

Interdisciplinary Knowledge Series

Industry 5.0:

*Innovative Management Practices
for Sustainable Development*

Industry 5.0:

Innovative Management Practices for Sustainable Development

- Edited by -

**Saumendra Das
Koppala Venugopal
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An Editorial

Industry 5.0 represents a transformative paradigm in the evolution of industrial systems, emphasizing the harmonious collaboration between humans and advanced technologies. Moving beyond Industry 4.0 which primarily focused on automation, digitalization, and efficiency whereas Industry 5.0 places human well-being, creativity, and sustainability at the center of technological advancement. This shift highlights a more balanced approach where technological progress is aligned with societal values and environmental responsibility.

The defining features of Industry 5.0 include a human-centric approach, sustainability, resilience, and the integration of advanced technologies such as artificial intelligence, the Internet of Things (IoT), blockchain, and big data. These elements collectively aim to create systems that are not only intelligent and efficient but also adaptive, inclusive, and environmentally conscious. In this context, management practices must evolve to facilitate meaningful human machine collaboration while ensuring ethical and responsible innovation.

A critical aspect of this transition is the transformation of workforce capabilities. Industry 5.0 emphasizes continuous upskilling and reskilling to prepare employees for collaborative roles alongside intelligent systems. It also underscores the importance of trust, safety, and transparency in human-machine interactions. Developing robust frameworks that ensure reliability, accountability, and ethical governance is essential to fostering confidence in these emerging systems.

While Industry 5.0 offers immense opportunities, it also presents significant challenges. Designing systems that enable seamless human AI interaction in complex industrial environments requires addressing issues related to usability, adaptability, and multimodal communication. Moreover, aligning rapid technological advancements with human values is crucial to avoid inequalities and ensure inclusive and equitable growth.

In parallel, the global landscape is undergoing rapid transformation across technological, economic, and environmental dimensions. Organizations must therefore embrace innovation not merely as a strategic tool but as a core philosophy for achieving sustainable development. Sustainability is no longer optional; it is a fundamental imperative. The traditional profit-centric business model is gradually giving way to a more holistic approach that integrates economic performance with environmental stewardship and social responsibility.

Innovative management practices in the era of Industry 5.0 extend beyond technological adoption. They involve reimagining organizational culture, decision-making processes, and value creation mechanisms. Concepts such as circular economy, carbon neutrality, stakeholder capitalism, and inclusive leadership are becoming central to modern business strategies. These approaches enable organizations to create long-term value while addressing global challenges such as climate change, resource scarcity, and social inequality.

Digital transformation acts as a key enabler in this journey. Advanced technologies facilitate real-time monitoring of sustainability metrics, optimize resource utilization, and enhance transparency and accountability. Data-driven decision-making empowers organizations to become more agile, efficient, and responsive to changing environmental and societal demands.

Equally important is the role of human-centered leadership. Empowering employees, fostering creativity, promoting diversity and inclusion, and encouraging ethical consciousness are essential for building resilient and future-ready organizations. Leaders in the Industry 5.0 era must balance technological advancement with empathy, vision, and responsibility.

Furthermore, education and public policy play a pivotal role in supporting this transformation. Academic institutions must prioritize sustainability literacy, innovation, and entrepreneurial thinking. At the same time, governments and regulatory bodies should create enabling environments through supportive policies, incentives, and public-private partnerships to promote sustainable innovation.

Ultimately, Industry 5.0 redefines the future of management. It is not merely about adapting to change but about leading it with purpose and responsibility. By embedding sustainability into the core of organizational strategies and leveraging innovation for societal good, businesses can contribute to building a future that is not only economically prosperous but also socially equitable and environmentally sustainable.

Editors

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About the Interdisciplinary Knowledge Series, New Delhi Publishers, New Delhi, India

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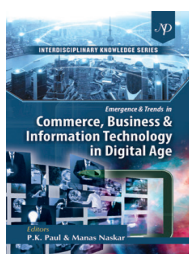


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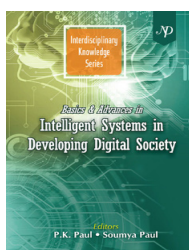


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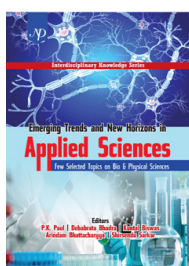


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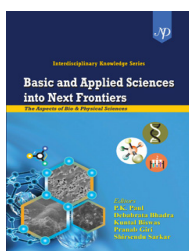


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Dr. Paul is actively engaged in the research and academic activities in the field of IST and Engineering Sciences related to Information Processing and Management. He is actively associated with Raiganj University, Raiganj, West Bengal in teaching and learning activities. He is also CEO and Vice President of IST Foundation. Virtually he is among the few Indian Information Science professionals who hold Post Graduate Qualification in all the dimensions of Information Sciences, ranging from Computer Science, Management Science, and Information Technology. He is specialized in emerging IT & Computing subjects that have social and business touch. He is mastermind for designing India's first interdisciplinary Masters (MSc) Program on Computing (MSc-Computer & Information Science) based on principles of interaction of information-technology with people. The first of its kind program has already been started in the Government University, RGU, India. He is credited with research policy paper on Cloud Computing Applications in Information Science, Systems, Information Centre, Green Computing or Green IT in Information Field/I-Schools Aspects/

Usability Engineering in Information Science and Services/HCI in Information Uses/Information Science Educational Aspects/ [IST]/Information Scientist/Geo-Information Science, Quantum Information Science and so on.

