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Joseph Mathew
Editors

Engineering Assets and Public Infrastructures in the Age of Digitalization

Proceedings of the 13th World Congress
on Engineering Asset Management

 Springer

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Preface

The 13th World Congress on Engineering Asset Management (WCEAM-2018) was held on 24–26 September 2018 in Stavanger, Norway. It was organized and hosted collaboratively by the Cluster on Industrial Asset Management (CIAM) of University of Stavanger and the International Society of Engineering Asset Management (ISEAM).

The brief idea for organizing the World Congress in Stavanger emerged in early 2017. It gradually became a major undertaking through various dedicated tasks in 2017 and 2018. This remarkable journey took place through a demanding terrain relying much on active support, engagement, and encouragement from many sources and champions. It brought together minds and hearts of both local and global engineering asset management communities to create a meaningful and a professional event.

The World Congress was organized in 2018 under the theme of “Engineering Assets and Public Infrastructures in the Age of Digitalization”, aiming to establish a strategic fusion between leading research and modern industrial practices. It engaged domain experts from all parts of the world. It is a triumph of true passion, creative thinking, and joint commitment.

WCEAM-2018 constituted 10 keynote speakers, 25 parallel technical sessions, 106 research and industrial presentations from over 20 countries, 4 technical safaris to selected engineering sites in the region, and 3 on-site operational demonstrations. It attracted over 200 delegates from 25+ countries. Among the most popular themes of the World Congress included:

- Asset economics and decision analysis
- Asset management in Industry 4.0
- Co-value creation, organizational strategy, and new business models
- Data science, asset health, and predictive analytics
- Human capital and organizational development
- Performance measurement and management
- Modern digital applications
- Critical asset processes and process efficiency

- Dynamic modelling, simulation, and visualization
- Smarter and safer assets
- Sustainable assets and processes.

The Organizing Committee of WCEAM-2018 comprised Prof. Jayantha P. Liyanage (University of Stavanger), Frida Solbakken (Stavanger Maritime Forum), Frode Berge (Stavanger Chamber of Commerce), Per Morten Haar (Region Stavanger), Alexander Landsnes (Stavanger Forum), Ole Trætteberg (Gassco), Øyvind Rudolf Lea (Equinor), and Birger Haraldseid (Greater Stavanger). Their involvement and ideas have been very valuable all the times through the initial concept to the final event.

We gratefully acknowledge generous contributions from the primary sponsors (Rogaland county, Stavanger municipality, and Sola municipality), silver sponsor (Apply Sørco), and additional sponsor (Petroleum Safety Authority of Norway). We also received continuous support from all industrial partners of CIAM that included: Equinor, ConocoPhillips, Aker BP, DNV GL, Apply Sørco, Oceaneering, Gassco, Petroleum Safety Authority of Norway, Kverneland Group, Petrolink, Jotne, Ernst & Young, PricewaterhouseCoopers, Visco AS, VIS-M As, Stinger, and ORS Consulting.

The inaugural and keynote speakers of the event shed some light on the current importance and future prospects of various disciplines of engineering asset management. These specially invited speakers included:

- Christine Sagen Helgø (The Honourable Mayor of Stavanger)
- Prof. Marit Boysen (Rector of the University of Stavanger)
- Line Haldal Bakkevig (Vice-President, Equinor, “Digitalization towards Field of the Future”)
- Michael Campbell (Senior Director, Children’s Health Queensland Hospital and Health Service, Australia, “Innovative Health Infrastructure and Medical service solutions in the Digital age”)
- Adrian Park (Vice-President, Intergraph Norway/Hexagon PPM, USA, “Digital transformation and leveraging the Digital Twin, through the Asset life cycle”)
- Tom Eystø (CEO, Massterly, Norway, “Towards a New Maritime Adventure with Autonomous shipping and Ferry services”)
- John Woodhouse (Managing Director, Woodhouse Partnership, UK, “Don’t forget human psychology in asset management decisions – it’s not all about data and analytics”)
- Tor Kristian Gyland (CEO, Green Mountain AS, Norway, “#TheNaturalChoice: Modern Data centers for Critical assets from inside and out”)
- Anne-Lene Festervoll (Director, PricewaterhouseCoopers, Norway, “Workforce of the future” – and the Global future of HR”)
- Sverre Alvik (Director, DNV GL, Norway, “Global Energy Transition Outlook for Engineering Assets and Public Infrastructures”)
- Cato Vevatne (CEO, KVS Technologies AS, Norway, “Industrial Robotics: The Robotic Ecosystem – smart, distributed and scalable”)

