Dr. Shikha Singh

Assistant Professor, Dept. of Management Studies & Industrial Engineering
Indian Institute of Technology (ISM), Dhanbad

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Academic Experience

2023 – Till Date	**Assistant Professor (Level 13 A1)** Department of Management Studies & Industrial Engineering, Indian Institute of Technology (ISM), Dhanbad Jharkhand, India-826004
2019 – 2023	**Assistant Professor (Level 12)** Department of Management Studies & Industrial Engineering, Indian Institute of Technology (ISM), Dhanbad Jharkhand, India-826004

Industry Experience

2016 - 2019	**Manager, Management Services Department** Hindustan Aeronautics Limited, Kanpur, Uttar Pradesh, India
2015 - 2016 **2012 - 2014**	**Deputy Manager, Process Planning Department** Hindustan Aeronautics Limited, Kanpur, Uttar Pradesh, India
2011 - 2012	**Engineer, Integrated Material Management** Hindustan Aeronautics Limited, Nasik, Maharashtra, India
2010 - 2011	**Engineer, Process Shop** Hindustan Aeronautics Limited, Nasik, Maharashtra, India
2008 - 2009	**Management Trainee, HAL Management Academy** Hindustan Aeronautics Limited, Bangalore, Karnataka, India
2008	**Business Analyst** Cognizant Technology Solutions, Kolkata, West Bengal, India

Academic Education

07/2014 - 01/2019 **Doctor of Philosophy** **CGPA** 9/10

Department of Industrial and Management Engineering, Indian Institute of Technology, Kanpur, India

Thesis "*Investigation of Success Determinants for Institutionalization of Product Lifecycle Management (PLM)"*

Supervisor – Dr. S. C. Misra, Professor, Department of Industrial and Management Engineering (Now, Dept. of Management Sciences), Indian Institute of Technology, Kanpur, India

07/2004 - 06/2008 **Bachelor of Technology** **CGPA 7.97**/10

Department of Metallurgical Engineering, Indian Institute of Technology, Banaras Hindu University, Varanasi, India

Professional Certificates

Dec 2024 **Authorized Training Partner for PMP training of Project Management Institute, USA**

March 2021 – Aug 2022 **Micromasters in Design Thinking**
Rochester Institute of Technology, New York, USA
Supervisor – Lorraine Justice, School of Design, Hong Kong Polytechnic University

Aug 2021 **Qualified Project Management Professional (PMP)**
Certification exam by PMI, USA (project managers with at least 3 years of industry experience qualify to write the PMP exam)

R&D Projects

Project Title *"Capacity Building of Faculty and Institutions towards Design and Entrepreneurship Development."*

Role Principal Investigator
Status Ongoing
Sponsor Ministry of Education

Project Title *"Future Ready Hospitals: Strategic Adoption of Industry 4.0 Technologies in Eastern and North-Eastern India."*

Role Co-PI
Status Ongoing
Sponsor ICSSR

Project Title *"Implementing PM Surya Ghar: Muft Bijli Yojna in Tribal Areas of Jharkhand – Investigating the Drivers and Barriers of Solar Rooftop Adoption."*

Role Co-PI
Status Ongoing
Sponsor ICSSR

Project Title *"Predictive Analytics: Potential use of Generative AI to optimize the Geothermal energy extraction process."*

Role Principal Investigator
Status Ongoing

Sponsor Capgemini Technology Services India Ltd.

Project Title *"Investigation of the Institutionalization Status of 'Digitalization' and Future Roadmap for its Improvement in Automobile Manufacturing Organizations."*

Role Principal Investigator
Status Completed
Sponsor R & D Grant, IIT (ISM), Dhanbad

Project Title *"Demand Sensing (Customer-centric demand sensing by capturing real-time customer traffic from Online & Offline Channels, social media etc.)"*

Role Principal Investigator
Status Completed
Sponsor Capgemini Technology Services India Ltd.

Project Title *"Electric Vehicle Battery Management (Battery Health Monitoring and Predictive Analytics & Maintenance and Integration with Charging Infrastructure)."*

Role Principal Investigator
Status Completed
Sponsor Capgemini Technology Services India Ltd.

