

31st International Conference of the System Dynamics Society 2013

**Cambridge, Massachusetts, USA
21-25 July 2013**

Volume 1 of 5

ISBN: 978-1-62993-691-8

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2013) by the System Dynamics Society
All rights reserved.

Printed by Curran Associates, Inc. (2014)

For permission requests, please contact the System Dynamics Society
at the address below.

System Dynamics Society
Milne Hall 300, Rockefeller College
135 Western Avenue
University at Albany
Albany, New York 12222

Phone: (518) 442-3865

Fax: (518) 442-3398

office@systemdynamics.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

| | |
|--|-----|
| Timeframe for Investing in Cyber Security Does Matter: A Brand Value Argument | 1 |
| <i>Manag Aamir, Walt Beyeler, Andjelka Kelic, Michael Mitchell</i> | |
| Improving Efficiency and Capacity in Primary Health Care in Iceland Using System Dynamics | 2 |
| <i>Bryndis Alexandersdottir, Helgi Ingason, Brynhildur Davidsdottir</i> | |
| Diabetes Learning Lab in Stella 10 | 17 |
| <i>Pedro Dagoberto Almaguer Prado, Ramiro Luis Almaguer Navarro, Pedro Dagoberto Almaguer Navarro, Ruth Raquel Almaguer Navarro, Beatriz Eugenia Navarro Vazquez</i> | |
| [Pollen Learning Lab]® To Improve the Public Education System (New) | 50 |
| <i>Pedro Dagoberto Almaguer Prado, Ramiro Luis Almaguer Navarro, Pedro Dagoberto Almaguer Navarro, Ruth Raquel Almaguer Navarro, Beatriz Eugenia Navarro Vazquez</i> | |
| The Beer Game in Stella 10 | 78 |
| <i>Pedro Dagoberto Almaguer Prado, Ramiro Luis Almaguer Navarro, Pedro Dagoberto Almaguer Navarro, Ruth Raquel Almaguer Navarro, Beatriz Eugenia Navarro Vazquez</i> | |
| A System Dynamics Approach to Clarify the Impacts of State Loans on Real Estate Market in Iran | 107 |
| <i>Yalda Amini, Sina Jangali Kasmaei, Golnoosh Sharifan, Gholamreza Eslamifar, Ashkan Aghdai</i> | |
| Towards a Dynamic Theory of Serial Insurgencies | 127 |
| <i>Edward Anderson</i> | |
| Exploring Policy and Initiative Decision Making in a Dynamic Conflict Environment | 128 |
| <i>Stefanie Anderson, Matthew Strickland, Annapriya Mazur</i> | |
| A Patient Flow Model of Singapore’s Healthcare System | 141 |
| <i>John Ansah, David Matchar</i> | |
| Policy Analysis to Boost the Adoption of Alternative Fuel Vehicles in the Colombian Market | 154 |
| <i>Laura Ardila, Carlos Franco</i> | |
| Proposal of a 'Goldilocks' Methodology for the Assessment of an International Crisis | 173 |
| <i>Stefano Armenia, Angelo De Angelis</i> | |
| The Development of Sustainable Transports Through the Right Logistics Strategy – A System Dynamics Approach | 207 |
| <i>Gerald Aschauer</i> | |
| Farmer Education Enables Precision Farming of Dairy Operations | 215 |
| <i>Atzori Alberto Stanislao, Tedeschi Luis Orlindo, Stefano Armenia</i> | |
| Ageing and the Sustainability of Public Expenditure: SD Based Policy Analysis | 226 |
| <i>Willem Auping, Erik Pruyt, Thomas Logtens</i> | |
| (Un)desired Tantalum? | 227 |
| <i>Willem Auping, Erik Pruyt</i> | |
| Modeling the Dynamics of Methylmercury Biomagnification | 228 |
| <i>N. Gizem Bacaksizlar, Nisa Onsel</i> | |
| Model Validation: Matching Data and Structure to Behavior Through Partial Model Calibration in Group Model Building Setting | 240 |
| <i>Anna Bachurina</i> | |
| Social Housing in Colombia: A Case for Social Systems Engineering | 255 |
| <i>Andrea Baena, Camilo Olaya</i> | |
| Housing Project for the Poor a Plan with No Aim | 270 |
| <i>Mohammad Mehdi Banaei, Jamshid Parvizian</i> | |
| Dynamic Impacts of Performance Based Payment System on Public Hospitals in Turkey | 280 |
| <i>Yaman Barlas, Tugrul Meker</i> | |
| Using System Dynamics to Apply Syndemic Theory to Women with and At-Risk for HIV | 306 |
| <i>Abigail Batchelder, David Lounsbury, Anton Palma, Ellie Schoenbaum, Jeffrey Gonzalez</i> | |
| Model for Calculating Operational Capacities in Service Providers Using System Dynamics | 322 |
| <i>B. F. Mauricio, Javier Orjuela Castro, Olga Romero Quiroga, Milton Herrera Ramirez</i> | |
| How a CEO Can Create a Sustainable Competitive Advantage by Modeling the Company as a Dynamic System | 347 |
| <i>Bob Berry</i> | |
| The Endogenous Genesis of Etruscan Proto-cities: System Dynamics As a Tool for Historians Abstract Paper | |
| Supporting | 365 |
| <i>Nicola Bianchi, Roberto Marcialis</i> | |
| Cooperation and Learning in Cyber Security Training Exercises | 396 |
| <i>Asmeret Bier, Ben Anderson</i> | |
| Critical Issues for Organizational Growth and Success: A Systems Thinking View using Feedback Loop Analysis | 409 |
| <i>Sumant Kumar Bishwas, Sushil Sushil</i> | |
| Developing a Fair and Robust Energy Policy | 424 |
| <i>Frank Blaskovich</i> | |
| Increasing Part-time Working Hours in the Netherlands. Identifying Policy Recommendations Through Group Model Building | 434 |
| <i>Inge Bleijenbergh, Brigit Fokkinga</i> | |