- Knut Roar Wiig (CEO, Nordic Unmanned AS, Norway, “Industrial Drones: Unexplored possibilities and Industrial disruption”).

The event constituted 4 technical safaris hosted by Road Authority of Norway (Ryfast, the world’s longest underwater tunnel), IRIS Research Institute (robotic rigs and automated drilling), Oceaneering AS (eROV and integrated operations), and Green Mountain AS (data inside a mountain). The on-site demonstrations performed by KVS Technologies (industrial robotics for operational safety), Nordic Unmanned AS (industrial drones), and Teknova (Machine diagnostic) added meaningful technical insights into these new industrial technologies.

All the authors contributed professional papers with novel ideas, concepts and solutions across a range of disciplines that had scientific and pragmatic value. A specific group of experts also organized special sessions, which included: Nuclear Power Plant Monitoring and Long-Term Asset Management (by Prof. Belle Upadhyaya, University of Tennessee, USA, and Jon Kvaalem, OECD Halden Reactor Project, Norway), Asset Management for Hydro Power Sector (by Dragan Komljenovic, Hydro-Quebec, Canada), Advances in Equipment Condition Monitoring (by Thomas J. J. Meyer, Teknova, Norway), Applied Data Science (by Assoc. Prof. Antorweep Chakravorty, University of Stavanger, Norway), Macro ergonomics and Organizational issues for Human performance and Workplace safety (by Prof. Seppo Vayrynen, University of Oulu, Finland), Organizational Strategy and Entrepreneurship (by Prof. Tatiana Iakovleva, University of Stavanger, Norway), Service Innovation in Maintenance through Industry 4.0 (by IFAC TC 5.1 WG AMEST (Advanced Maintenance Engineering, Services and Technology) and IFIP WG 5.7 SIG in Service Engineering, coordinated by Marco Macchi of Politecnico di Milano, Italy; Paolo Gaiardelli of Università degli Studi di Bergamo, Italy; and Christos Emmanouilidis of Cranfield University, UK), Tunnel Safety (by Prof. Ove Njå of University of Stavanger, Norway, and Helen Roth of Tunnel Safety Cluster, Norway), and Regulations and Audits of Late life Engineering assets (by Ole Jørgen Melleby, Petroleum Safety Authority of Norway). All papers were double-blind peer-reviewed by a dedicated International Scientific and Review Panel that comprised global experts with domain expertise related to engineering, operations, and management of engineering assets and public infrastructures. Their commitment as members of the International Scientific and Review Panel was instrumental to the quality and high standard of the event.

The WCEAM-2018 administrative team made a remarkable contribution in various capacities to ensure the success of the event. The team comprised Andrew Kilmartin, Vanessa Grace Booc, Assoc. Prof. Idriss El-Thalji, Joanne Therese Taylor, Shasheema Hewapathirana, Tone Dalaker, David Martin Bø, Yasar Denis Cam, Odd Arne Nordmark, and Arun Sindre Joshi, all from University of Stavanger, Norway. In addition, professional support was also provided by Elin Paulsen of Region Stavanger, Sindre Haaland of Conventor, the Clarion Energy Hotel (World Congress venue), and Event Eye (developer of the WCEAM-2018 app). On behalf of ISEAM, additional administrative assistance was generously received from Betty Goh, Executive Assistant of the Asset Institute, Australia.