Dr. Paul holds 300 Authored Indexed, Refereed Papers, Articles, and 100+ Book Chapters to his credit and about 30 National and International Authored and Edited Books. He is Chief Editor of IJASE and IJISC, New Delhi, IRAJMSS of IRA Academy Research, India. As the Chief Editor of IJAEML of Srinivas Publications, Mangalore, India, he is dedicated to research promotions. He is also involved as Editorial Board Member and Reviewer of more than 100 National and International Journals in diverse fields ranging from Computer Science, Informatics, Management, Engineering Science to Education, Social Science, Health Science, Pharmacy, Journal of Organizational and End User Computing, International Journal of E-Adoption, International Journal of Web Services Research, International Journal of E-Health and Medical Communications, International Journal of Healthcare Information Systems and Informatics, JECO, IJIRR, IJHCITP, IJOSSP, IJMDEM, IJTHI, IJDET, IJITPM, IJISSCM, IJISSS, IJBDCN, IJWP published from United States, Dubai, India, Nigeria, South Africa and so on. He has conducted about 250+ international conferences spread over 50+ countries and events as a committee member, chair, TPC, reviewer, etc. He holds the credit of organizing about 20 Conferences (with Indian and International Institutions) just in 2021 as a Director, Program Chair, Co-Chair, General Secretary, Convener etc. and among them the important are ICRICC-2021, ISFARAC-2021, ICONAIIS-2021, IMCISMRS-21, ICARI-2021, ICONECBIT-2021, ICEAS-2021. He also served in various events as visiting, invited and guest speaker, a few important ones are ICRDSTHM-17, iCon-MESSH'19, ICCISD-2023, AMRIT-2023, NSETRAR-17, ICIRHT-17, etc.

Dr. Paul has delivered several invited talks in leading and reputed academic and industrial establishments like SRM University, Sikkim University, VIT University, Srinivas University, Mangalore University, Assam Central University, Chaitanya Deemed to be University, TCG Digital, and CloudNet India, including MMTTC of Government of India. He has received many Awards such as Best Researcher Award in Information Sciences (from IARA, Trichy), David Clark Blair Young Scientist Award in Computer & Information Science (from BSS, India), International Young Scientist Award (from ISROSET) for the contribution in Health Informatics, Citation Award (from SSCET/Sri Sai University), International Social Science and Digital Society Think Tank Award-2020, International Outstanding Research & Scientific Events Organizer-2021, Dr. Agustin Yoh International Postdoctoral Fellow Award and Fellow of Azteca University (FAU) in 2021, etc.

About the Book Editors



Dr. Saumendra Das, Ph.D., M.B.A., L.L.M

Professor & Head of the Department

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Dr. Saumendra Das is an accomplished academic and administrator currently serving as the Professor & Head of the School of Management Studies at GIET University in Gunupur, Odisha. With over two decades of experience in academia and industry, he has made significant contributions to the fields of marketing, advertising, and management education. Dr. Das holds a Ph.D., an MBA, and an LLM, reflecting a diverse and interdisciplinary academic foundation. Prior to joining GIET University in 2022, he was an Associate Professor at the Aditya Institute of Technology and Management from 2007 to 2022. His extensive experience encompasses teaching, research, and industry engagements, totaling more than 21 years in the field.

A prolific researcher, Dr. Das has authored over 130 publications, including journal articles, conference papers, and book chapters. His research interests lie in advertising, branding, marketing, tele-advertising, and tourism. Notably, he has co-authored a review on customer segmentation using data mining techniques and conducted an impact study on COVID-19 and tourism sustainability. He has also authored more than 48 books on Advertising Effectiveness, Entrepreneurship, Marketing Management and Banking and Insurance. As the Head of the School of Management Studies at GIET University, Dr. Das plays a pivotal role in shaping the academic curriculum and fostering a research-oriented environment. He is actively involved in mentoring students and guiding research projects, contributing to the academic growth of the institution. Dr. Das has participated and presented many papers in seminars, conferences, and workshops in India and abroad. He has organized many international and national conferences, FDPs and workshops in his career. He is an active member of various professional bodies

such as ICA, ISTE and RFI. In the year 2022, he has been awarded as the best teacher by Research Foundation India.

Dr. Das is actively engaged in mentoring Ph.D. scholars, guiding research in areas like the Marketing, Advertising Management, Consumer Behaviour, Digital Media, Human Resource Management and Performance Appraisal System. He has also been involved in patenting innovative methodologies, including a socio-psychometric analysis of government unemployment insurance perceptions among youth. Dr. Das is actively engaged in curricula design for various management courses such as MBA, BBA and PhD in management. He is an active management scientist dedicated his career in advancement management education with numerous transformative measures.