| | |
|---|-----|
| Facility Conditions: A System Dynamics Review of the CSU Capital Outlay Program and its Impacts to the CSU, Chico Campus | 454 |
| <i>Andrew Boyd</i> | |
| Does Modification of Representation Format Affect Stock–Flow Thinking? | 486 |
| <i>Friederike Brockhaus, Jana Arnold, Marcus Schwarz, Peter Sedlmeier</i> | |
| Business Competition as a Complex System: A System Dynamics Approach | 511 |
| <i>Fernando Buendia</i> | |
| Cities as Complex Systems | 512 |
| <i>Fernando Buendia</i> | |
| Application of System Dynamics for Municipal Waste Management in China: A Case Study of Beijing | 513 |
| <i>Lin Cai, Ying Liu</i> | |
| A Dynamic Simulation Model for Insulin Resistance and Type II Diabetes in the Context of Obesity | 544 |
| <i>Melike Can, Aybek Korugan, Yaman Barlas</i> | |
| Assessing Policy for Mitigating Greenhouse Gases in Electricity | 573 |
| <i>Laura Cardenas, Carlos Franco, Isaac Dyer</i> | |
| Assessing the New Electricity-market Reform in GB with the Support of SD | 574 |
| <i>Monica Castaneda, Isaac Dyer, Carlos Franco</i> | |
| Robust Workforce Planning for the English Medical Workforce | 575 |
| <i>Sion Cave, Andrew Woodward, Graham Willis</i> | |
| The Dynamics of the Organizational Culture in a Municipality | 594 |
| <i>Francesco Ceresia</i> | |
| Applying the System Dynamics Approach in Evaluating Clinical Risk Management Policies in Three Healthcare Companies | 606 |
| <i>Francesco Ceresia, Giovan Battista Montemaggiore</i> | |
| SOA Governance Dynamics for IT Organizations | 635 |
| <i>Ricardo Chaim, Claynor Mazarolo, Andre Amaro Toffanello, Janaina Laguardia Areal, Ricardo St Ciarini Puttini</i> | |
| Decision Thresholds in Developmental-behavioral Screening: Gaining Insight Through System Dynamics Modeling | 648 |
| <i>Kee Chan, Deborah Polk, Chris Sheldrick</i> | |
| Dynamic Strategies for Apartment Brand Management in Korean Housing Market | 671 |
| <i>Minji Choi, Moonseo Park, Hyun-Soo Lee, Sungjoo Hwang, Chanhuk Park</i> | |
| Exploratory Study on Emerging Market Entry Strategy - Systems Thinking Approach | 685 |
| <i>Chang-Kwon Chung</i> | |
| A Framework for Measuring the Value-Added of Knowledge Processes with Analysis of Process Interactions and Dynamics | 710 |
| <i>Jose Clintron, Wilawan Onkham, Luis Rabelo, Alfonso Sarmiento</i> | |
| Evaluating Scenarios of Capacity Expansion given High Seasonal Variability of Electricity Demand: The Case of Saudi Arabia | 730 |
| <i>Ross Collins, Waleed Gowharji, Abdulelah Habib, Rayed Alwajeel, Stephen Connors</i> | |
| Modeling Dynamic Transitions in the Global Air Transportation System | 745 |
| <i>Denes Csala, Sgouris Sgouridis</i> | |
| A System Dynamics Approach to Modeling the Global Capital Markets | 766 |
| <i>Stephen Cucchiaro</i> | |
| Addressing Stakeholder Conflicts in Rural South Africa Using a Water Supply Model | 786 |
| <i>Floortje D'Hont, Jai Clifford-Holmes, Jill Slinger</i> | |
| Pitfalls of Multi Method Modelling: Concepts and Views | 798 |
| <i>Herbert Daly</i> | |
| Reviewing the Role of Stakeholders in Operational Research: Opportunities for Group Model Building | 813 |
| <i>Vincent De Gooyert, Etienne Rouwette, Hans Van Kranenburg</i> | |
| Simulation-Based Learning Environments to Teach Complexity: The Missing Link in Teaching Sustainable Public Management | 814 |
| <i>Michael Deegan, Krystyna Stave, Roderick Macdonald, David Andersen, Minyoung Ku, Eliot Rich</i> | |
| The Challenges of the French Electricity Generation Sector: an Analysis using ESDMA | 834 |
| <i>Tristan De Wildt</i> | |
| Muwait: a System Dynamics Model for Municipal Waste Management in Italy | 857 |
| <i>Vincenzo Di Giulio, Stefania Migliavacca, Vincenzo Durante, Paolo Torelli, Michela Giuliani</i> | |
| A Supply Demand Model for Exploration of the Future of the Dutch Gas Sector | 858 |
| <i>Sibel Eker, Cornelia Van Daalen</i> | |