We also gratefully acknowledge the unconditional engagement and continuous support from the 2017 and 2018 Board of Directors of CIAM, and the Board of Directors of ISEAM.

In essence, all contributors and delegates of WCEAM-2018 World Congress were a part of a noble purpose. The very success of the World Congress in 2018 is truly attributable to their professional involvement and generous commitments.

It indeed was a privilege to plan, organize, and deliver such an interdisciplinary global event focussing on the emerging domain of engineering asset management, where both academic and industrial communities are challenged to think different, broaden their perspectives, and work together for the betterment of public and private sectors. This is a part of a collective professional effort to resolve industrial complexities, economic chaos, and environmental impact to make the world a more sustainable place to live.

Truly, this is all about us and our common future.

Thank you all very much !!!

Jayantha P. Liyanage

Chair, WCEAM-2018 World Congress, Former Chair of CIAM

Joe Amadi-Echendu

General Chair, WCEAM-2018 World Congress, Chair ISEAM

Joe Mathew

Co-chair, WCEAM-2018 World Congress, Founding Chair ISEAM, and CEO,
Asset Institute, Australia

Contents

Part I: Advances In Modern Engineering Assets and Infrastructure Management	
The Implementation of ISO 55000 in Small and Medium Enterprises: Requirements and Constraints	3
Ibifuro Ihemegbulem and David Baglee	
Successful Asset Management Strategy Implementation of Cyber-Physical Systems	15
Harald Rødseth and Ragnhild J. Eleftheriadis	
Drilling Performance Management Through Reliability-Based Optimization	23
Omer Faruk Ugurlu, Burak Ozdemir, and Mustafa Kumral	
An Integrated Asset Management Strategy for Transmission Line Conductors, Based on Robotics, Sensors, and Aging Modelling	30
Nicolas Pouliot, Gilles Rousseau, Daniel Gagnon, Denis Valiquette, André Leblond, Serge Montambault, and Dragan Komljenovic	
Developing a System Vision of Assets at Elia, the Belgian Transmission System Operator	39
Suzanne Guérard, Stéphanie Hammer, and Wim Michiels	
Exploitation of Compressed Natural Gas Carrier Ships in the High North	46
Marina Solesvik	
Smart Life Cycle Management of Social Housing Assets	55
Quynh T. H. To, Isam Shahrou, and Trang T. T. To	
Benchmarking for Asset Service Options and for Analysing Their Value Capture Potential	67
Helena Kortelainen, Minna Räikkönen, Pasi Valkokari, and Susanna Kunttu	

Offshore Assets in the Transition from ‘Traditional Business Practice’ to ‘Connected Business Eco-systems’	75
Jan Helge Viste and Jayantha P. Liyanage	
A Tool to Assess Learning Processes Based on the Cooperation Principle	87
Gabriela Bjørnsen, Ove Njå, and Geir Sverre Braut	
Digital Twins, a New Step for Long Term Operation of Nuclear Power Plants	96
Christophe Varé and Patrick Morilhat	
Defining Success in Air Force Infrastructure Asset Management Through Use of the Delphi Technique	104
Brendan Maestas, John Elshaw, Andrew Hoisington, and Donald Ohlemacher	
A Digital Model of Physical Assets for Long Term Network Resiliency	111
Thomas Lacroix and Pierre Stevenin	
Approach to Digital Asset Management Service Development	118
Toni Ahonen, Jyri Hanski, and Teuvo Uusitalo	
Risk Management of Complex Systems: Understanding the Difference Between Systematic and Systemic Failures	128
Jon Tømmerås Selvik and Jean-Pierre Signoret	
Sensors and Process Monitoring Models Applied for Pre-salt Petroleum Extraction Platforms Applications	137
Luigi Galotto Jr, João O. P. Pinto, Cristiano A. Quevedo, Herbert Teixeira, and Mário C. M. Campos	
Part II: Asset Economics and Costs	
Intelligent Asset Management Budgeting and Investment Decisions for the Portfolio of Health Services Assets	147
Abe Nezamian and Ian Burns	
Impact of Circular Economy on Asset Management – Lifecycle Management Perspective	156
Jyri Hanski and Pasi Valkokari	
What Is the Economic Value of Environmental Goods - And How Can This Value Be Incorporated in Public Decision-Making?	164
Kari Ella Read and Marika Karras	
Engineering and Financial Realities of Water Infrastructure in South Africa	174
Cornelius Ruiters and Joe Amadi-Echendu	