Project Title *"Predictive Analytics to Improve the Availability of the Manufacturing Equipment in Automotive Firms."*

Role Principal Investigator
Status Completed
Sponsor Capgemini Technology Services India Ltd.

Project Title *"Develop and demonstrate MBSE framework on PLM and RFLP methodology for an avionics component having multi-disciplinary domains."*

Role Principal Investigator
Status Completed
Sponsor Capgemini Technology Services India Ltd.

Outreach / Executive Development Programs

- Global Initiative for Academic Networking (GIAN)
  Proposal No.: 2514008
  Title: Systems Engineering and Applications

- Refresher Training Program for Executives of Coal India Limited Executives
  Domain: Management, Operations, and other engineering domains
  Batch size: 300

- Project Management Certification Program (Affiliated to PMI, USA)
  Duration: 19th December – 30th December 2024
  Mode: Online
  Batch Size: 15

- Project Management Certification Program (Affiliated to PMI, USA)

EDP No.: CONS7292E
Duration: 5th – 20th September 2024
Mode: Hybrid
Batch Size: 20

- Project Management Certification Program (Affiliated to PMI, USA):
  EDP No.: EDP/7186/2023-24
  Duration: 11th – 20th March 2024
  Mode: Hybrid
  Batch Size: 50

Collaborations / MoU Signing

Industry Collaboration Activities

MoUs Establishment

Establishment of MoU between Department of Management Studies, IIT (ISM), Dhanbad and Hindustan Aeronautics Ltd., Accessories Complex, India

Nature of activity	Industry-Academia collaboration
Role in the activity	Initiated & signed on Aug 2021
Specific Contribution	Industry exposure to the real-life problems and its solutions through internships, projects, workshops and jobs.

Establishment of MoU between IIT (ISM), Dhanbad and Capgemini Technology Services India Ltd

Nature of activity	Industry-Academia collaboration
Role in the activity	Initiated & signed on July 2021
Specific Contribution	Industry exposure to the real-life problems and its solutions through internships, projects, workshops and jobs.

Establishment of MoU between IIT (ISM), Dhanbad and L&T, IPM

Nature of activity	Industry-Academia collaboration
Role in the activity	Initiated & signed on July 2024
Specific Contribution	Industry exposure to the real-life problems and its solutions through internships, projects, workshops and jobs.

Establishment of MoU between IIT (ISM), Dhanbad and SNNMCH Hospital Dhanbad

Nature of activity	Industry-Academia collaboration
Role in the activity	Initiated & signed on August 2024
Specific Contribution	The Jharkhand government's goal of providing accessible and effective healthcare delivery throughout the state is supported by IIT (ISM) to bridge the gap between technology and healthcare management.

International Academic Collaboration Activities

MoUs Establishment Establishment of MoU between Dept. of Management Studies & Industrial Engineerin, IIT (ISM), Dhanbad, and Industrial & Systems Engineering Dept., Oakland University, USA (Initiated & signed in Feb 2023).

Patents Published

1. Indian Patent Application No. 202331028699 dated 20.04.2023 in the name of Indian Institute of Technology (Indian School of Mines)
   Title: "A process for the development of an electric vehicle, collecting its real-time data for predicting the battery's state of health/charge"
   Abstract: A process devised for developing the low cost electric vehicle to get accurate real time data to predict the state of battery's health and the vehicle's digital twin by assembling a physical model with required sensors, battery,

microcontroller, motor controller, Bluetooth module and four DC motors in parallel and connecting the assembled physical product to the cloud through Wi-Fi/Lot whereby live data is sent to the cloud with the help of rest-API wherein the real-time data is being used to develop a machine-learning model to predict battery health with high accuracy.