VOLUME 2

| | |
|---|-----|
| Using Scenario Planning Data in System Dynamics Model Building | 882 |
| <i>Ezzat El Halabi, Matthew Doolan</i> | |
| Effective Leadership using System Dynamics and the Matrix of Change | 900 |
| <i>Ahmed Elattar, Wilawan Onkham, Luis Rabelo, Muyuan Li</i> | |
| State Security Dynamics and the Impact of Intervention to Build Country Capacity | 925 |
| <i>James Enos, John Farr</i> | |
| Model-Based Strategy Design for Biowaste Recovery in Addis Ababa, Ethiopia | 938 |
| <i>Nicolas Escalante</i> | |

| | |
|--|------|
| Exploratory Dynamic Analysis of the Adoption of Biowaste Separation Behavior in Households | 967 |
| <i>Nicolas Escalante</i> | |
| Drug Addiction Rate and the State Roles in Decreasing Addiction Rate in Iran Society; System Dynamics Approach | 978 |
| <i>Ali Fahmi, Narges Bashirivand</i> | |
| Connecting Micro Dynamics and Population Distributions in System Dynamics Models | 988 |
| <i>Saeideh Fallah-Fini, Hazhir Rahmandad, Hsin-Jen Chen, Youfa Wang</i> | |
| Marketing Effectiveness Improvement Analysis Based on System Dynamics Model | 1010 |
| <i>Reza Faridyahyaie, Amin Faridyahyaie, Nader Mahmoudi</i> | |
| Value and Acceptance of System Dynamics in Business: Business Owner as SD Practitioner Perspective | 1027 |
| <i>Warren Farr</i> | |
| Using System Dynamics to Inform Scenario Planning: A Case Study | 1039 |
| <i>Charles Featherston, Matthew Doolan</i> | |
| Global Models from Malthus to C-Roads and Beyond | 1049 |
| <i>Thomas Fiddaman, Andrew Jones, John Sterman</i> | |
| Simulating the Value of Advanced Electricity Storage: Initial Results from a Case Study of the Ontario Power System | 1050 |
| <i>Andrew Ford</i> | |
| Maya Apocalypse: Results of Varying Productivity, Consumption, Impacts, and Policies | 1065 |
| <i>Tom Forest</i> | |
| Dynamic Conservation of Money | 1080 |
| <i>Douglas Franco</i> | |
| Evidence Building for Waste Prevention: Understanding the Causal Influences That Result in Waste | 1092 |
| <i>Rachel Freeman, Michael Yearworth, Maria Angulo, Tom Queded</i> | |
| Investigation of Cyberbullying Phenomenon as an Epidemic | 1111 |
| <i>Meg Fryling, Jack Rivituso</i> | |
| A Global Approach to the Optimal Control of System Dynamics Models | 1126 |
| <i>Armin Fugenschuh, Ingmar Vierhaus</i> | |
| Corporate Training Dynamics and Insights | 1141 |
| <i>Pascal Gambardella, Charles Wainwright, Helen Jones-Kelleher</i> | |
| Stretch Goals, Managerial Responses, and the Distribution of Performance | 1166 |