Using Total Cost of Ownership to Compare Supplier Product-Service System Offering 183
 Giuditta Pezzotta, Gianluca Pezzotta, Emanuele Dovere, Fabiana Pirola, and Paolo Gaiardelli

Reducing and Reinvesting Working Capital in Business Ecosystems . . . 192
 Matti Rissanen, Miia Pirttilä, Lotta Lind, and Timo Kärri

Total Cost of Ownership for Asset Management: Challenges and Benefits for Asset-Intensive Organizations 200
 Amir Noorbakhsh, Ian Howard, Brett Kirk, and Kerry Brown

On the Expected Monetary Value of Hydroelectric Turbine Start-up Protocol Optimisation 209
 Martin Gagnon, Denis Thibault, and Michel Blain

Economic Life-Cycle Indicators for Public School Buildings 217
 Filipa Salvado, Nuno Almeida, and Álvaro Vale e Azevedo

Using Indicators to Deal with Uncertainty in the Capital Renewals Planning of an Industrial Water Supply System: Testing the Infrastructure Value Index 226
 Joao Vieira, Nuno Almeida, Jaime Gabriel Silva, Cristina Castro, Branca Lima, and Manuela Trindade

Technico-Economic Modelling of Maintenance Cost for Hydroelectric Turbine Runners 238
 Thibaud Lamothe, Michel Blain, Martin Gagnon, Jérôme Lonchamp, and Antoine Tahan

Part III: Asset Data Management and Data Science

Introducing Lean into Maintenance Data Management: A Decision Making Approach 249
 Salla Marttonen-Arola, David Baglee, Sini-Kaisu Kinnunen, and Maria Holgado

From Data to Asset Health Management in the Context of Hydropower Generation: A Holistic Concept 258
 Olivier Blancke, Dragan Komljenovic, Antoine Tahan, Normand Amyot, Claude Hudon, Jean-François Boudreau, and Mélanie Lévesque

Lifetime Prediction as Result of Calculated Component Loads from Available System Data 267
 Lothar Wöll, Georg Jacobs, and Achim Kramer

Method to Solve a Privacy and Security Issue in Cloud for Energy Informatics 275
 Jayachander Surbiryala and Chunming Rong

A Systematic Approach to Determine the Amount of Data Required for Asset Management Decisions 283
 Brendan Maestas, Sean Stuntz, Joey Applebee, William Bentley, Jared Breuker, Andrew Davenport, and Andrew Hoisington

Top-Down Practical Methodology for the Development of Asset Information Requirements 290
 J. Heaton and A. K. Parlikad

The Use of Relational and NoSQL Databases in Industrial Asset Management 302
 Jaime Campos, Pankaj Sharma, Mikel Cañizo, Erkki Jantunen, David Baglee, Santiago Charramendieta, and Angel Conde

Leveraging Asset Management Data for Energy Recovery and Leakage Reduction 309
 Gideon Johannes Bonthuys, Petrus Blom, and Marco van Dijk

Part IV: Asset Decisions and Decision Support

Application of a Value-Based Decision-Making Process to an Industrial Water Supply System 321
 Manuela Trindade, Nuno Almeida, Matthias Finger, Jaime Gabriel Silva, Luís Ghira, and João Vieira

