Corporate Environmental Management Information Systems:
Advancements and Trends

Frank Teuteberg
University of Osnabrück, Germany

Jorge Marx Gómez
University of Oldenburg, Germany
Table of Contents

Foreword ........................................................................................................................................... xix
Preface ............................................................................................................................................... xxii
Acknowledgment ................................................................................................................................. xxiv

Section 1
Introduction

Chapter 1
Efficiency: A Guiding Principle of Corporate Environmental Management Information Systems.... 1
Andreas Möller, Leuphana University Lüneburg, Germany

Section 2
Theoretical and Empirical Approaches

Chapter 2
Green Information Technology and Virtualization in Corporate Environmental Management Information Systems ........................................................................................................................ 23
Edward T. Chen, University of Massachusetts Lowell, USA

Chapter 3
Innovation and Sustainable Development: From Mainstream Innovation Theory to Sustainable Innovation Research ......................................................................................................................... 37
Michael von Hauff, University of Kaiserslautern, Germany
Andrea Jörg, University of Kaiserslautern, Germany

Chapter 4
How can Information Technology be Adopted by Micro-Enterprises: Guidelines for Sustainable Development .......................................................................................................................... 55
Mehruz Kamal, The College at Brockport, State University of New York, USA
Sajda Qureshi, University of Nebraska at Omaha, USA
Peter Wolcott, University of Nebraska at Omaha, USA
Chapter 5
Additional Challenges for CEMIS Due to Impacts Caused by Climate Change

Irene Antoni-Komar, Carl von Ossietzky University Oldenburg, Germany
Marina Beermann, Carl von Ossietzky University Oldenburg, Germany
Hedda Schattke, Carl von Ossietzky University Oldenburg, Germany

Chapter 6
Paving the Way towards Virtual Biorefineries

Barbara Rapp, Carl von Ossietzky University Oldenburg, Germany
Jörg Bremer, Carl von Ossietzky University Oldenburg, Germany

Chapter 7
From Traditional Non-Sustainable Production to Closed Loop Manufacturing: Challenges for Materials Management Based on PPC and EMIS Integration

Paulina Golinska, Poznan University of Technology, Poland

Chapter 8
Enterprise Architecture Applied towards Sustainable IT Governance

Karoll Haussler Carneiro Ramos, Universidade de Brasília, Brazil
Luis Fernando Ramos Molinaro, Universidade de Brasília, Brazil
Adson Silva Rocha, Universidade de Brasília, Brazil
Paulo Henrique Portela, Universidade de Brasília, Brazil
Ana Carolina Kalume Maranhão, Universidade de Brasília, Brazil
Flávio Elias de Deus, Universidade de Brasília, Brazil

Chapter 9
Investigation of Environmental Monitoring Designs for Corporate Management Information Systems

Marina G. Erechtchoukova, York University, Canada
Stephen Y. Chen, York University, Canada
Peter A. Khaiter, York University, Canada

Chapter 10
Corporate Environmental Management Information Systems Influence of Green IT on IT Management and IT Controlling

Andreas Gadatsch, Bonn-Rhine-Sieg University of Applied Sciences, Germany

Section 3
Frameworks, Reference Models & Methodologies

Chapter 11
Environmental Monitoring, Data Mining, and Dynamic Analysis

Anneke Minke, University of Hildesheim, Germany
Helmut Lessing, University of Hildesheim, Germany
Chapter 12
Structuring Information for Industrial Environmental Management .................................................. 180
   Raul Carlson, Viktoria Institute, Sweden

Chapter 13
A Framework for the Implementation of Eco-Efficient Business Systems ........................................ 198
   Maha Shakir, Zayed University, UAE

Chapter 14
Efficient Information Provision for Environmental and Sustainability Reporting .............................. 213
   Cigdem Akkaya, Technische Universität München, Germany
   Petra Wolf, Technische Universität München, Germany
   Helmut Krcmar, Technische Universität München, Germany

Chapter 15
Cooperative Inter-Municipal Waste Collection: A Multi Agent System Approach .............................. 236
   Vitoantonio Bevilacqua, Politecnico di Bari, Italy
   Francesca Intini, Università della Basilicata, Italy
   Silvana Kühtz, Università della Basilicata, Italy
   Paolo Renna, Università della Basilicata, Italy

Chapter 16
Management Instruments for Sustainable Information Systems Management ...................................... 253
   Koray Erek, Berlin Institute of Technology, Germany
   Nils-Holger Schmidt, University of Göttingen, Germany
   Rüdiger Zarnekow, Berlin Institute of Technology, Germany
   Lutz M. Kolbe, University of Göttingen, Germany

Section 4
Applications

Chapter 17
Factory Planning Based on Environmental Information: Concept and Prototype Evaluation ............. 271
   Christian Grünwald, Volkswagen AG, Germany

Chapter 18
Progression in Corporate Sustainability Reporting: XBRL Taxonomy for Sustainability Reports .......... 289
   Ralf Isenmann, Fraunhofer Institute for Systems and Innovation Research (ISIR), Germany
Chapter 19
Development of an Information System for the Assessment of Different Bioenergy Concepts
Regarding Sustainable Development................................................................. 318
Meike Schmehl, University of Göttingen, Germany
Swantje Eigner-Thiel, University of Göttingen, Germany
Jens Ibendorf, University of Göttingen, Germany
Martina Hesse, University of Göttingen, Germany
Jutta Geldermann, University of Göttingen, Germany

Chapter 20
The German Environmental Information Portal PortalU........................................... 337
Stefanie Konstantinidis, Lower Saxony Ministry of Environment and Climate Protection, Germany
Fred Kruse, Lower Saxony Ministry of Environment and Climate Protection, Germany
Martin Klenke, Lower Saxony Ministry of Environment and Climate Protection, Germany

Chapter 21
Environment-Enterprise Integration: Networked Entrepreneurial Opportunities............ 347
R.C. Michelini, DIMEC, University of Genova, Italy
R.P. Razzoli, DIMEC, University of Genova, Italy

Chapter 22
Effective Stakeholder Relations: Sustainability Reporting Topic Maps................................ 364
Hans-Knud Arndt, Otto-von-Guericke University Magdeburg, Germany
Henner Graubitz, Otto-von-Guericke University Magdeburg, Germany

Section 5
Case Studies & Pilot Projects

Chapter 23
Sustainable Supply Chain Management: Cases and Models of RFID and Information Systems
Use in Green Logistics...................................................................................... 378
Iskra Dukovska-Popovska, Aalborg University, Denmark
Malcolm Bertoni, University of Tasmania, Australia
Hans-Henrik Hvolby, Aalborg University, Denmark
Paul Turner, University of Tasmania, Australia
Kenn Steger-Jensen, Aalborg University, Denmark

Chapter 24
Eco-Industrial Parks and Application of Corporate Environmental Management Information
System in China .............................................................................................. 395
Juan Wen, Tianjin Academy of Environmental Sciences, China
Xueqiang Lu, Tianjin Academy of Environmental Sciences, China
Chapter 25
Sustainable Scorecard as an Actionable Framework for Managing Sustainability: The Case of Tube Brazil

Marlei Pozzebon, HEC Montréal, Canada
Paulina Arroyo, HEC Montréal, Canada
Angela Fleury, Fundação Dom Cabral, Brazil

Compilation of References

About the Contributors

Index