| <i>Shayne Gary, Miles Yang, Phillip Yetton, John Sterman</i> | |
| A Strategic Innovation System Dynamics Process Model | 1195 |
| <i>Carmine Garzia</i> | |
| Research Workforce Diversity: The Case of Balancing National vs. International Postdocs in U.S. Biomedical Research | 1236 |
| <i>Navid Ghaffarzadegan, Joshua Hawley, Anand Desai</i> | |
| Agile Project Dynamics: A System Dynamics Investigation of Agile Software Development Methods | 1237 |
| <i>Firas Glaïel, Allen Moulton, Stuart Madnick</i> | |
| Using Dynamic Stock & Flow Models for Global and Regional Material and Substance Flow Analysis - An Example for Copper Flow Model | 1266 |
| <i>Simon Gloeser, Marcel Soulier, Luis Tercero Espinoza, Martin Faulstich</i> | |
| Unlocking the Promise of Patient Engagement: the Dynamics of Patient Portal Adoption | 1286 |
| <i>Daniel Goldsmith, John Lyneis</i> | |
| Right Timing: Unseen Delays and Stocks in Implementation of Transport Systems | 1287 |
| <i>Juliana Gomez-Quintero, Laura Guzman-Abello</i> | |
| The Network Strategy of a Gas Distribution Company | 1303 |
| <i>Paulo Goncalves, Michele Brogini</i> | |
| Elicitation of Mental Models of Dynamic Systems: Do Existing Elicitation Approaches Suffice? | 1323 |
| <i>Stefan Groesser, Martin Schaffernicht</i> | |
| Nonlinear Dynamics of Ghost Busters: Detecting Fraud with System Dynamics | 1324 |
| <i>Porfirio Guevara</i> | |
| A Multi-Pathfinder for Developing Adaptive Robust Policies in System Dynamics | 1325 |
| <i>Caner Hamarat, Erik Pruyt, Erwin Loonen</i> | |
| Systems Thinking to Understand a Knowledge-producing Triple Helix Innovation Process | 1342 |
| <i>Ungkyu Han, Martin Kunc</i> | |
| The Establishment of Container-deposit on Single-use Beverage Packaging in Germany | 1343 |
| <i>Roland Maximilian Happach, Meike Tilebein</i> | |
| Innovation and Learning in Terrorist Organizations: Towards Adaptive Capacity and Resiliency | 1361 |
| <i>Nancy Hayden</i> | |
| Cultivating the Requisite Organization and System Dynamics Approaches Toward Better Organizational Performance Over Time | 1385 |
| <i>Steve Hennigan</i> | |
| Future Trends of the Automotive Li-ion Battery Supply Chain in Germany - Dynamic Effects on Raw Materials and Employment | 1392 |
| <i>Tim Hettesheimer, Christian Lerch</i> | |
| From the Archives: Models That Matter: Selected Writings on System Dynamics 1985-2010 | 1420 |
| <i>Jack Homer</i> | |
| Impacts of Knowledge Management on Customers loyalty: System Dynamics Approach | 1421 |
| <i>Jamal Hosseini Ezzabadi, Mohammad Saryazdi</i> | |

