks or pretty little fires which are very easy to control. So, we tried to work keeping the fact in mind that we can easily control these small fires at the initial phase. By using the conventional fire extinguisher, it is not always possible to extinguish small fire. One of the major reasons of this inability is the manual handling nature. So, we worked with the automatic exciting equipment and tried to improve them in order to extinguish the small fire at a very initial stage. This is expected to lead us in a success in preventing huge fire that will cause massive losses. In our research project, dry powder is used as fire extinguisher known as ABC dry chemical powder. A stands for ash, B stands for barrel while C stands for current. The powder is usually a mix of monoammonium phosphate and ammonium sulfate, the former being the active one. The mix between the two agents is usually 40–60%, 60-40%, or 90-10% depending on local standards worldwide. An innovative fireball fire extinguisher system has been developed using this powder to extinguish fire quickly and conveniently.

**Keywords**
Occupational Safety, Safety Engineering, Product Design

**Paper ID: 26**

# Effects of Environmental and Safety Factors on Productivity of RMG Industry in Bangladesh: A Survey-Based Approach.

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## Abstract

The Ready Made Garments (RMG) industry is the only multi-billion dollar manufacturing and export earning industry in Bangladesh. This industry contributes 83% of the country's total export earnings which was 18% of total GDP in 2016. Productivity, which reflects the efficiency and effectiveness of an organization in transforming its inputs into outputs, is very crucial for this industry. Since most of the RMG workers have a little and sometimes no formal education, productivity factors associated with environmental and safety factors gains less attention. This study focuses on assessing and quantifying the effects and relationship of Ergonomics, Health Safety & Environment (HSE), and Occupational Health & Safety (OHS) on workers' productivity in the selected RMG factories. A structural questionnaire has been used for data collection. Expected outcomes of this study are: (i) Ranking of the factors by their contributions to the productivity, (ii) Individual effect of the factors on productivity, and (iii) the relationships among the factors and the productivity of RMG industry in Bangladesh. This outcomes will be helpful to concern policy maker and factory owners about the importance of Ergonomics, HSE and OHS and to provide a sustainable safety environment to the workers for improving productivity.

**Keywords**
Ready Made Garments, Safety, Productivity

**Paper ID: 27**

# World Trade Organization Rules on Sanitary and Phytosanitary Measures: Bangladesh Perspective

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## Abstract

The World Trade Organization (WTO) is the only global international organization dealing with the rules of trade between nations. While, WTO rules help to ensure that these products are traded safely and that health protection measures are not used as an excuse for protecting domestic producers. In this perspective, this thesis aims to meet two basic questions, these are how to work SPS measure agreement and what are the challenges and opportunities of SPS measures for market access implications. The research method is based on explorative research of inquiry. The agreement on the application of sanitary and Phytosanitary measures sets out the basic rules for food safety and animal and plant health standards. It allows countries to set their own standards. The basic aim of the SPS Agreement is to maintain the sovereign right of any government to provide the level of health protection it deems appropriate, but to ensure that these sovereign rights are not misused for protectionist purposes and do not result in unnecessary barriers to international trade. The SPS Agreement, while permitting governments to maintain appropriate sanitary and Phytosanitary protection, reduces possible arbitrariness of decisions and encourages consistent decision-making. It requires that sanitary and Phytosanitary measures be applied for no other purpose than that of ensuring food safety and animal and plant health. In particular, the agreement clarifies which factors should be taken into account in the assessment of the risk involved. This agreement is fully applicable in Bangladesh. Measures to ensure food safety and to protect the health of animals and plants should be based as far as possible on the analysis and assessment of objective and accurate scientific data. The SPS Agreement encourages governments to establish national SPS measures consistent with international standards, guidelines and recommendations. This process is often referred to as harmonization. Sanitary and Phytosanitary measures sometimes vary, depending on the country of origin of the food, animal or plant product concerned. The WTO itself does not and will not develop such standards. Therefore, the findings of this thesis can more trades in the products to impose SPS measures and achieve significance economics gains in Bangladesh.

**Keywords**
WTO; SPS Measures; Bangladesh; Standards; Harmonization; Hazard

**Paper ID: 28**

# Curriculum and competence based education and training in Bangladesh

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## Abstract

The purpose of the study is to identify the situation of Curriculum and competence based education and training in Bangladesh. Planning by the organization includes creating, publicizing, and maintaining the program through training and education is the main factor for employee progress. Descriptive survey was used for the study. The simple random and purposive sampling technique was used. Data was collected from the from more than 50 TVET institutions in Bangladesh through questionnaire which was based on a five point Likert scale. They were analyzed by using chi square test at 0.05 significant levels. The study revealed that poor administrative support, lack of CBT trained up teachers, Designing Competency Based Curriculum, Industry-institution linkage, Laboratory facilities, Teachers attitude, Lack of competent and fully impartial assessors, Bureaucratic pressure, Deficiency of budget, and Public Awareness and being used to with traditional curriculum emerged as barriers of implementing the proposed competency based training programme (CBT) in Bangladesh. Modern digital lab and workshop should be built up for sound teaching learning situation to introduce Competency Based Training and Assessment (CBT&A) in training Institute like Bangladesh Institute of Management.. Modern and updated tools and equipment should be collected directly from abroad as like as Technical training center. The officials should be selected from the field level educational institute as an inexperienced official will not able to understand the educational strategy. Existing teachers should update their knowledge skill and attitude through training especially in developed countries on CBT&A system. Public awareness should be increased particularly why CBT&A is important for enhancing employment opportunities.

**Keywords**
Academic Management, Training Management

**Paper ID: 29**

# Occupational Safety & Health for Hospital Workers in Dhaka

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## Abstract

Occupational safety and health is an important component of decent work agenda. It means the condition of workplace where workers work is free from all kinds of hazards and risks. Hospitals have many unique hazards that can potentially affect the health of employees. Exposures to occupational hazards throughout hospital departments are highly variable. Chemical exposures can occur from disinfectants, cleaning compounds, hazardous drugs, mercury, and anesthetic gases. Biological hazards include viruses and bacteria, which cause hepatitis B and C, HIV, and tuberculosis, as well as latex allergy. Physical hazards include ionizing and non-ionizing radiation and ergonomic injuries from patient lifting and handling, lifting heavy equipment, and static postures. Controlling and minimizing workplace hazards for healthcare personnel (HCP) in hospitals present a unique challenge because the health and wellbeing of hospital patients must also be considered. Safe work is one of the fundamental rights of the workers. Risk comes in many forms - repetitive tasks, long hours of work, exposure to harmful substances like gas and fumes, noise, insufficient lighting, damage to equipment, and psychological and physical oppression. Risk can be eliminated or reduced by a variety of exposure control methods, including design elimination, substitution, engineering controls, administrative controls, and personal protective equipment, in order of preference.

**Keywords**

Occupational safety and health, Operations Management

**Paper ID: 30**

# Occupational Stress and work-life imbalance of Working Women-Bangladesh Perspective

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## Abstract

Work and family are the two most important aspects in women's lives. Balancing work and family roles has become a key personal and family issue for many societies. This paper aims to find out the reasons, which create work-life imbalance and stressful for a woman. Since in perspective of Bangladesh, a female employee faces more difficulties to balance between work and life than a male employee, this study focuses on women working in different sectors. This study has been conducted based on primary research where a sample of 50 female employees from different organizations is selected. Questionnaire and interviews were taken to reveal the reasons that lead to the reason on an imbalance work-life. The study shows that the reasons for which female employees are facing trouble to maintain a work-life balance are mostly because of: long working hours, job rigidity, job insecurity, work overload, responsibilities related to child care, discrimination & biasness at work place, lack of supervisory support, dominant managerial style and scarce family support. The finding of the study focuses on formulating a structured guideline for the organizations so that the above mentioned reasons can be omitted and female employees can balance their professional and personal life and live in harmony.

**Keywords**
Occupational safety and health, Operations Management

**Paper ID: 31**
# Quality and Safety Assurance in Ready Made Garments Industry

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## Abstract

RMG sector is the backbone of today's Bangladesh economy. Improvement is quality and assurance system can play a vital role in improving the productivity of the industries as well as economic development for the country.Improved quality and safety assurance system can add strength in global competitiveness in the global textile market through improving quality as low quality means high cost and loss of competitive position.This paper shows a case study on the quality and safety assurance system of a selected garment factory by applying different statistical tools. Various tests are used for data analysis purpose.Through regression analysis, it is found that the quality and safety assurance of the industries is in a better position.

**Keywords**
Quality Assurance, Occupational safety and health

**Paper ID: 32**

# Safety, Health and Welfare procedure of Garments sector in Bangladesh

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## Abstract

A strong health, safety and Welfare program of any industrial establishment can assure safety sound health and Welfare of its employees. The present study is aimed at identifying and comparing the present condition of the Safety, Health and Welfare in a garment company with the relevant laws. The nature of this study is exclusively a case study where only qualitative data were used. Personal observation and interview schedule were used to conduct the survey. 100% of the total population (i.e. 100) was selected randomly as the sample size which covers workers, concerned departmental executives, supervisors and managers of the garment company. It has been revealed from the present study that the sample organization does not follow all the provisions regarding health, hygiene and safety of workers as per the Bangladesh Labor Act 2006 amended in 2013.This study found out that the organization does not ensure the prescribed space for every worker in a work-room; there is no emergency exit and fire exit; all the dangerous machineries are not securely fenced; the company does not thoroughly examine every part of cranes and other lifting machinery regularly, which may cause accident; the company does not follow the schedule to examine every hoist and lift thoroughly by competent person; the latrines, washrooms, dust beans and spittoons are not clean at all times. Finally, some important recommendations are given to improve the health, safety and welfare of the sample organization on the basis of findings. Also, it has been suggested that the garment organizations, concerned stake holders and regulatory body (including government of Bangladesh) should be sincere to improve the overall Safety, Health and Welfare of the garment industry in Bangladesh.