Serious Games for Decision-Making Processes: A Systematic Literature Review 330
 Matti Rissanen, Lasse Metso, Kalle Elfvengren, and Tiina Sinkkonen

Equipment Life Cycle Management Based on Private Blockchain and Smart Contract 339
 Guicang Peng, Songpu Ai, Li Zhang, Chunming Rong, and Tore Markeset

A Participatory Approach for Developing Decision Support Systems for Building Energy Plants 349
 Samuel Patterson, Talara Berry, and Michael Campbell

Asset Replacement Decisions in the Context of the Mining Sector 358
 M. H. C. Dakada and J. E. Amadi-Echendu

Predictive Life Cycle Forecasting: Innovative Decision-Making for Complex Asset Management in the Naval Environment 367
 Tobias Lemerande

Condition and Performance Monitoring of Emergency Shutdown Systems: Data Visualization and Analysis for Decision Support 376
 Pengyu Zhu, Jayantha P. Liyanage, and Simon Jeeves

Hybrid Modelling for Lifetime Prediction	387
Fikri Hafid, Maxime Gueguin, Vincent Laurent, Mathilde Mougeot, Nicolas Vayatis, Christine Yang, and Jean-Michel Ghidaglia	
Intelligent Decision Support for Maintenance: A New Role for Audit Trails	396
Chris J. Turner, Christos Emmanouilidis, Tetsuo Tomiyama, Ashutosh Tiwari, and Rajkumar Roy	
Part V: Asset Safety and Occupational Health	
Toxicity Limit States in Tunnel Fire Safety Designs	407
Lene Østrem and Ove Njå	
Construction Sites as Shared Workplaces – An Occupational Safety and Health Profile Based on Workplace Inspection Reports	416
Päivi Kekkonen, Arto Reiman, Seppo Väyrynen, and Hanna-Kaisa Rajala	
Common HSEQ Performance Improvement Areas Among Industrial Suppliers: A Study of Audits in a Finnish Industrial Cluster Network	423
Henri Jounila, Arto Reiman, Osmo Kauppila, and Tero Savola	
Occupational Health and Safety in the Trucking Industry – Current Trends and Future Challenges	431
Arto Reiman and Seppo Väyrynen	
Information for Managers and Experts or Communication with All Employees Within Organisations and Networks – Case HSEQ	439
Seppo Väyrynen and Heli Kiema-Junes	
Developing Students’ Working Life Knowledge and Skills at All Educational Levels	447
Maria Lindholm, Seppo Väyrynen, Liisa Kiviniemi, Eija Rajakangas, and Minna-Liisa Myllylä	
Part VI: Human Capital and Organizational Development	
Contemporary Issues of Intellectual Capital: Bibliographic Analysis . . .	457
Olga N. Korableva, Nikolay Gorelov, and Olga Kalimullina	
Maintenance Education in Engineering Programs on Bachelor and Master Level: Evidence from Finland and Sweden	465
Mirka Kans and Lasse Metso	
Managing Competence in Naval Asset Management: Professionalising Defence’s Cadre of Asset Managers for Ships and Submarines	475
Tobias Lemerande	