| | |
|--|------|
| Modeling the Influence of Narratives on Collective Behavior | 1440 |
| <i>James Houghton, Michael Siegel, Daniel Goldsmith</i> | |
| First Four Years: A Case Study of Starting a Social System Design Lab | 1464 |
| <i>Peter Hovmand</i> | |
| Using System Dynamics to model the HIV/AIDS epidemic in Botswana and Uganda | 1465 |
| <i>Rachel Howell, Onno Wesselink, Erik Pruyt</i> | |
| Inclusive Growth and Sustainable Finance - A System Dynamics Model | 1486 |
| <i>Joachim Block, Bo Hu, Stefan Pickl</i> | |
| Modeling Movie Release Strategies | 1504 |
| <i>Christopher Hughes</i> | |
| Strategic Resource Management under Causal Ambiguity - The Dynamic Resource-based View Approach | 1526 |
| <i>Kenneth Huh</i> | |
| Strategic Resource Management under Causal Ambiguity - An Empirical Study of Resource Management Dynamics | 1538 |
| <i>Kenneth Huh</i> | |
| An Analysis of Post-disaster Resources Supply and Work Environment for Restoration Planning of Facilities | 1558 |
| <i>Sungjoo Hwang, Moonseo Park, Hyun-Soo Lee, Sang Hyun Lee</i> | |
| Bioenergy Market Competition for Biomass: A System Dynamics Review of Current Policy | 1580 |
| <i>Jacob Jacobson, Robert Jeffers</i> | |
| The Impacts of Biomass Exploitation and Carbon Valuation on Boreal Forest Management | 1581 |
| <i>Marc Jaxa-Rozen, Muhammad Rihan Handaulah, Erik Pruyt</i> | |
| A Simulation Framework for Integrated Water and Energy Resource Planning | 1582 |
| <i>Robert Jeffers</i> | |
| Using System Dynamics to Define, Study, and Implement Smart Control Strategies on the Electric Power Grid | 1611 |
| <i>Robert Jeffers, Lyle Roybal</i> | |
| Disaggregation of a Stock Variable Based on Attribute Distribution | 1612 |
| <i>Nitin Joglekar</i> | |
| Achilles Can Catch the Tortoise: Alternative Goal-seeking Structures | 1629 |
| <i>Charles Jones</i> | |
| Social Dimension of Bio Energy Production Policy in Africa: A Systems Thinking Perspective | 1636 |
| <i>Martin Kagawa</i> | |
| Service Delivery and Service Delivery Protests in Contemporary South Africa: A Systems Perspective | 1645 |
| <i>Martin Kagawa</i> | |
| Pushing the Limits - Using System Dynamics to Forecast Short-Term Commodity Price Movements | 1654 |
| <i>Florian Kapmeier, Alexander Voigt</i> | |
| Electric Power Demand Scenarios – SD Approach | 1700 |
| <i>Vizaya Kumar Karumanchi</i> | |
| Limits to Population Growth and Water Resource Adequacy in the Nile River Basin, 1994-2100 | 1701 |
| <i>Bruce Keith, James Enos, Benjamin Garlick, Giancarlo Simmons, Daniel Copeland, Mario Cortez</i> | |
| R&D Project Portfolio in Research and Development, Part of a Whole in R&D Strategy | 1745 |
| <i>Araz Khodabakhshian, Mohsen Khosravi, Ali Mashayekhi</i> | |