2. Indian Patent Application No. 2023431004658 A dated 23.02.2024 in the name of Indian Institute of Technology (Indian School of Mines)
   Title: "Wearable Device for Fatigue Risk Management and Method of Working the Device"
   Abstract: The present invention relates to a wearable device for fatigue risk management and method of working the device. At the user layer, two wearable modules are deployed, each equipped with an array of sensors and a microcontroller unit. These modules serve as dynamic biomarkers, actively gathering and transmitting quantifiable physiological data. The wearable device function as personalized physiological monitors, offering users real-time updates on their fatigue levels and concurrently assessing ergonomic and environmental risks. The device works in four phases: fatigue detection with AI enabled microcontroller, fatigue detection, fatigue diagnosis and fatigue recovery. This invention conducts in-depth, continuous analysis to assess both short-term and long-term fatigue trends for individual users. Additionally, it extends its insights to the user, which may encompass supervisors, management, and other stakeholders. The user accesses a specialized operational dashboard, allowing for collective and individual monitoring, thus facilitating informed decision-making and enhanced workplace safety in labour-centric industries such as mining and beyond.

Journal Publications

1. Singh, S., Kumar, S. and Kumar, A. (2023), "Identifying disruptions by COVID-19 and devising strategies to build robust supply chain – a case study illustration of India's energy storage sector", *Benchmarking: An International Journal*, Vol. ahead-of-print No. ahead-of-print. https://doi.org/10.1108/BIJ-06-2023-0405. **(WoS: Q1; ABDC: B)**

2. Singh, S., Batheri, R., Dias, J. (2023), "Predictive Analytics: How to Improve Availability of Manufacturing Equipment in Automotive Firms", IEEE *Engineering Management Review*, vol. 51, no. 4, pp. 157-168, Fourth quarter, Dec. 2023, https:doi.org/10.1109/EMR.2023.3288669. **(Scopus: Q2)**

3. Singh, S., Yadav, B., Batheri, R. (2023), "Industry 4.0: Meeting the Challenges of Demand Sensing in Automotive Industry", *IEEE Engineering Management Review*, vol. 51, no. 4, pp. 179-184, Fourth quarter, Dec. 2023, https:doi.org/ 10.1109/EMR.2023.3292331. **(Scopus: Q2)**

4. Sahay, S., Kaushik, H., K., Singh, S. (2023), "Discovering Themes and Trends in Electricity Supply Chain Area Research", OPSEARCH, 60(3), 1525-1560, https://doi.org/10.1007/s12597-023-00648-x **(WoS: Q3, ABDC Ranking: C)**

5. Desai, V., Singh, S. (2022) "Assessment of Straight-Line Drawing Machine and Workforce Utilization Using Time Study, Work Sampling and Downtime Analysis in Steel Industry". *Transactions of Indian National Academy of Engineers (**INAE**)*. https://doi.org/10.1007/s41403-022-00381-9.

6. Singh, S., More, V., & Batheri, R. (2022). "Driving electric vehicles into the future with battery management systems". *IEEE Engineering Management Review*, 50(3), 157-161.https://doi.org/ 10.1109/EMR.2022.3194655. **(Scopus: Q2)**

7. Singh Smriti, Singh S., Misra S.C. (2022), "Post Implementation challenges of ERP system in pharmaceutical companies", *International Journal of Quality and Reliability Management*, *40*(4), 889-921, https://doi.org/10.1108/IJQRM-10-2020-0333. **(WoS: Q2; ABDC Rank: B)**

8. Singh S., Misra S.C., and Kumar Sameer (2022), "What does it take for your organization to institutionalize product lifecycle management?", *IEEE Engineering Management Review*, https://doi.org/10.1109/EMR.2022.3146311. **(Scopus: Q2)**

9. Singh S., Misra S.C., and Kumar Sameer (2021), "Institutionalization of Product Lifecycle Management (PLM) in Manufacturing Firms," *IEEE Transactions on Engineering Management,* https://doi.org/10.1109/TEM.2021.3097040. **(WoS: Q1; ABDC Rank: A)**

10. Singh S., Misra S.C., Chan F. T. S. (2020), "Establishment of Critical Success Factors for Implementation of Product Lifecycle Management Systems (PLMS)", *International Journal of Production Research,* https://doi.org/10.1080/00207543.2019.1605227. **(WoS: Q1; ABDC Rank: A)**