**Keywords**
Occupational safety and health, Operations Management

**Paper ID: 33**
**Health safety and hygiene in RMG in Bangladesh**

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**Abstract**

Health safety and hygiene in RMG in Bangladesh is an important issue as garment sector is the main foreign currency earner and source of employment. In this paper, Health safety and hygiene in RMG in Bangladesh is studied.

**Keywords**
Occupational safety and health, Operations Management

**Paper ID: 34**
**Maternity Benefits and Welfare.**

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**Abstract**

The paper examines Australia's new minimum guarantee of paid parental leave. It does so both in the historical context of the evolution of parental payments including those bargained as employment right and by reflecting on the curious structure of the guarantee. A payment ordinarily made through the employer and contingent on a minimum level it attachment to the workforce. Yet funded by government and otherwise structured like a base-level social Security entitlement.

**Keywords**
Occupational safety and health, Operations Management

**Paper ID: 35**

# National Child Labour Law 2006 in Bangladesh Perspective

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## Abstract

Bangladesh is highly populated country in the world, density with 1,115.62 people per square kilometer. It is 147,570 square kilometers in total area with a population of more than 163.05 million**.** The population of Bangladesh, approximately 27.76% is under 14 year[2] and 17% of population is under 5 years of age. The population growth rate is only 1.03% and literacy rate on the other hand approx. 70 percent. Bangladesh is land of village. Around 84.8% of the population is living in rural areas in Bangladesh, a mainly rural country. It is a land of agriculture, and more than half of the rural population has land. In contrast more than half of rural population does not have land. They are land less people. 75% of children under the age of 12 are suffering ideal and balance food. Among them, about 85% of the population lives below the poverty line. According to the Urban Research Center, 60% of the population of Dhaka city is living below the poverty line. Most of us consider child labour exploitative and therefore, socially unacceptable. The study of child labour is, however, important not only for social reasons but also for economic ones. The impact of child labour on the economy works through its debilitating effect on education which is important component of human capital. The participation of children in work in home and outside is often considered to be one of the important reasons for low school enrolment in Bangladesh. An important effect of child labour is on demographic development in a country. It is generally found that poor countries with high rates of population growth have higher incidence of child work. In this study, the actual child labourers in Bangladesh are 4.14 million (*UNICEF*. June 2010. Retrieved 24 December 2015) which age is 5-14 years. The children are bound to do hazardous toils because of poverty. More than 1.3 million children work in hazardous situation. The Bangladeshi children deprived every winding of social and international aspects such as in trafficking, industrial works, household labours, early marriage, biri factory, forcedly prostitution, begging, less wages, helping in the vehicle etc. though the government of Bangladesh has taken many initiatives to prevent child labour and violation of child rights. But the achievement is not satisfactory, in this connection much phenomena are concerned; poverty is one of them. So, government, NGOs and public should take proper step to impoverish the vulnerable people, awareness buildings, enforcement of laws. The number of child labourers and victims of various disparities is quite alarming for our future generation.

**Key words**
Child labour, Bangladesh, National Law, International law. Poverty, Education, Hazardous work, Developing Countries

**Paper ID: 36**

## Effectiveness of labor law in Meghna Group of industries: Forces on section 78 to 99

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**Abstract**

There is a well written labor law in Bangladesh. However, its practical enforcement is assumed to be relaxed. This paper goes through the effectiveness of labor law in a large group of companies, namely Meghna Group of Industries, with regard to section 78 to 99

**Keywords**
Legal Management, Industrial Management

**Paper ID: 37**

## Implementation of Labor Law In Terms of Health & Safety Issues in RMG Sector of Dhaka Division

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**Abstract**

The main objective of this study is to understand and find out the implementation of health & safety provisions as per Bangladesh labor law act 2006 of RMG sector in Dhaka Division. Since RMG sector plays a vital role in the economy of Bangladesh, this study will be helpful to make policy decisions.
Keywords
Legal Management, Industrial Management

**Paper ID: 38**

# Emerging Challenge and problems work place in Bangladesh

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## Abstract

The purpose of this paper is to discuss emerging Challenge and problem work place in Bangladesh. We all know we'll be facing a lot of challenge here in the Bangladesh. as we get deeper into 2019, but what will the challenges be for employers operating on the global stage? People spend nearly one third of their adult lives at work, and workplace challenge and problem are a common source of stress for many. It is impossible to have a workplace challenge and every one's roles, expectations and personalities work perfectly together, without conflict. As such certain workplace issues may cause negative psychological symptoms. Research shows perceived stress in the workplace, for example is associated with a higher prevalence of mental health issues such as depression and anxiety. Workers may find discussing their workplace stress of challenges with a trained mental health professional is helpful to them both professionally and personally. Common workplace issues that employees face include interpersonal conflict communication problems, Gossip, Bullying, Harassment, Discrimination, Low motivation and job satisfaction, Performance issues, Poor job fit etc. The workplace is typically an environment in which people with different personalities, communication styles, and worldviews interact. These differences are one potential source of workplace issues and can ultimately lead to stress and tension for those involved. Although all employees have the right to be treated fairly and to feel safe in the workplace, some employees face bullying harassment, and or discrimination.

**Keywords**
Occupational Safety and Health, Industrial Management

**Paper ID: 39**
# Clean Power Generation in Bangladesh

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## Abstract

Bangladesh is a densely populated country of over 165 million people which is now recently becomes a medium income country generating over 10,000 MW electricity daily. It has a vision 2021 & vision 2041 and it will soon become an upper middle income country. A country's economic activity mostly depends on electricity. But this development in Bangladesh is mainly blocked by inadequate power generation. That's why Govt. gives priority to power sector. Additional important thing is not only to generate power but also in a cleaner way i.e environmental factors are also needed to be considered. This paper presents the hindrance and challenges to take renewable energy project in a densely populated country like Bangladesh where it is very challenging to get a piece of free barren land (for solar), to harness wind energy (wind speed is not sufficient) and finally the hydro power (head is not enough). It also highlights present scenario of power generation in Bangladesh along with fuel availability, major day to day challenges in maintenance of efficient natural gas based CCPP & GE, HFO based power plant, project funding, and project cost comparison among different fuel based plant and lastly viability of clean energy project in Bangladesh.

**Keywords**
Combined Cycle Power Plant, Gas Engine, Renewable Energy

**Paper ID: 40**

# Energy Recovery from Gas Distribution by incorporating Turbo Expander

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## Abstract

In Bangladesh Gas Distribution Company reduces gas line pressure to the regulated pressure by throttling and huge energy is lost here. If pressure reduction is done by using turbo expander instead of throttling then power generation is possible. This paper will discuss about reducing the power consumption of GBC using turbo expander. In addition to this power can be generated from every RMS using this turbo expander. There are lots of natural gas based CCPP in Bangladesh running successfully. So, a gas supply agreement (GSA) is done between Gas Distribution Company & the power station normally at 10 bar pressure. But the requirement of gas pressure at gas turbine inlet is 37 bar to 47 bar. But the fact is gas line pressure is above 30 bar and its variable. So, at first gas pressure is reduced from 30 bar to 10 bar using a throttle valve (few MW energy loss) and then again it is increased from 10 bar to 37 bar (as per requirement) using a gas booster. But if a turbo expander is used instead of throttle valve energy can be saved.

**Keywords**
Combined Cycle Power Plant, Gas Supply Agreement, Throttle valve, Turbo expander

**Paper ID: 41**

# Study of Existing Safety Signs in Three Selected Thermal Power Plants Situated in Sylhet Division, Bangladesh

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## Abstract

Useof safety signs is one of the waysfor controlling hazards in the work environment.Safety signs are used to increase human awareness, prevent unwanted situationsof the employees and visitors in workplace. Safety signs are used to effectively control workplace hazards. Correctusage of safety signs is vital, in order to prevent injury and save lives as well as properties. This study tried to findthe existing workplace safety signsin three selected thermal power plants namely Sylhet 150 MW Combined Cycle Power Plant,Fenchuganj 90 MW Combined Cycle Power Plant and Bibiyana South 400 MWCombined Cycle Power Plant. The research concluded that out of the 15 signs, “no smoking” and “high voltage” signs had the highest use at necessary places of posting safety signs. However,some of the standard safety signs were not used in the studied thermal power plants. Results show that overall safety sign usage withinthe studied thermal powerplantsweresatisfactory for Bibiyana South 400 MW Combined Cycle Power Plant. But the other two thermal power plants namely Sylhet 150 MW Power Plant and Fenchuganj 90 MW Power Plant require to implementsuggested safety signs at hazardousareas for a better safety culture.

**Keywords**
Safety Signs, Thermal power plant, Cognitive Ergonomics, OHSAS

**Paper ID: 42**

# Role and Development Procedure of Executive Personnel in Nestle Bangladesh Ltd

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## Abstract

Employee development is a joint, on-going effort on the part of an employee and the organization for which he or she works to upgrade the employee's knowledge, skills, and abilities. Successful employee development requires a balance between an individual's career needs and goals and the organization's need to get work done. Employee development programs make positive contributions to organizational performance. Most of the executive personnel think the most difficult thing about being a Manager or Executive are planning, execution, cost-control, not giving in to favoritism, avoiding discrimination, managing conflicts, balancing authority and friendliness, gathering a consensus etc. However, every time it becomes difficult to evaluate the outcome by using rating or scoring process from the trainings and also it is not possible to numerically express the improvement of knowledge, skill and behavior that are use deliver through trainings. The existing development process of Nestlé Bangladesh does to match point to point with these models but it is serving the purpose efficiently and cost effectively. However, in the coming days current training and development function will require modification according to the business need, as a result these assessments may help them for further improvement. Employee development is used to motivate staff to become truly dedicated to delivering high service quality in order to achieve customer satisfaction and retention. 82.4% executive personnel thought that there is a great role of HR department on employee development and maximum employee (76.5%) needs Career counseling for their development.To enhance managerial factors managers, need to provide coaching, mentoring, continuous feedback on performance and also provide opportunities for growth and networking.