VOLUME 3

| | |
|--|------|
| Adverse Selection in SME Financing: When Both Bank and Innovative Entrepreneur Lose | 1770 |
| <i>Araz Khodabakhshian, Mohsen Khosravi, Ali Mashayekhi</i> | |
| Systems Analysis of the Impacts of the Great East Japan Earthquake and Tsunami on Energy Supply System in Kamaishi-City | 1796 |
| <i>Deniz Koca, Takehiro Kawahara</i> | |
| Adaptation to Climate Change in Sub Saharan Africa. A Multi-sector Impact Analysis for Burkina Faso | 1813 |
| <i>Birgit Kopainsky, Gunda Zullich, Santiago Movilla Blanco</i> | |
| Lending to Small and Medium Enterprises: A Novel Approach to Credit Portfolio Management | 1828 |
| <i>András Kovari, Erik Pruyt</i> | |
| Diversity and Innovativeness in New Product Development Teams – Addressing Dynamic Aspects With Simulation | 1839 |
| <i>Anja Kreidler, Meike Tilebein</i> | |
| Dynamic Demand Modeling of Freight Fleets | 1856 |
| <i>Andre Kuehn, Michael Krail</i> | |
| Process Insights from Using Group Model Building to Address Emergency Department Use for Pediatric Asthma Treatment | 1868 |
| <i>Jill Kuhlberg, Jeanine Arrighi, Cindy Pulley, William Kincaid</i> | |
| Keeping Students with the Curriculum: Using a Systems Dynamics Approach to Elementary Education | 1892 |
| <i>Jurgen Kuipers, Anika Rose</i> | |
| Limits to Planetary Fresh Water Use: A Multi-Model Investigation | 1923 |
| <i>Jan Kwakkel, Jos Timmermans</i> | |
| Teaching Characteristics of Complex Systems in K-12 Education: Lessons Learned | 1944 |
| <i>Anne Lavigne, Jennifer Andersen, Lees Stuntz</i> | |
| Regional Strategic Industry (RSI) Promotion Projects and Their Impact on Regional Economic Growth | 1955 |
| <i>Man-Hyung Lee, Nam Hee Choi, Won-Gyu Ha</i> | |