Master Student Teaching and Training in an International Context . . .	483
Jan Frick	
 Part VII: Asset integrity, Maintenance, and Logistics	
Development of Modern Maintenance Management Strategy for Complex Manufacturing Assets	493
Abdu Shaalan, David Baglee, Michael Knowles, and Salla Marttonen-Arola	
Design for Intelligent Maintenance: A Potential Reference Standard Complies with Industry 4.0 Requirements	500
Idriss El-Thalji, Santiago Echeverri Duque, and Helge Nordal	
From Prevent to “Predict & Prevent (PnP)”: Optimizing Oil and Gas Asset Integrity Decisions	511
Jawad Raza	
Life End Stock Need Estimation for Repairable Spare Components of Obsolete Fleet by Simulation	521
Tauno Toikka, Jouko Laitinen, and Kari T. Koskinen	
Estimating MTTF of a Component Based on Spare Parts Consumption Data	530
R. Jiang	
Clarifications of Dangerous Detected Failures of Low Demand Safety Instrumented Systems in the Oil & Gas Industry	540
Pengyu Zhu and Jayantha P. Liyanage	
Towards Establishing an Integrated Health Index for Rail Rolling Stock	548
Pieter Conradie and Johannes Jooste	
Dynamic and Modular Business Models for Maintenance	557
Mirka Kans and Anders Ingwald	
A Risk Indicator in Asset Management to Optimize Maintenance Periods	566
Vicente González-Prida, Jesús Zamora, Antonio Guillén, Joel Adams, Khairy Kobbacy, Carmen Martín, Antonio de la Fuente, and Adolfo Crespo	
Topology-Based Model of Survivability in Network Utilities	574
Pablo Martínez-Galán, Juan F. Gómez, Adolfo Crespo, Antonio de la Fuente, Vicente González-Prida, and Antonio Guillén	
Degradation Management at Nuclear Power Plants	583
John Einar Hulsund and Miki Sirola	

The Dynamic Risk Simulator – A Decision Support Tool for Rotating Equipment Integrity Management 591
 Shyam Krishna Ramanan, Jawad Raza, and Jayantha Prasanna Liyanage

Augmented Reality Technology for Predictive Maintenance Education: A Pilot Case Study 600
 Idriss El-Thalji, Mustafa Serkan Abdüsselam, Santiago Echeverri Duque, and J. P. Liyanage

Integrated Production and Maintenance Planning for Successful Asset Management Strategy Implementation 610
 Harald Rødseth, Alan Wilson, and Per Schjøberg

Dynamic Maintenance Scheduling Based on Cost Analysis and Genetic Algorithm for Offshore Facilities 618
 Guicang Peng and Tore Markeset

Integrating Maintenance into Long Term Planning 628
 Ype Wijnia

Intelligent Maintenance Practices Within Norwegian Continental Shelf Toward Industry 4.0 Vision: An Overview 636
 Helge Nordal and Idriss El-Thalji

A Predictive Maintenance Approach Toward Industry 4.0 Machines 646
 Sangje Cho, Gökan May, and Dimitris Kiritsis

Intelligent Maintenance Maturity of Offshore Oil and Gas Platform: A Customized Assessment Model Complies with Industry 4.0 Vision . . . 653
 Santiago Echeverri Duque and Idriss El-Thalji

Part VIII: Equipment and Structural Health

Bearing Failure Prediction Technique Using Exponential Moving Average Crossover Threshold with Support Vector Regression and Kernel Regression 667
 Aaron Wee Siong Phan and Andy Chit Tan

Bearing Fault Diagnosis Based on the Variational Mode Decomposition Technique 676
 J. P. Xing and T. R. Lin

Adaptive Canonical Variate Analysis for Performance Estimation with Application to Industrial Rotating Machines 685
 Xiaochuan Li and David Mba

Predictive Analytics Combining Multi-stream Data Sources 697
 R. A. Platfoot

A Probabilistic Stress - Life Model for Fretting Fatigue of Aluminum Conductor Steel Reinforced Cable - Clamp Systems 704
 Oluwafemi O. Thomas, Luc E. Chouinard, and Sebastien Langlois

Condition Assessment of Norwegian Bridge Elements Using Existing Damage Records 716
 Andreu Regué Barrufet and Ephrem Taddesse

Gas-Liquid Ratio Imbalance Indicators of a Fighter Aircraft Shock Absorber 723
 Arttu Heininen, Jussi Aaltonen, Kari T. Koskinen, and Juha Huitula

Observation and Processing of Instantaneous Frequency Variations During Bearing Tests 731
 Tor Inge Waag and Martin Hemmer