**Keywords**
Employee Development, Executive Personnel, Training and Career Development.

**Paper ID: 43**

# Development of an Assessment Model for Ship Recycling Industry in Bangladesh

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## Abstract

Ship recycling habitually considered as the best means to dispose off a ship either at the end of her operational life or at any time as decided by the owner, regulatory bodies or law enforcement authority. South Asia is the global centre of ship breaking and recycling of End of Life (EOL) ships. Bangladesh has the prime share of recycling industry in the world. In Bangladesh, average 200 different types and of obsolete ships are recycled annually in different local recycling yards. In the present researcher it has been found that; average 2000000 LDT different types and sizes of obsolete ships are recycled annually in local yards in Bangladesh. Main problem of this sector is the restrictive nature, as well as lack of ground information. It's true that, very few studies have been completed so far; but mostly were based on limited preliminary information and assumption. That's why an extensive study is necessary to develop an assessment model for sustainable ship recycling industry of Bangladesh. It has been hoped that, local recycling industry of Bangladesh will be sustainable at future if proper guidance and professionalism can be enforced. This promising industry need continuous monitoring, balanced leadership, financing, guiding, motivation and whole hearted support from every corner from government and globe.

**Keywords**
Recycling, Waste Material, Model, Distribution Channel, Sustainable Model

**Paper ID: 44**
# Global warming and Impact to Third World Countries

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## Abstract

Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can result in many serious alterations to the environment, eventually impacting human health. It can also cause a rise in sea level, leading to the loss of coastal land, a change in precipitation patterns, increased risks of droughts and floods, and threats to biodiversity. Global warming will affect Poor Countries the Most. The World Bank Group says that global warming will lead to a major food-crisis in the future. Sub-Saharan Africa and Southeast Asia are expected to be the worst-hit. If our species wants to avoid widespread suffering and massive battles over resources due to millions or billions of climate refugees, we're going to have to come together to work on solutions that should not based on the capitalist logic of return on investment. We should spend our surplus resources to promote the development of the Third World and fight the threat of the ecological destruction of the planet? We are already too late. All egotism, hegemonies, negligence, inconsistency and deception should be ended without further delay. We should save our beloved planet.

**Keywords**
Global Warming, Carbon Emission, Climate Change

**Paper ID: 45**

# A Design Approach to Improve Existing CNG Filling Station by Improving the Layout

**Muhammad AbdusSamad, Abdullah Al Rahi, Pritidipo Paul Chowdhury, Eshayat Hasan Chowdhury Angon, and MD Mosharaf Hossain**

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## Abstract

Filling station has become one of the most heavily used facilities inthe modern age. The number of filling stations especially in Asia is on a continuous rise. As of November 2017, the number of filling stations in India is 60,799. But with unplanned layout planning, no specific line for different vehicles- the total productivity as well as waiting time drastically increases. Altogether the service time increases and most of the customers leave the stations being unsatisfied. This study attempts to design an alternative filling station from the perspective of a third world country. With the rising innovation in the solar power and growing popularity of electric vehicles, filling stations are not only limited to fuel pumps but also the plug-in charging station. To combine fuel stations and plug-in charging stations in a single station in a third world country has its challenges. This study steps towards to design the facility layout as well as a cheaper combined filling station which serves the purpose of refueling while serving the purpose of plug-in charging. The effectiveness of our approach will be tested with Arena software, AutoCAD are used in this study.

**Keywords**
Facility layout, Filling station, Electric Car, Service time, Alternate design, Customer Satisfaction

**Paper ID: 46**

## Globalization and its impact on workers and industrial social work practices: Bangladesh Perspective

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**Abstract**

The purpose of this paper is to provide insights into how globalization has impacted workers and industrial social work practices in Bangladesh. Data are collected from secondary sources which indicate us that globalization has increased the standard of living of workers. It has also improved the industrial social work practices due to the increased awareness among both employers and employees. In addition, the study notes that a lot of industrial social work programs exist to implement and improve the practice. Most of the workers do not know how globalization can improve their living standard and opportunity they can have. More and more industrial social work programs are needed to improve its practices in our industries to improve the social standard and skills and abilities to use resources to solve problems.

Keywords
Industrial Management, Human Resource Management

**Paper ID: 47**

## Motivating and Reinforcement safety and Health

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**Abstract**

This paper discusses on the topic motivating and reinforcement safety and healthy globally competitive. A case study on perfect printing limited was carried out. Address the question of how enterprises can improve their competitive through the acquisition and development of health and Safety program and hence how countries are able to raise the level of industrial development.

**Keywords**
Occupational Safety and Health, Industrial Management

**Paper ID: 49**
**Implementation of TQM in a RMG Factory- an Empirical Case Study.**

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**Abstract**

Total quality management (TQM) is the continual process of detecting and reducing or eliminating errors in manufacturing. It is one of the important tools to improve productivity, product quality, and reduce manufacturing costs by reducing rework and scrap. The main objective of this study is to identify the basic pillars required to implement TQM in practice and also improve the quality of the RMG industry by implementing a TQM approach. There was a high applicability to the TQM method in the RMG sector. As the RMG sector is the largest industrial sector of Bangladesh, Product Quality improvement can play a vital role in economic development for the country. We have used tools of TQM such as Flow chart, Check sheet, Histogram, Pareto Chart, Scatter Diagram, Control Chart, Cause and effect diagram from various garment industries of Bangladesh to analyze collected data. It is found that a significant amount of rework and scrape per style per month has minimized by applying this method. The improvement has enabled the reduction in rework and cost of poor quality through proper utilization of the company's internal resources without the need for significant investment.

**Keywords**
Quality Management, TQM

**Paper ID: 50**
**Health Related Quality of Work Life in RMG sector in Bangladesh**

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Abstract
This paper on the topic “Health Related Quality of Work Life in RMG sector in Bangladesh” addresses the question of how enterprises can improve their competitiveness through the acquisition and development of technology, and hence how countries are able to raise the level of industrial development. It shows how fast economic growth can be achieved through the "stages" approach to technology acquisition and development.

**Keywords**
Occupational Safety and Health, Industrial Management

**Paper ID: 51**

# Compliance with the WHO Surgical Safety Checklist

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## Abstract

Previous research suggests that the World Health Organization Surgical Safety Checklist time-out reduces communication failures and medical complications and supports development of better safety attitudes. Previous research also indicates that different values can affect the implementation of interventions. The objective of this study is to investigate the actual usage of the checklist in practice and to catalogue deviations for the purpose of identifying improvements.Four surgical procedures were recorded. The time-out was analysed quantitatively assessing compliance with a predefined observational protocol based on the checklist and qualitatively to describe reasons for non-compliance. It was found that the checklist is not always applied as intended. The components that facilitate communication are often neglected. The time-out does not appear to be conducted as a team effort. It is plausible that the personnel's conception of risk and the perceived importance of different checklist items are factors that influence checklist usage. To improve compliance and involve the whole team, the concept of risk and the perceived relevance of checklist items for all team members should be addressed.

**Keywords**
Occupational Safety and Health, Quality Management

**Paper ID: 52**

# Optimal Control Applied to the Treatment Strategy for Chronic Liver Disease

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## Abstract

Advanced liver cirrhosis has become life-threatening among the non-communicable diseases nowadays. Cirrhosis, the terminal stage of liver diseases in which the liver develops scarring as a result of various long-term continuous damages. In this paper, we develop a mathematical model to study the dynamics of chronic liver cirrhosis which can be controlled by vaccination as well as treatment. We formulate a five compartmental mathematical model of liver cirrhosis in terms of a set of nonlinear ordinary differential equations (ODEs) based on the characteristics of disease transmission by introducing two control measures. We formulate this model based on the optimal control theory using Pontryagin's Maximum Principle. For this, two types of controls such as vaccination and treatment according to underlying causes are employed to control the disease or to prevent people from being infected by liver cirrhosis. Finally, Numerical simulations are performed to illustrate the results. We observe that the optimal combination of two controls must be taken into consideration in order to reduce the liver cirrhosis transmission among the population.

**Keywords**
Mathematical Modeling, Health Management

**Paper ID: 53**
**Emerging Challenge and problems work place in Bangladesh**

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**Abstract**

This paper explores emerging challenges and problems work place in Bangladesh. The findings from this study will be helpful for policy making decisions.

**Keywords**
Industrial Management, Work Environment

**Paper ID: 54**
**5S in Total Productive Maintenance (TPM):A Case Study**

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Abstract
5S is a Japanese quality management tool that has been widely used worldwide. In this study, 5S with respective TPM is analysed in an organization. The findings would be helpful to devise effective implementation strategy for 5S.
Keywords
5S, TPM, Quality Management

**Paper ID: 55**
# Productivity Improvement at Coca-Cola

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## Abstract

This study was conducted to examine the impact of the poor- Quality management on Coca-Cola company's productivity. A case study of South Africa soft drinks production company (Coca-Cola). The study was carried out among the employees of the company's plant and through observing the wellbeing company's facilities located in Libro Business Park (LBP) around Johannesburg as well as their working equipment's. A sample of 150 workers was drawn from Coca-Cola south Africa. Each employee was asked questions, the questions were based on the experiment objective which is how productivity can be improved.Methods of measuring productivity were implemented to test the various hypothesis formulated in the study. The results showed that reducing quantity of inputs such as working time would enable the company to produce a standardized product. It was also found that proper maintenance of facilities and working equipment and employee's skill improvement would improve frequently run of operations within the company. Tied supervision, especial monitoring worker have a greater impact on performance and the company overall productivity. Thus, the company needs to encourage hygiene and improve employee's skills as the around us changes fast, new technologies and strategies must be adopted to obtain optimum productivity the workers.