11. Singh S., Misra S.C. (2019), "Exploring the Challenges for Adopting the Cloud PLM in a Manufacturing Organization", *IEEE Transactions on Engineering Management,* https://doi.org/10.1109/TEM.2019.2908454. **(WoS: Q1; ABDC Rank: A)**

12. Singh S., Misra S.C., and Kumar Sameer. (2019), "Critical barriers to PLM Institutionalization in Manufacturing Organizations", *IEEE Transactions on Engineering Management,* https://doi.org/10.1109/TEM.2019.2911574. **(WoS: Q1; ABDC Rank: A)**

13. Singh S., Misra S.C., and Kumar Sameer. (2019), "What are the Stumbling Blocks to Making Product Lifecycle Management Routine in Organizations", *IEEE Engineering Management Review,* IEEE, https://doi.org/10.1109/EMR.2019.2912595. (**Scopus: Q2)**

14. Singh S., Misra S.C., and Kumar Sameer (2019) "Identification and Ranking of the Risk Factors Involved in PLM Implementation", *International Journal of Production Economics, Elsevier,* https://doi.org/10.1016/j.ijpe.2019.09.017. **(WoS: Q1; ABDC Ranking: A)**

15. Singh S., Misra S.C. (2018), "Migration of PLM Systems to Cloud", *International Journal of Communication Systems, 31(18), e3815 Wiley.* https://doi.org/10.1002/dac.3815. **(WoS: Q3)**

16. Singh S., Misra S.C. (2018), "Identification of Barriers to PLM Institutionalization in Large Manufacturing Organizations: A Case Study", *Business Process Management Journal, Emerald Publishers,* https://doi.org/10.1108/BPMJ-12-2017-0367. **(WoS: Q1; ABDC Ranking: B)**

Conference Publications

1. Pandey, R. D., Sarkar, P., & Singh, S. (2023), "Success Factors for the Adoption of Paperless Ecosystem in Manufacturing Firms," *2023 IEEE Technology & Engineering Management Conference - Asia Pacific (TEMSCON-ASPAC)*, Bengaluru, India, 2023, pp. 1-7, https://doi.org/10.1109/TEMSCON-ASPAC59527.2023.10531547.

2. Mukherjee, S., Sharma, A., & Singh, S. (2023) "An Overview of the Challenges to Implement Drones in the Manufacturing Industry," 2023 IEEE Technology *& Engineering Management Conference - Asia Pacific (TEMSCON-ASPAC)*, Bengaluru, India, 2023, pp. 1-6, https://doi.org/10.1109/TEMSCON-ASPAC59527.2023.10531583.

3. Dhanagare, T., Singh., S., Pandey, V. (2023), "An LSTM Driven Simulation Approach for SOC & SOH Estimation of a Lithium-Ion Cell", to be presented in International Design Engineering Technical Conferences and Computers and Information in Engineering Conference (IDETC/CIE), https://doi.org/10.1115/DETC2023-117057.

4. Ranjan, P., Chaudhari, S., Singh, S. (2023), "Challenges in Digital Transformation of Business Processes Towards Creating a Paperless Environment: Case of an Aircraft Manufacturing Firm", Presented in 2023 IEEE ETEMS 2023, IEEE European Technology & Engineering Summit, *(E-TEMS)* (pp. 85-90), https://doi.org/10.1109/E-TEMS57541.2023.10424597.

5. Singh, S., Mittal, A., Misra, S.C. (2023), "Quantifying the Implementation Risks of Product Lifecycle Management for Improved Digitalization", Presented in 2023 IEEE ETEMS 2023, IEEE European Technology & Engineering Summit, pp. 189-194, Doi: 10.1109/E-TEMS57541.2023.10424540.

6. Mukherjee, S., & Singh, S. (2021), "Agent-Based Modelling techniques in manufacturing operations overview: A Literature Review". In 2021 IEEE Region 10 Symposium (TENSYMP) (pp. 1-6). IEEE, https://doi.org/10.1109/TENSYMP52854.2021.9550902.