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Dr. KoppalaVenugopal is a prolific researcher and academic in the field of management, specializing in marketing, business analytics, and rural consumer behavior. With a Ph.D. in Management from Andhra University awarded in 2013 for his seminal work on Tribal Consumer Behaviour in Seethampeta Mandal, Srikakulam, Dr. Venugopal has built an illustrious research career marked by intellectual rigor and applied relevance. He has successfully undertaken seven major research projects, including funded projects from the University Grants Commission (UGC), Indian Council of Social Science Research (ICSSR), and the University of Gondar, Ethiopia, where he also served as a principal researcher. His ongoing ICSSR-funded project under the Vision Viksit Bharat@2047 initiative exemplifies his commitment to impactful, policy-relevant scholarship, particularly in the domain of eco-tourism and sustainable development.

Dr. Venugopal's research portfolio includes 138 publications, comprising 124 journal articles and 11 books, many of which are published in reputed national and international outlets including Scopus, Web of Science, and UGC-CARE listed journals. His works encompass a wide range of topics including marketing strategy, consumer behavior analytics, digital marketing, e-banking adoption, and rural entrepreneurship. He has presented 59 research papers at national and international conferences and has published in journals such as Parikalpana - KIIT Journal of Management, Economic Affairs, NeuroQuantology, and PalArch's Journal of Archaeology of Egypt/Egyptology. His interdisciplinary research often integrates traditional marketing theory with modern data analytics, including machine learning and predictive modelling.

In addition to publishing, Dr. Venugopal has contributed to academia by evaluating Ph.D. theses, authoring edited volumes, and mentoring researchers. His collaborative international research experience, especially in Ethiopia, has added

a global dimension to his studies in small business sustainability, cooperative development, and market structure evolution. Recognized with consecutive Best Researcher Awards in 2023 and 2024 by AITAM, Dr. Venugopal exemplifies the scholar-practitioner model. His research continues to influence academic, institutional, and policy-making circles, making him a leading voice in applied management research with a strong rural and developmental orientation.



Prof. (Dr) N.V. Jagannadha Rao, *Ph.D., M.B.A.*
Registrar
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Dr. N. V. J. Rao is a versatile personality and thought leader with more than 25 years of administrative experience across various areas as in addition to the existing profile. He has done MBA and PhD in Management. He served the GIET University, Gunupur, Odisha dating back to its inception since 1997. He has a strong moral character and integrity in handling university policies and his leadership ability is imperative for effective supervision. Since from the beginning his main motive is to help the students both in academic and non-academic problems and counsel them in shaping to be worthy in the present market conditions which helps both the students as well as the university.



Prof. Dr. Edward Roy Krishnan, MBA, MS, MPhil, DBA, EdD, PhD
Director General
European International University, Paris, France

Ky. Col. Prof. Dr. Edward Roy Krishnan built his career on a simple belief: talent is distributed equally across the world, but opportunity is not. That conviction took root during more than two decades in the classroom, teaching learners across multiple countries and watching ability go unrecognized because of geography, cost, or rigid institutional walls. It became the mission behind everything he has built since. As Founder and Director General of European International University, Paris (EIU-Paris) - www.eiu.ac, Dr. Krishnan has shown that academic rigor and accessibility can grow together instead of trading off against each other. Under his leadership, EIU-Paris has earned ACBSP programmatic accreditation, a QS Stars 5-Star rating, ASIC Premier Institution status, the BrandLaureate Best Brand Award 2025, and a place on CEOWORLD Magazine's Top 50 Business Schools for 2025. He has personally supervised and mentored more than five hundred Master's and Doctoral scholars, guided by three principles he returns to often: focus, strategy, and honesty, with care sitting quietly beneath all three. His educational philosophy is best summed up in what he calls the Theory of Making: a potter adds material to clay, but a true educator works like a sculptor, uncovering the masterpiece already inside the stone. That belief now drives IKON SKILLS™ at www.ikonskills.ac, the AI-native micro-credentialing platform he founded to close the gap between certification and real capability, built on a binary standard of Competent or Not Yet Competent, with no learner permanently defined by a single attempt.

Dr. Krishnan measures his legacy not in rankings but in doors opened, for the working professional balancing a job with study, the doctoral researcher chasing a breakthrough, and the first-generation learner reaching for something once out of reach. As he puts it, institutions may fade, but a learner whose life has been transformed creates a legacy that lasts for generations.



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Dr. Durlar Sarkar is presently working as Registrar at Raiganj University, West Bengal, India. Previously Dr. Sarkar worked at Royal University of Bhutan, DSPSR, Guru Gobind Singh Indraprastha University, New Delhi, DSMS, Durgapur, India, and other institutions and Universities. Having more than 24 years of Experience in academics and administration Dr. Sarkar has published 25 research papers in various national and international journals and presented papers in different universities including IIMs. Dr. Durlar Sarkar has published two books and supervised Ph.D. Scholars. His area of specializations are Human Resource Management, HRIS and Human Resource Audit. He has completed his Ph.D. from NBU and FDPM from Indian Institute of Management, Ahmedabad, India. Being an Administrator his key focus areas are policy making in Higher Education and University administration.

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