**Keywords**
Quality Management, Productivity

**Paper ID: 56**

# Dissatisfaction in the Workplace and its Correlation to High Staff Turnover

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## Abstract

The primary aim of this study is to explore the extent to which the casual factors identified in the study contribute to high staff turnover within an organisation within Non-Governmental Organisation (non-profit organisation). The secondary objectives of this study are to: (i) understand how the working conditions and the management of non-profit organization impact on the level of satisfaction of the employees.Data was collected through semi-structured interviews and participant observations. A non-probability sampling technique was used for the study through convenience sampling. Within the organisation a sample of fifty people were identified, across several departments: The Finance Department, Bursary Management Programme Department, Marketing, Communication Department, Development and Human Resource Department.Eighty per cent of participants reported limited equipment and machinery available for them to perform their daily tasks, with company non-profit organizationusing one printer to perform the various functions of scanning, emailing, printing and copying of documents. This was supported by the observation made by the researcher. Ninety per cent of participants were concerned that management does not provide sufficient resources and rewards within the organisation.

**Keywords**
Working Conditions,Management,Non-Profit Organisation

Paper ID: 59

# Optimal Planning and Management of Groundwater Level Declination: A Mathematical Model

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## Abstract

Groundwater is an essential natural resource of our mother earth that constitutes about 95 per cent of the freshwater on our planet, making it fundamental to human life and economic development. Groundwater level change for many reasons. Some changes are due to natural phenomena, and others are caused by man's activities. It has been declining in Bangladesh since the introduction of deep tube wells (DTWs) and shallow tube wells (STWs) in late 1970s.We formulate a mathematical model to optimize the groundwater level declination with the help of a system of nonlinear ordinary differential equations (ODEs). The model is analyzed by using the stability theory of non-linear differential equations and numerical simulations. We consider two controls, building storage system and diverting river stream instead of frequent pumping of water for the optimal planning and management of groundwater level. We want to find the control strategies so that the overall cost of the storage system and diverting river stream is minimized while maximizing the groundwater level. Finally numerical simulations will be performed to show the effectiveness of the management of groundwater level.

**Keywords**
Groundwater, Optimal Planning and Management, Storage system, Equilibrium point, Optimal control, Numerical simulations

**Paper ID: 60**

# Modeling The Dynamics of Spreading Rumors and Fake News Through Online and Social Media

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## Abstract

A sensitive manipulated news which is well-known as rumors may derive a person, group or nation into a wrong direction. Sometimes it can even make a massacre among the mass people. By the progress of digital online and social media, any news can easily be manipulated and spreads dynamically. Sometimes it gets tougher for people to identify whether a news or information on online media is manipulated or not. Nowadays the act of forgery done by internet is increasing and some subtle people are using these online media for spreading rumors and fake or manipulated information regarding sensitive issues for serving their own purposes. Once any rumor is created and available on online media, it become spreading very quickly by sharing and discussing about that rumor by other anonymous people intentionally or accidently without verifying the fact in details. Some people want to verify and if find something wrong about that news, some people want to take actions against the propaganda and the people or group liable for it too. We've modeled the dynamics of spreading rumor on online media by using a system of four ODEs. This problem is studied as the dynamics of diffusing of misinformation over the online media using these ODEs as four compartments of the model. We have used them to describe the change of population liable for spreading rumor, who are preventing it from spreading, population acts neutral and may participate in spreading rumors without verifying. For validating and evaluating the system we did necessary qualitative and quantitative analysis like equilibrium and stability of the model. Then the analytical findings have been validated with the numerical simulations. After performing all necessary calculations we've proposed strategies for preventing or minimizing the rumor diffusion on the online media.

**Keywords**
Mathematical Modeling, Media Management

**Paper ID: 61**
# A Study on Diesel Engine Combustion

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## Abstract

The application of diesel engine has been rising dramatically since its invention and the usages have speared in the field of transportation, agriculture, constructions and what not. Due to its colossal power, this engine has become prominent whenever thinking about heavy duty performances. Diesel engine ignites fuel into combustion chamber, where air is pressurized by the upward stroke of the piston. As it is an internal combustion engine, the operation follows the order that can be obtained by two strokes or four strokes cycle. However, in both cycles the fuel energy is converted into machinery energy to produce power. The present study indicates the factors which need to be prioritized for appropriate combustion and the fuel characteristics on which the engine's efficiency depends. Moreover, in order to carry appropriate combusting and the safe operation of engine some effective measures are identified by scrutinizing the diesel engine used for heavy duty performance.

**Keywords**
Diesel engine, Combustion, Fuel, Air-fuel Ratio, Efficiency

**Paper ID: 62**

# Pollutants from Inland Vessels of Bangladesh – a Threat to the Environment

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## Abstract

Bangladeshi rivers are polluting day by day which has a devastative effect on the environment and the aquatic life. In concern of river pollution, the inland shipping operation can be a major part as because of riverine country like Bangladesh where approximately 13 thousand of registered and unregistered vessels plying through our country waterways for the purposes of carrying goods or passengers. Hence, Rivers are losing their sustainability & water integrity which can lead terrible consequences to us and the marine life as well. However, our transportation system will be more ship based considering the cost and road-traffic. So, deeming the circumstances this is high time to scrutinize the ship-based pollution that we are having from our vessels. The main intention is to evoke the leaders to concentrate on this critical issue by modeling the infrastructure of the pollution that have been emitting from day to day operation of inland vessels. Moreover, some effective measures are discussed followed by impact analysis which may help the industry to perform smoothly keeping the environment less affected.

**Keywords**
Inland vessels, Pollutants, Bilge, Fuel Consumption, Carbon Dioxide (CO2) Emission.

**Paper ID: 63**

# Effects of NACA 0012 and NACA 2412 Airfoils as Rear Spoilers on Sports Car Aerodynamic Drag & Lift: a CFD Study

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## Abstract

The simulation of superficial aerodynamics is one of the most challenging and essential automotive CFD applications. In the present research, aerodynamic effects of NACA 2412 cambered & NACA 0012 non-cambered airfoils as rear spoilers on a sports car have been investigated using Computational Fluid Dynamics (CFD) approach. The sports cars have been modeled in the commercial software SOLIDWORKS 2017. Total nine simulations were run: one for the flow around a simplified high- speed sports car model without any spoiler and other eight were run to visualize the flow around the sports car model with the spoilers made of NACA 2412 and NACA 0012 airfoil having -6°, -3°, +3° and +6° angle of attack respectively. The analysis has been carried out in ANSYS 15.0 FLUENT using k-epsilon model and for the velocity condition of 40 m/s. Grid sensitivity analysis has been done and the CFD study has been validated by comparing the results with the popular vehicle aerodynamics experimental study of Ahmed. Among the studied spoilers, it has been found that the NACA 0012 with +6° angle of attack ensures drag reduction by 2.16% and significant lift reduction by 111.22%. The effects of rear spoiler have been visualized from the aerodynamics perspective. The details of the aerodynamic study have been presented in the paper.

**Keywords**
Aerodynamics, Spoiler, Sports Car, Drag, Lift

**Paper ID: 64**

# Scrutinizing the Effect of Three Process Parameters on the Two Mechanical Characteristics of Lead-Tin Alloy Casting by Using Taguchi Orthogonal Array

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## Abstract

The Casting work had been done to figure out the effect of three process parameters (grain fineness number, moisture content and clay content) on the mechanical properties (hardness and tensile strength) of the lead-tin alloy using the L9 orthogonal array. This paper had added a specific amount of coal and sawdust with the moulding sand. It was found that, hardness was in its lowest value (19.97HRC), while tensile strength had its maximum value (55.93MPa) for the grain fineness number of 33. For the clay content data, it was shown that hardness had shown increasing trend (22.11 HRC to 23.64 HRC) and then shown a decreasing trend (23.64 HRC to 21.44 HRC) while tensile strength had shown a decreasing trend (55.45 MPa to 53.03 MPa) and then increasing trend (53.03 MPa to 54.51 MPa). For moisture content, the graph had shown that hardness had shown an increasing trend (21.19 HRC to 25.67 HRC) and then shown a decreasing trend (25.67 HRC to 20.33 HRC) while tensile strength had shown a decreasing trend (59.85MPa, 52.30MPa, 50.84MPa).

**Keywords**
Grain fineness number, Sand Casting, Taguchi Orthogonal Array, Lead-tin alloy.

**Paper ID: 65**

# Acceleration Analysis of Transversely Vibrated Cracked shaft

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## Abstract

The output of the rotating shaft vigorously depends on the condition of a shaft. While deeming the perfection of a shaft, crack can be one of the major factors that need to emphasize on. Because of the mechanical design the shaft undergoes continuous stress while the engine is running. As the power of the engine escalated the stress on the shaft started increasing and perpetual running of engine in this condition causes failure resulting crack in the shaft. However, crack may propagate into 2 stages, at the beginning there is rising stress, change in the cross section or some other factors, for instance-fretting, porosity, inclusion etc generates the crack. Afterwards, if the machine left running with the first condition the discontinuity started increasing because of repeated stress imposed on the rotating shaft. Crack present in the shaft can obstruct the performances of the shaft enormously and at a certain stage it causes failure or loss of efficiency. Thus, it's important to identify the crack within the shaft at the beginning of its generation. In this paper the cracked behavior of a shaft is identified by vibrating the shaft transversely. Different types of cracked specimen are examined, and data are compared with the behavior of specimen without having crack.