7. Maurya, S. and Singh, S., (2020), "Time Series Analysis of the Covid-19 Datasets", 2020 IEEE International Conference for Innovation in Technology (INOCON), Bengaluru, Nov 6-8, 2020, https://doi.org/10.1109/INOCON50539.2020.9298390.

8. Pawar N., Misra S.C., Singh S., (2020), "Assessment of Success Factors for Cloud adoption in Semiconductor Industry using Hybrid DEMATEL-ANP", *26th IEEE, ICE-ITMC Conference*, virtually hosted by Cardiff University, UK, June 15-17, 2020.

9. Singh S., Misra S.C. (2018), "Core challenges to cloud PLM adoption in large manufacturing firms", *5th IEEE -International Conference on Industrial Engineering and Applications (ICIEA), Singapore,* April 26-28, 2018, https://doi.org/10.1109/IEA.2018.8387085.

10. Singh S., Misra S.C. (2018), "Success determinants to Product Lifecycle Management (PLM) performance". *5th IEEE -International Conference on Industrial Engineering and Applications (ICIEA), Singapore,* April 26-28, 2018, https://doi.org/10.1109/IEA.2018.8387130.

11. Singh S., Misra S.C. (2017), "Challenges to Cloud PLM Adoption", *2nd International Conference on Advanced Computing and Intelligent Engineering (ICACIE), Ajmer, Rajasthan, India,* November 23-25, 2017. (Published in *Progress in Advanced Computing and Intelligent Engineering (pp. 87-96). Springer, Singapore,* winner of the ***"BEST PAPER AWARD"***.

Conference Presentations

1. Pandey, R. D. & Singh, S. "Barriers to Digitalization of the Operations Process: A Case Study Towards a Paperless Future". *POMS India International Conference,* IIM Ranchi 2024.
2. Mukherjee, S. & Singh, S. "Optimization of Blood Supply Chain by Simulation and Reducing Waste by Transshipment". *POMS India International Conference*, IIM Ranchi 2024.
3. Singh P., Goel S., Singh S., "Adoption of Dynamic User Interface Development Technology in Manufacturing Supply Chain". *Conference at HAL Management Academy*, Bangalore, 15-16 July 2022.

Published Book Chapter

1. Singh S., Misra S.C. (2019), "*Significance of cloud PLM in Industry 4.0*", Product Lifecycle Management (Volume 4): The case studies, Decision Engineering, Springer, Switzerland, pp. 249-255, https://doi.org/10.1007/978-3-030-16134-7_19
2. Singh S., Misra S.C. (2019), "*A Study Analyzing Individual Perception on PLM Benefits*", Product Lifecycle Management (Volume 4): The case studies, Decision Engineering, Springer, Switzerland, pp. 109-116, https://doi.org/10.1007/978-3-030-16134-7_9

Research Interests

- Technology and Engineering Management
- Battery Management Systems
- Big Data Analytics
- Design Thinking and Innovation
- Product Lifecycle Management
- Machine learning Applications
- Manufacturing Systems Engineering
- Health Care Prediction & Analytics
- Service Operations Management

Professional Certifications

- Certified Project Management Professional (PMP) by PMI, USA, 2021.
- Certified Enterprise Design Thinking Practitioner and Co-creator, IBM, India, 2020.
- Certification of Executive Development Program on Negotiation & Contract Administration, HAL Management Academy, Bangalore, India, 2011.
- Certified Internal Auditor for AS9100-C Quality Management System in Hindustan Aeronautics Limited, Aircraft Manufacturing Division, Nashik, India, 2012.
- Certification of Basic Management Program (2008-2009) at HAL Management Academy, Bangalore, India.
- Certification of Professional Industrial Training from Advanced Training Institute, Hyderabad, India, 2009.

Professional Memberships (Annual)

- Senior Member of IEEE.
- Member of Project Management Institute (PMI).
- Member of the Production and Operations Management Society (POMS)

Academic Achievements

- Among the top 1% of 200,000 students in Prelims and Mains exam of IIT-JEE 2004.
- Qualified the competitive exam to pursue PhD in Department of Industrial Management and Engineering in Indian Institute of Technology, Kanpur.

Languages

Hindi and English