Acoustic Response of Roller Bearings Under Critical Operating Conditions 740
 Daniel Cornel, Francisco Gutiérrez Guzmán, Georg Jacobs, and Stephan Neumann

Rib-Roller Wear in Tapered Rolling Element Bearings: Analysis and Development of Test Rig for Condition Monitoring 750
 Martin Hemmer, Kjell G. Robbersmyr, Tor I. Waag, Rolf Albrigtsen, Torfinn Pedersen, Thomas J. J. Meyer, and Chloë Vercammen

Generation of a Tachometer Signal from a Smart Vibration Sensor 758
 Eric Bechhoefer and Rune Schlanbusch

Temperature Measurements as a Method for Monitoring Ropes 772
 Shaun Falconer, Ellen Nordgård-Hansen, and Geir Grasmø

Adaptive Canonical Variate Analysis for Machine Fault Detection and Identification 780
 Xiaochuan Li and David Mba

Modified Training and Optimization Method of Radial Basis Function Neural Network for Metrics Performance Guarantee in the Auto Association of Sensor Validation Tool 791
 Marco A. D. Alves, Luigi Galotto Jr, João O. P. Pinto, Herbert Teixeira, and Mário C. M. Campos

Part IX: Asset Innovation, Business Models, and Co-value Creation

A Conceptual Framework for Innovation Assessment in Firms Based on 4Cs 801
 Leila Beig

Open Innovation in Mature Industries an Example from Maritime Industry in Norway 812
 Tatiana Iakovleva, Marina Solesvik, and Odd Jarl Borch

Responsible Innovations in Healthcare Sector 820
 T. Iakovleva

The Role of Stakeholders in the Context of Responsible Innovation . . . 828
 Luciana Maines da Silva, Cláudia Cristina Bitencourt, Kadigia Faccin, and Tatiana Aleksandrovna Iakovleva

Different Perspectives for Combining Exploration and Exploitation Strategies 836
 Leila Beig and Atefeh Ghavamifar

Value Creation Mechanisms of Modularisation in the Engineering Asset Life Cycle 846
 Jarkko Pakkanen, Tero Juuti, and Timo Lehtonen

Method for Evaluating the Value of Technology in the Manufacturing Industry 855
 Janne Mämmelä, Tero Juuti, Pasi Julkunen, Pauli Lemmetty, and Jarkko Pakkanen

Co-value Creation Within the Business Model for Smart Grids: Case of Russian Autonomous Energy Complex 864
 Irina Volkova, Yegor Burda, and Elizaveta Gavrikova

The Impact of Digitalization on Product-Service System Development in the Manufacturing Industry 873
 Jyri Hanski, Helena Kortelainen, and Teuvo Uusitalo

Creating Value from Fleet Life-Cycle Data in Business Ecosystem 881
 Sini-Kaisu Kinnunen, Salla Marttonen-Arola, and Timo Kärri

Context-Awareness in Internet of Things - Enabled Monitoring Services 889
 Ali Al-Shdifat, Christos Emmanouilidis, and Andrew Starr

Part X: Sustainable Assets and Processes

Asset Management for the Energy Transition 899
 Ype Wijnia

Robust Wind Farm Layout Optimization Under Weibull Distribution by Monte Carlo Simulation 907
 Longyan Wang and Andy C. C. Tan

Science and Technology Parks as Innovation Intermediaries for Green Innovation 915
 Roberto Rivas Hermann, Elisa Thomas, and Mario Pansera

Household Energy Consumption Prediction Using Evolutionary Ensemble Neural Network 923
Songpu Ai, Antorweep Chakravorty, and Chunming Rong

Overview of the US Department of Energy Light Water Reactor Sustainability Program 932
Bruce P. Hallbert

Deep Learning for Short-Term Energy Load Forecasting Using Influential Factors 937
Cristina Heghedus, Antorweep Chakravorty, and Chunming Rong

Author Index 947