**Keywords**
Shaft, Crack, Transverse vibration, Acceleration.

**Paper ID: 66**

# Static and Fatigue Behavior Analysis of New Design Leaf Spring of Different Material Combination

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**Abstract**.

In the recent age of automotive innovation and excellence, driving comfort along with strength and longevity of the components has been considered as two of the most important and integral aspect into ensuring quality of any kind of automotive vehicle. Within the thriving and ever-competitive four-wheeler industry, automotive giants are fixated on bringing in new state of the art technology into multiple significant parts of the vehicle i.e. the suspension system, dominantly on multi-leaf spring in order to stay ahead of their competitors. The objective of this comparative study is to figure out a combination of materials that can be regarded as an improvement from the traditional leaf spring system in terms of strength, stability and flexibility and can also be integrated into the manufacturing process. In our study, composite material has been used for the leaves and silicone rubber sheets have been introduced in between the leaves for the development of the proposed leaf spring system. Through this paper we have put forth the findings in our relative study among steel leaf, composite leaf, steel leaf with silicone rubber and composite leaf with silicone rubber leaf spring. In order to demonstrate the discoveries found of the proposed model, Ansys 15.0 workbench has been utilized to input the proper loading conditions and also to comprehend and validate their deflection, stress, strain, strain energy and fatigue behaviors. The results indicated towards a noteworthy increase in the deflection properties of the material by using rubber sheets in between the composite leaves and it is believed that it can contribute greatly towards an improved dynamic effect on the stability of vehicles and also can ensure superior fatigue life over a conventional steel leaf spring system.

**Keywords**
Automotive Engineering, Product Design

**Paper ID: 67**

# Using Total Productive Maintenance as an Assessment in Improving System Performance

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## Abstract

Many organisations strive to growand survive due to increasingcompetition. Managers are constantly developing strategies that help organisations to remain productive while sustaining organisational growth and goal achievement. Organisational goals can be achieved through performing proper maintenance on plant equipment. Total Productive Maintenance (TPM) is a maintenance program which involves concepts for maintaining plants and equipment effectiveness. This study aims to analyse the root cause of breakdowns within the production line, and further use TPMas a tool in preventing system breakdowns. Relevant data was collected using questionnaires, observations, interviews and company records. The study then adopted and implemented competitive strategy which is a TPM model. Overall Equipment Effectiveness (OEE) was used as a measure of performance. The results obtained show that in a case that TPM is properly implemented; the OEE can increase providing the organisation competitive advantage.

**Keywords**
TPM, OEE, Maintenance, System performance

**Paper ID: 68**

# A Comparative Analysis of Natural and Artificial Flavorings through Analytical Methods and Flavor Additive Regulations

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## Abstract

Food is a valuable commodity due to its necessity to satisfy human hunger and enable human growth. One does not frequently know what toeat and depend exclusively, on what they see and read about on a product's label, and may end up consuming unsafe flavorings and coloring. Flavors are characterized by a material's sensory analysis; natural flavors generally mean essential oils. Artificial flavors, on the other hand, are made of various compounds that react and form a specific concentrate flavor. For the purpose of this study, natural strawberry flavors from a selected company was compared with artificial flavors created in a laboratory, using sensory,Refractive Index (RI) and Specific Gravity (SG), and consumers' perceptionanalyses. It was observed that both SG and RI are higher in artificial flavor compared to natural one, indicating artificial flavor to be more viscous. Furthermore, the result indicated that consumers preferred natural flavor over artificial flavor.

**Keywords**
Additives, Flavors, Artificial, Natural, Regulatory

**Paper ID: 69**

# Productivity Improvement at a Soft Drink Manufacturing Company: A Case Study

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## Abstract

This study was conducted to examine the impact of poor-quality management on the productivity of a beverage industry. A South African soft drinks production company was selected as a case study. The study was carried out among the employees of the company's plant and through observing equipment and wellbeing of company's facilities located in Johannesburg. A sample of 150 workers was drawn from the company, and each employee was asked questions onhow productivity can be improved. The results showed that reducing quantity of inputs, such as working time, would enable the company to produce a standardized product. It was also found that proper maintenance of facilities and working equipment and employee's skill improvement would improve operations within the company. Tight supervision and special monitoring of workers have a greater impact on performance and the overall productivity of the company. Thus, the company needs to encourage hygiene and improve employee's skills to adapt to fast changing technologies, and strategies must be adopted accordingly to obtain optimum productivity of the workers and satisfy customers by providing them with quality products. By responding to the needs of this contemporary marketing environment, it was believed that it will give the company competitive advantage over its competitors.

**Keywords**
Quality management, Productivity, New technologies, Beverage industry

**Paper ID: 70**
# Impact of Workplace Conditions on Level of Employee Satisfaction

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## Abstract

Late arrivalsand no show are major concern in South African workplace. The bad working environment and attitude of management may result in dissatisfied employees, which contributes toward most of the absenteeism. This study aims to investigatethe impact of the management and workplace conditions on the level of satisfaction of the employees.A Johannesburg based non-profitorganisation which has beenfacing high staff turnover was selected as a case study. About 50 employees across several departments were selected using convenience sampling for semi-structured interviews and participant observations. The result showed that majority of participants reported on limited equipment and machinery available to perform daily tasks, for instance the whole organization was using only one printer to scan, print and copy documents. Furthermore, majorityof participants were concerned that management does not provide sufficient resources and rewards to deserving employees.

**Keywords**
Workplace conditions,Management,Non-profit Organization, Employee satisfaction

**Paper ID: 71**

# Implementation of Labor Law in Terms of Health & Safety Issues in RMG Sector of Dhaka Division

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## Abstract

This paper assesses the level of proper implementation of labor law in terms of Health & Safety issues in RMG sector in Dhaka Division. This analysis will be helpful for taking policy decisions.

**Keywords**
Legal Management, Human Resources Management

**Paper ID: 74**
# Particle Transport through Periodic Tube with Hexagonal Cross-Section

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## Abstract

The consequences related to the theoretical investigation of transportation of particle through hexagonal periodic tube due to impact of both convection and diffusion is presented throughout this work. The influence of convection is primarily focused on this study. A fixed quantity of particles is initially enclosed to the central wave-section and its evolution is observed. Boundary element method has been formulated in order to calculate velocity and tangential force whereas convection-diffusion equation is solved by using explicit finite difference method. We assume several oscillatory pressure profiles based on the actual model of both convection and diffusion transport and find total mass and center of mass of particle depends on convection strength, recirculation flow and oscillatory pressure profiles. Although we have not found any net particle transport through axisymmetric and longitudinally symmetric periodic tube in the case of diffusion only, net particle transport has been observed through such periodic tube in the case of convection-diffusion which indicates that convection is the main reason for net particle transport. Also, we have found the dependency of pressure profile on particle transport. In addition, tube with recirculation zone has an impact on net particle transport. Since our investigation is fundamentally physical, our outcomes could be helpful for understanding the physical system in large scale.

**Keywords**
Particle transport, Periodic tube, Hexagonal cross-section, Convection-diffusion, Boundary element method, Finite difference method

**Paper ID: 75**

# Optimizing the Hotel Management System with Marketing Segments

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## Abstract

Hotel means a townhouse or any other building where visitors frequently visits to stay. Managing a hotel comes with a range of responsibilities. The authority of the hotel has to be able to adapt new challenges, help different departments and ensure the hotel maintains a standard of excellence. In this case operation research (OR) can be used to find the solution of these problems. The total revenue of a hotel mainly deepens on the marketing system. In this research, we divide the market into three segments (i) Demand Prediction (ii) Allocation System and (iii) Price Selection. For each segments, optimize mathematical models are developed and the validity of each models are checked by satisfying fundamental theorems. These optimize models have given maximum revenue with optimize demand, allocation and price. After that a mixed integer linear programming (MILP) problem is constructed for finding out the total revenue of a hotel. The MILP problem is equivalence to Linear programming (LP). It also satisfied the closeness and upper bound conditions. The MILP problem is solved by using the optimized results of demand, allocation and price models. The solution of the problem has given better revenue than past, which will help to rise up our Gross Domestic Production (GDP) rate and total economy.

**Keywords**
Hotel Management, Marketing Segments, Operation Research, Linear Programming, Mixed Integer Linear Programming, Optimization

**Paper ID: 76**

# Problems and Prospect of Textile Industry in Bangladesh

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## Abstract

The Ready-Made Garments (RMG) industry occupies a unique position in the Bangladesh economy. It is the largest exporting industry in Bangladesh, which experienced phenomenal growth during the last 25 years. By taking advantage of an insulated market under the provision of Multi Fiber Agreement (MFA) of GATT, it attained a high profile in terms of foreign exchange earnings, exports, industrialization and contribution to GDP within a short span of time. The industry plays a key role in employment generation and in the provision of income to the poor. To remain competitive in the post-MFA phase, Bangladesh needs to remove all the structural impediments in the transportation facilities, telecommunication network, and power supply, management of seaport, utility services and in the law and order situation. The government and the RMG sector would have to jointly work together to maintain competitiveness in the global RMG market. Given the remarkable entrepreneurial initiatives and the dedication of its workforce, Bangladesh can look forward to advancing its share of the global RMG market.

**Keywords**

Textile Industry, Engineering Economy

**Paper ID: 77**

# Mathematical Modeling Applied to Study the Effects of Wastage Produced from the Coal-Based Power Plant on Marine Ecosystem

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## Abstract

Mathematical Modeling in terms of a system of ordinary differential equations has been used to study the effects of wastage produced from a coal-based power plant on the marine ecosystem. It is considered that a coal-based power plant is one of the main sources of the emission of carbon dioxide, which is the principal reasonable agent for water pollution and thus poses a great threat to the marine ecosystem near those power stations. Since a huge amount of harmful gasses and chemical wastages emitted from any coal-based power plant which is the most dangerous threat to the marine resources and ecosystem. A 1000 MW coal-based power plant uses 9000 tons of coal per day, which produces a large amount of wastage and these wastages are mixed up with water and water is getting more polluted day by day. Actually, a coal-based power plant produces a huge amount of Lead (Pb), Mercury(Hg), Cadmium(Cd), Particulate Matter, Organic Compounds, etc. and it is mixed up with water in many ways and thus hampered the marine ecosystem. For studying the effects of wastage produced from the coal-based power plant on the marine ecosystem we've proposed a non-linear mathematical model using a system of three nonlinear differential equations. The model has been analyzed in order to describe the dynamics of emission and concentration of wastage from the coal-based power plant. The analysis carried out with the equilibrium and stability of the model. The boundedness of the solution of the model is discussed. The model has been analyzed by finding the existence of equilibrium points and also the conditions of stability and instability of the system have been derived. Finally, the reliability of the analytical model was confirmed with the numerical simulations.

**Keywords:**
Mathematical modeling, Wastage, Coal based power plant, Marine ecosystem, Prey, Predator.

**Paper ID: 78**

# Mathematical Modeling Applied To Assess The Environmental Effect Of Smog Concentration in Dhaka City

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## Abstract

Smog is the combination of fog or haze intensified by smoke or other atmospheric pollutants and it's considered as one of the main threads to human and animal health in long and short term. Various diseases are caused by this increased amount of smog. Since Dhaka city is one of the most densely populated city in the world , human and animal health diseases are caused by increased amount of smog increasing at a concerning rate . In this study we've formulated a non-linear three compartmental prey-predator model for describing dynamics of smog emission and concentration in Dhaka city by considering all the reasonable causes and constraints. Three compartments of this prey-predator model are Plants density, Human density & smog concentration. For validating and evaluating the system we did necessary qualitative and quantitative analysis like equilibria and stability of the model. The boundedness of the model is discussed. The model has been analyzed by finding the existence of equilibrium points & also the conditions of local stability, instability & global stability of the system has been derived. Finally the reliability of the analytical model has been confirmed with the numerical simulations.

**Keywords:**
Smog, Intensify, Compartment, Dynamic, Emission, Concentration, Constraint, Stability, Reliability Simulation

**Paper ID: 79**

# Study on the Use of Agent Based Modeling to Simulate Consumer Behavior

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## Abstract

In a competitive market, where numerous alternatives are possible, a key challenge for marketers is the understanding of consumer behavior. Understanding consumer behavior is complex because consumers have individual attitude towards purchase, consumption and disposal of product. An organization which fails to analyze how a consumer will respond to a product, will fall behind in the competitive market. Prior works have explained how consumer behavior can change with different internal and external factors such as quality of the product and store environment. But increasing online shopping system demands for the qualitative analysis of consumer behavior. In this paper, the analysis of the complex consumer behavior is done with Agent Based Modeling (ABM) and AnyLogic simulation software. The task is to create a virtual environment which will illustrate the transition of consumer states with respect to the change of different factors. This study focuses on the effect of waiting time and delivery time for only one product on consumer behavior. Consumers are represented as agents in the simulation environment and some parameters are set to control the environment. For convenience, consumers are segmented in four states to visualize the transition of consumers in the simulation environment. By changing the value of different factors for different consumer state, real-time data is generated from the simulation. From the obtained data, a set of random data is taken for data analysis of this study. One-way ANOVA and ratio of waiting time and delivery time approach are conducted to examine the impact of waiting time and delivery time on consumer behavior where P value was less than 0.05. Furthermore, this research identifies the effect of waiting time and delivery time on consumer behavior from the model, which will help the marketers to take the decisions of whether to launch a new product or not.

**Keywords**
Simulation, Consumer Behavior, Operations Research

**Paper ID: 81**

# Fuzzy Logic Application for Aircraft Landing Performance Analysis

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## Abstract

Aircraft landing performance analysis is one of the complex and challenging tasks for commercial flight operation. Landing impact on the aircraft structure is one of the main factors in terms of the safety issue. This present study is mainly focusing on the development of the landing efficiency analysis tools with the help of a Fuzzy Inference System (FIS). Mamdani type Fuzzy inference system has proposed for this study. In this model, a fuzzy system is a supervisory expert system. The knowledge is taken through the use of If-Then rules with linguistic terms. Here, a trapezoidal membership function is applied because of its computational efficiency and reduced complexity. Based on aircraft landing performance FIS logic, maintenance personnel can predict preventive maintenance. Similarly, aircraft designer can improve the design safety factor in the future aircraft manufacturing process through FIS rules analysis.

**Keywords**
Fuzzy Inference System, Fuzzy Rules, If-Then Rules, Landing Efficiency

**Paper ID: 84**
# Endogenous Uncertainties of Agricultural Production Yield

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## Abstract

Bangladesh is an emerging Asian country. Most of the people are involved in agriculture, but the country still finds difficulties feeding its large population. A good managerial system is still lacking in the agricultural field. That is why agricultural developments do not find sustainable growth. Endogenous uncertainties are a big issue that is affecting the agricultural system of Bangladesh over the centuries. Lots of criteria and sub-criteria are the reason behind it. Often farmers find difficulties that which criteria affecting most. Finding and solving vital criteria can increase productivity significantly. Analytical Hierarchy Process (AHP) helps to find out the main criteria which need to be solved at first. Thus, a good system can bring discipline and productivity in an agro-economic country like Bangladesh.

**Keywords**
Endogenous Uncertainties; Analytical Hierarchy Process (AHP); Agriculture; Agricultural Management.

**Paper ID: 85**

# Development of PLC and SCADA based Central Alarm System for Glass Bottle Manufacturing Industry

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## Abstract

Alarms are one of the most important aspects of a glass bottle manufacturing industry. Whenever there is a fault in any equipment of industries, the alarm will be active. The operators are taking responsibility to mitigate the fault after watching the alarm. However, the position of alarm is a very crucial factor. Normally, every alarm is located with the equipment. This can be a problem when no one notices the alarm for a long time, which causes a huge production loss. This paper introduces a PLC and SCADA based central alarm system, where the alarm can be located in the middle of the Hot End and Cold End section, where every people can acknowledge the alarm. Moreover, a buzzer can be introduced. The exact location of the fault is seen by SCADA. By the use of VNC software, Hot End and Cold End sections can view the SCADA window and take necessary actions, whenever the fault occurs. Moreover, a fault control system is being introduced, where bottles are falling down after one bottle will getting stuck and no one acknowledges the problem, which causes a huge loss. In our system, we present a system, where conveyor stops and the alarm will glow after the problem occurred, which connects with central alarm. This improves the production rate.

**Keywords**
PLC, SCADA, Central Alarm, VNC Server, VNC Viewer.

**Paper ID: 86**

# Application of PLC and SCADA Based Real-Time Online Counter for Glass Bottle Manufacturing Industry in Bangladesh

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## Abstract

For industry applications, automation is playing a major role all over the world. Among all automation components, PLC is most reliable technology over the years. In glass bottle manufacturing industry, applications of PLC are mostly substantial. Online counter is not being used in many glass bottle manufacturing industries around the world includes Bangladesh. This paper introduces a real-time counter for glass bottle manufacturing industry, where PLC and SCADA is being used. PLC is used for speed variation with respect to demand in every shift by the use of Variable Frequency Drive (VFD), reset every manual counters in every eight hours, counting the data from sensors in different locations and reject bottles from different inspection machines of glass bottle manufacturing industry, whereas SCADA is used for graphical representation of bottle numbers, number of rejected bottles from machines, number of falling and broken bottles, efficiency of overall system, graphs of efficiency and losses and speed of conveyor can be varied from the SCADA. TIA Portal v14 is used for PLC and WinCC Explorer is used as SCADA in this work. The data's will be shown in one hour and eight hours respectively. With the help of VNC Server and VNC viewer, users can see the data's from anywhere in industry.

**Keywords**
PLC, SCADA, Real-Time Online Counter, WinCC Explorer, VNC Server, VNC Viewer, Glass bottle manufacturing industry, VFD, Optocoupler

**Paper ID: 87**

# Development of VFD, PLC and SCADA Based Fluid Temperature, Pressure and Level Control for Food Manufacturing Industry

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## Abstract

Food industries are mainly focused on the exact temperature and pressure of chemicals and water levels due to maintaining the quality and government rules. This paper deals with the concept of accurate fluid temperature and pressure system, which in-turns help to get the desired output for food industrial purpose. This paper aims to implement a controlling and monitoring system of fluid level, temperature, and pressure using VFD by PLC along with SCADA and PID. For the Food industry, to acquire variable fluid pressure and density, it needs to maintain the pump-motor liquid quantitatively, which is focused on our proposed system. Low/high-pressure level detection factors make VFDs superior to mechanical devices for regulating pump flow. VFD is employed to control the speed of pump-motor so that the required level and pressure can be achieved. Also, the temperature sensor is used to detect the temperature of the liquid. The implementation of a hardware and software for speed control, temperature control, pressure control, parameter monitoring on SCADA and WinCC RT Advanced screen is provided.

**Keywords**
Fluid Temperature, pressure, level, PLC, SCADA, VFD, WinCC RT advanced, pump-motor.

**Paper ID: 88**
# An Image Processing Based Glass bottle Defect Detection System

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## Abstract

Glass defects are one of the main causes of production losses for glass bottle manufacturing industry. Many machines like, Evolution 12, Evolution 5, OLT AGR, MettlerToredo, and ISM Ranger is used to detect the defects of glass bottles in different sides. Some machines are responsible to detect the cracks and others are responsible to detect the bubbles. This paper introduces an intelligent glass defect detection system, where only one machine can detect the bubble and crack defects of glass bottles. This system is entirely controlled by the use of image processing techniques. Image processing helps for detecting the glass defects by using Haar Cascade method. These processes held automatically by a camera and by the use of stepper motor, the glass bottle will rotate 360 degree and an entire bottle will check from the camera. After detecting the defect, the image will be captured and stored in the monitor. Finally, glass defect data s will be collected and prove the effectiveness of the proposed system. This system will support as an extremely effective glass bottle defect detection application.

**Keywords**
Image Processing, Glass bottle defects, Harr Cascade method, .net framework, Arduinouno, Stepper motor

**Paper ID: 89**

# Analysis and Optimization of Traffic Congestion at Single Intersection Using MATLAB and Arena

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## Abstract

Traffic jam is one of the biggest worldwide problems that causes loss of billions of dollars and useful hours every year. Traffic lights are used at the intersections to control the traffic. But one problem of these traffic lights is that they change at constant intervals regardless of the traffic density or time of the day. As a result, the process fails to maintain optimal traffic flow. This study describes a possible way to control traffic lights by considering the traffic density for a particular time of the day. The range of idle time or waiting time in the queue is identified as a function of cycle time, effective green time and traffic arrival rate and after plotting the values in the graph, we can observe the trends of idle time with respect to these variables. The lower bound and upper bound for these independent variables like cycle time, effective green time and traffic arrival rate is determined from observed data sets. As idle time comes in form of range, we get an estimation of traffic congestion of a particular time. This traffic flow is analyzed using Arena. The result of idle time using Arena is analogous with the previously analyzed model using MATLAB. Also, at the end of the study, a simulation video is generated that gives the practical visual experience.

**Keywords**
Simulation, Operations Research

**Paper ID: 90**

# Improvement of Transportation Efficiency Using Simulation-Based Decision Support System

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## Abstract

Transportation plays a vital role in exporting and importing various goods around the world and it is also considered as an important aspect of GDP growth and gaining economic scale in Bangladesh. Due to lack of developed infrastructure, transportation cost is much higher due to the unwanted waiting time and costs. This article has proposed a new framework for simulation-based decision support systems to improve the transportation efficiency with the help of M/M/S Queuing Simulation and Queuing cost model at Chittagong Sea Port to reduce per day total ships queuing under current arrival rate. The results and analysis of the proposed model show that there is further opportunity to accommodate more ships at the seaport due to the reduction of ship queuing cost at a utilization rate of 92.10%. Nonetheless, the reduction in ship queuing cost will eventually contribute simultaneously to the improvement of container handling services and will increase the economic activities due to the escalation in the number of container handling at Chittagong Sea Port.

**Keywords**
Transportation, Decision support system, Queuing, Simulation, Optimization

**Paper ID: 91**

# Risk Minimization of Warehousing System by showing Probable Total Costs towards any Certain Company with the help of Monte Carlo Simulation

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## Abstract

Warehousing System is a mandatory part of any existing distribution network which is specially designed to accommodate long-term storage of goods which may include raw materials, work in process materials, packing materials or finished goods associated with manufacturing. Since warehousing has a huge percentage of total supply chain cost, it costs not only a huge amount of money but also requires a large space, which highlights the importance of warehousing efficiency. However due to lack of proper approach towards the forecasting of warehousing system many companies face the loss of significant profits. This article highlights a new way for uplifting the performance of warehousing system by numerical example with the help of Monte Carlo Simulation through total probable cost calculation by controlling order quantity, reordering point, lead time to reduce the effects of holding costs and ordering costs for any certain companies. Eventually, it will contribute to the improvement of customer service level and will influence the performances of entire supply chain more effectively. Nonetheless, many companies will also be able to customize their warehouse according to their necessity to reduce the risk of over inventory.

**Keywords**
Warehousing System, Monte Carlo Simulation, Reordering Point, Lead Time, Decision Support System

**Paper ID: 92**

# Study of Automotive Battery Recycling and Development of a Sustainable Method

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Abstract

Lead-acid batteries are most widely used automobile batteries all over the world. Many waste batteries are thrown away every year. But the fact is that lead is only found in nature and therefore it has limited supply. Also, thrown away lead can cause lead pollution to animals and plants which can be fatal. So, the best option is to recycle the battery. In this research, existing factory process of lead-acid battery recycling are analyzed and a sustainable method is proposed.. This research is beneficial to least developed countries where there are not enough recycling factories and recycling cost is higher.

**Keywords**
Industrial Engineering, Environmental Pollution, Sustainable Design

**Paper ID: 93**

# Using Discrete Event Simulation to Improve the Patient Flow of a Healthcare System

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## Abstract

Long waiting time in any process is a challenge for any healthcare system. As healthcare institutions are complex and busy system and various department interacts with each other any existing bottleneck can drive the whole system into failure in providing in time services. And that arises the need of use simulation to detect and eliminate the bottleneck faced in any process. In this paper, a model based on simulation aiming at patient flow optimization in a health care system been proposed. To achieve the goal, first, modeling of patients' workflow was created by using discrete-event simulation using Rockwell Arena Software. Afterward, alternative scenarios were analysis in the process analyze to identify the best scenarios. Among defined scenarios Analytical Hierarchy Process method (AHP) scores the highest value to the most suitable one. The results of the simulation indicate that performing this scenario can decrease non served patient number almost zero by adding some resources while elimination few others. To get the maximum utilization form the resources at the end resource scheduling is presented.

**Keywords**
Simulation, Operations Research

**Paper ID: 95**

# A Crowdsourced Approach for Supply Chain Network Optimization Using Hub and Spoke Model

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## Abstract

Crowd sourced delivery is considered a possible solution to the last-mile on-demand delivery challenge. This paper aims to identify and analyze an optimized & efficient supply chain network solved with hub and spoke model using a crowd sourced approach. For this approach, a well-known retail company of Bangladesh is considered that automatically creates matches between parcel delivery tasks and ad hoc drivers. This platform is a chain of Bangladeshi department stores specializing in Bengali ethnic wear and handicrafts. The secondary data is collected from the company. The performance of the crowd sourced last-mile delivery is investigated with regard to service level and assets utilization. The main focus of the resulting model is to minimize the total transportation cost and how crowd sourcing will affect the whole chain. Hub and spoke distribution paradigm is a form of transport topology optimization in which traffic planners organize routes as a series of "spokes" that connect outlying points to a central "hub". The supply chain network includes a number of manufacturers, suppliers, distributer locations and demand points which need to be located not just randomly but as a result of careful calculation to minimize the overall cost and increase the supply chain surplus. The presented model and analysis are the results of an experiment of the supply chain network of the platform toward engaging in social network-reliant package delivery. The hub and spoke model is an excellent approach to make the whole system more robust and agile by receiving products from many different origins, consolidating the products, and sending them directly to destinations. Crowdsourcing is the process of obtaining ideas, services or information by soliciting feedback from a large group of people. Here in this paper, the effects of crowd sourcing on the supply chain is emphasized by using a linear programming model in MATLAB. The result will be evaluated and analyzed for further improvement and practical use.

**Keywords**
Crowd sourced, Last-Mile Delivery, Transportation Cost, Supply Chain Network, Hub And Spoke Model

**Paper ID: 96**
# Design and Fabrication of Foldable Bicycle

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## Abstract

A foldable bicycle is a bicycle designed to fold into a compact form, facilitating transport and storage. When folded, the bikes can be more easily carried into buildings, on public transportation and more easily stored in compact living quarters or aboard a car, boat or plane. Folding mechanisms vary, with each offering a distinct combination of folding ease, compactness, ride, weight, durability, and price. Distinguished by the complexities of their folding mechanism, more demanding structural requirements, greater number of parts, and more specialized market appeal. The choice of model, apart from cost considerations, is a matter of resolving the various practical requirements: a quick easy fold, a compact folded size, or a faster but less compact model.

**Keywords**
Product Design, Foldable, Transportation, Storage, Durability, Compactness

**Paper ID: 97**

# Effect of Fiber Loading on Thermo-Mechanical Properties of Onion Roots and Broom Grass Fiber Reinforced Hybrid Polypropylene Composites

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## Abstract

Polymer matrix composites are multi-phase materials, which consist of polymer as the matrix with fibers as the reinforcement resulting in synergistic properties. When they are combined they create a material which is specialized to do a certain job, for instance to become stronger, lighter or resistant to electricity. The reason for their use is because they improve the properties of their base materials and are applicable in many situations. Hybrid composites are those composites, which contain a combination of two or more reinforcement fibers. In present research, hybrid polymer matrix composites were prepared with polypropylenes as the matrix and onion roots and broom grass as the fibers. Using hot-press technique three composites of different fiber content were prepared. Fiber loading were varied at 5, 10, 15 %wt. For mechanical characterization, tensile, impact, flexural and hardness tests were conducted. Thermo-gravimetric analysis was performed for thermal evaluation. From tensile test it was found that tensile strength and Young's modulus increased, while % elongation decreased with increase in fiber loading. From flexural, impact and hardness tests the flexural strength, flexural modulus, impact strength and hardness were found to be increased with increase in fiber content. Thermo-gravimetric analysis showed that 15 wt% fiber reinforced hybrid composite had higher thermal stability as compared to other two composites. Based on the fiber loading, composite containing 15 wt% hybrid fiber showed the best set of mechanical and thermal properties.

**Keywords**
Onion Roots and Broom Grass Fiber; Polypropylene Composite; Fiber Loading; Mechanical Properties; TGA

**Paper ID: 98**

# Characterization of Glazing Defects and Study for Prevention Measures Focusing Traditional Tableware Ceramic Industry in Bangladesh

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## Abstract

In more recent time, the pin-holing defects are one of the major challenges that the export oriented tableware ceramic industry in Bangladesh is experiencing. Raw material composition, difference in linear thermal expansion coefficient, degradation, and stress relations among the body, intermediate layer, and glaze are the main causes for these glaze relevant defects. In order to define relevant glaze and body characteristics a combination of test methods has been developed to specify the glaze and body in relation to its behavior regarding pin-hole growth. It is evident from this research work that the pin-holing defect can be removed by optimizing composition and sintering profile, which in turn yield pin-hole free tableware ceramics with smaller grain size. Density of the sintered tableware increased with the increase content of feldspar and decrease of quartz. Tableware ceramic body sintered at 1000ºC (60 min) and 1300ºC (90 min) exhibited appropriate microstructure and coefficient of thermal expansion which meet the requirements for the tableware ceramic. It is found that the pin-holing defect depends on the amount of feldspar and quartz as well as firing temperature profile, especially soaking time and firing cycle and the result was satisfactory when (Quartz/Feldspar) was 1.94.

**Keywords**
Tableware Defects, Glazing Defects, Pin-Holing Defects, Ceramics, Production Engineering

**Paper ID: 99**

# Causes of Low Back Pain among Workers of a Garment Industry in Bangladesh

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## Abstract

This present study is planned to explore the causes of some low back pain related factors (socio-demographic, personal, organizational & working) and to investigate how low back pain impacts (characteristics & impacts of low back pain) the worker's daily life. Low back pain is one of the common health problems among garment workers that slows down worker's ability and hence reduce production rate. Slovin's formula was used to determine the required sample size. Confidence level of this study was 92%. One hundred fifty-one subjects (73 male & 78 female) were recruited to be volunteers for this study. They were interviewed through questionnaire for obtaining informed consent. SPSS was used as the tool and test was "Chi-Square Test". Workers were classified according to working experience as 0-1 year working experienced workers, 1-2 years working experienced workers, 2-5 years working experienced workers, 5-10 years experienced workers, above 10 years experienced workers and from the analysis it is found that 10 years above experienced workers had the maximum low back pain which is 88.24%. Worker's age was categorized into four group as adolescence (12-18 years), early adulthood (18-35 years), midlife (35-50 years), mature adulthood (50-80 years) and from the analysis it was found that all of mature adulthood workers having low back pain problem. Four types of body mass index namely underweight, healthy, overweight & obese and analysis demonstrated that 71.42% of having low back pain problem workers was overweight. Some working postures were highly pertinent to the workers low back pain and those postures were twisting, standing, lifting, pushing, pulling, throwing and carrying. Sitting position was responsible for occurring low back pain mostly reduce 91 workers out of the suffering. There were 107 workers (70.86%) suffering from low back pain problems. Further the research showed that workers suffered from the three different types of low back pain namely acute (20.6%), sub-chronic (22.4%) and chronic (57.0%). The result showed that interviewed workers had chronic low back pain the most.

**Keywords**
Occupational Health & Safety, Low Back Pain, Industrial Workers, BMI

**Paper ID: 100**

# Stakeholder Management in Complex Projects- AComparative Case Study

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Stakeholder management is considered as one of the success factors of projects, but the number of studies on stakeholder management in a sophisticated project setting is narrow. This study will analyse two complex projects in different sectors to contribute to stakeholder management discussion. The projects include the Äänekoski bio product mill, Finland, and Sydney Metro West, Australia. The first project is analysed using public resources, and the second project is analysed by public resources and the project owner's interview. Both cases were investigated using tools such as Martinsuo and Lehtonen's complex project characteristics tool, guidelines from the GAPPS report, Mitchell et al.'s stakeholder salience theory and scoring method. This study combines the analysis of the projects and suggests tools to determine complex projects and prioritize stakeholders in complex project setting. The study attempts to benefit project management researchers interested in stakeholder management and complex projects.

**Keywords**
Stakeholder Management, Complex Project, Stakeholder Salience, Project Management.

**Paper ID: 101**
# True Technology Transfer: Crying Need at the Moment

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## Abstract

Technology transfer means transfer of technology and it'scommercialisation i.e. transfer of new technology from the originator/ creator to a secondary user, specially from developed to developing countries in a attempt to boost their economies. It is the process of transferring skills, knowledge, technologies, methods of manufacturing, samples of manufacturing and facilities among government or universities or other research institutions to ensure the scientific and technological development are accessible to a wider range of users who can further develop and exploit the technology into new products, processes, applications, materials or services. As technologies are continuously emerging and affecting our lives in ways that indicate we are at the beginning of a Fourth Industrial Revolution, a new era that builds and extends the impact of digitisation in new and unanticipated ways. Our national vision is to achieve the SDGs in a robust ways as like as we did in achieving MDGs with a view to transform our country to a category of prosperous country, on or before 2041.We must have our command on technology in different levels overcoming the existing technology recipient country.

**Keywords**
Technology Management, Technology Transfer

**Paper ID: 102**
**Preparing and Using the Case Method of Teaching**

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Abstract

The case study method in teaching is increasingly becoming popular with instructors teaching about management and management development. While many have adopted this approach, others would like to but feel that they need to know more about the method before doing so. This article aims to help them by explaining this technique.

Keywords
Academic Management

**Paper ID: 103**
**Effects of Climate Change on Occupational Health, Safety and Productivity**

**Dr. Kazi Reshad Agaz**

**Abstract**

This paper describes the effects of climate change on occupational health and safety together with its impact on productivity. It is a new dimension that demands attention of the policy makers and this paper would be helpful for that purpose.

**Keywords**
Environmental Management, Productivity

**Paper ID: 104**

# Organizational Conflict – an HR Challenge in the 21st Century: Bangladesh Perspective

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## Abstract

Conflict is an integral part of human life; whether it is the personal life, organizational life, social life or national life. In most of the cases, conflict creates a great harm to achieve the mission of an individual as well as to the organization. So, managing conflict is essential. This study explores the impact of the organizational conflict in Bangladesh perspective. This study assessed and identified the major types, cause of conflict in Bangladeshi organizations and also found some better ways to minimize or resolve these conflicts to retain the healthy environment in the organization. The data were collected through structured questionnaire from 80 sampling unit (both male and female respondents from different levels of positions in the organizational hierarchy participated). This study concludes that the main conflict in organizations is employee-management conflict and the reason behind this is lack of recognition of employee contribution as well as lack of appropriate knowledge by the top management in the organization. Male staff fully agreed to the above conclusion. But in some cases, female agreed partially as they get some favor over their male colleagues from top management as being female; it also create employee-employee conflict in some extent. The findings and recommendations show that the appropriate recognition and better communication among the employees can minimize the conflict in the workplace.

**Keywords**
Conflict Management, Human Resource Management

**Paper ID: 105**

# Water Acting as a Dredger to Protect River Side Industry due to Construction of BambooBandals

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## Abstract

River dredging is the intelligent arrangement for the river bank erosion protection. Most of the industries are situated near the river bank and those are facing river erosion. To avoid these river bank erosion, water can be used as dredger to combat river side industries situated near the river. To address such a national problems, a laboratory study is conducted at River Research Institute, Faridpur, Bangladesh. In the laboratory river channel banks, a series of bamboo bandals are placed to dredge the river to combat erosion. For this low cost approach, it is needed to know in details in the laboratory before going to the field. In laboratory, it is observed that water flow diverted towards the main river due to bandals placing near the river bank resulting comparatively high velocity appeared away from the erosion prone area of the industry where water acts as dredger deepening the channel. This has given an indication that water is act as a dredger to combat erosion near the river bank industries.

**Keywords**
Environmental Management, Erosion Protection Engineering

**Paper ID: 106**
# Labour Unrest in Garment Sector; Policy Options for Bangladesh

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## Abstract

Bangladesh experienced a precarious economic situation during the first half of the 1970s. Instead of steady growth of industrial sector its economy was highly dependent on foreign aid almost throughout this decade. Strangely enough, a new sector RMG silently grew-up with the initiative of few private entrepreneurial talents to rescue country's economy at that crucial time. The rise of RMG industry in Bangladesh can be attributed to increasing demand in developed countries for cheap apparel for good reasons. However, this RMG sector which has made a crucial contribution towards the transformation of Bangladesh economy from a predominantly aid-receiving nation to a trading nation and currently the highest export earning sector of Bangladesh (nearly 76%), needs due attention on damaging part of labour unrest. Workers have to survive and garment owners have to make profit-this is reality and a permanent solution has to be found out in order to stop such recurrence of labour unrest time and again. Failing to address this issue will cause more violence on the streets, unrest in the factories and possible destruction of private properties. In this research, the objectives are to find out the causes of labour unrest and to recommend policy guidelines for its prevention leading to an improved socio-economic stipulation for Bangladesh. A blend of four methods such as content analysis, survey method, case study and interview is used for the purpose of this research.

**Keywords**
Industrial Management, Human Resource Management