| | |
|---|------|
| Construction of a Dynamic Model for Evolution of Korea Mobile Industry Ecosystem by System Dynamics | 1975 |
| <i>Seonghwi Lee, Myoung Ho Lee, Hoon Huh</i> | |
| Modelling Sovereign Debt Induced Banking Crises: Theory, Application and Policy Conundrums | 1976 |
| <i>Jide Lewis</i> | |
| Policy Simulation in a Warzone: System dynamics in Afghanistan | 1992 |
| <i>Corey Lofdahl</i> | |
| Exploring Carbon Futures in the EU Power Sector | 2000 |
| <i>Erwin Loonen, Erik Pruyt, Caner Hamarat</i> | |
| Eramat! A Culturally-Anchored Board Game Simulator for Maasai Pastoralists in Southern Kenya | 2016 |
| <i>Jacob Loorimirim Mayiani, Michael Deaton, Jennifer Coffman, Alexandra Hickling</i> | |
| Burnout and Floating Goals in High-Contact Service Operations | 2028 |
| <i>Luis Lopez, Roy Zuniga</i> | |
| Group Model Building to Support Interdisciplinary Theory Building | 2047 |
| <i>Luis Luna-Reyes, Weijia Ran, Holly Jarman, Jing Zhang, Deborah Andersen, Giri Tayi, Djoko Sayogo, Joanne Luciano, David Andersen</i> | |
| A Comprehensive Systems Approach to Understanding Large-Scale Biofuels Deployment in the US | 2064 |
| <i>Len Malczynski, Todd West</i> | |
| High-Value Outsourcing: Impact of Team Structure and Capabilities on Complex and Uncertain Offshoring Projects Abstract Supporting | 2072 |
| <i>Abhijit Mandal, Saikat Chaudhuri</i> | |
| Supporting Policy Analysis in the Dutch Rail Sector Using System Dynamics | 2073 |
| <i>Aster Mammaerts, Cornelia Van Daalen, J. Van Luipen, S. A. Meijer</i> | |
| A Dynamic Performance Management Approach to Evaluate and Support SMEs Competitiveness: Evidences from a Case Study | 2093 |
| <i>Milica Marinkovic, Federico Cosenz, Carmine Bianchi</i> | |
| Analysis of a Serious Accident Emergency Drill with a Simulation Model | 2118 |
| <i>Angela Martin-Mendez</i> | |
| Critical Success Factors of the Offshore Outsourcing of Software Development Projects: A System Dynamics Approach | 2125 |
| <i>Frederic Mayrand, Luc Cassivi, Martin Cloutier</i> | |
| Exploring Strategic Responses of the Automotive Industry During the Transition to Electric Mobility: A System Dynamics Approach | 2151 |
| <i>Christoph Mazur, Marcello Contestabile, Gregory Offer, Nigel Brandon</i> | |
| A Preliminary Qualitative Model for the Availability of Climate Adaptation Finance in Developing Countries | 2174 |
| <i>Karen Meijer, Maaïke Van Aalst, Aleksandra Dobrevá</i> | |
| Individual Performance in the Beer Game: Underweighting the Supply Line and the Impact of Personality | 2186 |
| <i>Brad Meyer, Radosława Purvanova</i> | |
| Transformative Quality of Doctoral Education: the Way New Standards Are Negotiated. System Dynamics Approach | 2205 |
| <i>Birute Mikulskiene, Daiva Mazrimiene</i> | |
| Anticipating Complex Behaviors of Coercive Actions in International Relations | 2217 |
| <i>Amir Mohammadshirazi, Gholamreza Eslamifard, Masoomeh Khandan, Ashkan Aghdai</i> | |
| Dynamics of the Transition Towards Alternative Fuel Vehicles in Advanced and Emerging Markets | 2218 |
| <i>Edmundo Molina</i> | |
| Deduction and Abduction in Computer Simulation: Comparing Logics in Theory Development | 2250 |
| <i>Edoardo Mollona</i> | |
| A System Dynamics Analysis of the Bottled Water Industry in the United States | 2281 |
| <i>Brendan Moloney, Matthew Doolan, Barry Newell</i> | |
| Modeling the Evolution of a Science Project in Software-Reliant System Acquisition Programs | 2293 |
| <i>Andrew Moore, William Novak</i> | |
| A System Dynamics Model for Investigating Early Detection of Insider Threat Risk | 2319 |
| <i>Andrew Moore, David Mundie, Matthew Collins</i> | |
| From the Archives: the Dynamics of Action-oriented Problem Solving: Linking Interpretation and Choice | 2343 |
| <i>J. Bradley Morrison, Jenny Rudolph, John Carroll</i> | |
| Debriefing as a System: Enhancing Reflection in Experiential Learning | 2344 |
| <i>J. Bradley Morrison</i> | |
| Applying System Dynamics to Simulate Iran's Engineering Post Graduates Employment Status | 2345 |
| <i>Ali Moslemini, Mohammad Owlia, Khadijeh Gholami</i> | |
| Cost of Malaria Elimination in Kenya by Means of IVM Implementation | 2363 |
| <i>Santiago Movilla Blanco</i> | |
| Translating Between Laplace Domain Block Diagrams and System Dynamics Stock & Flow Diagrams | 2383 |
| <i>Rohit Mundra, Khalid Saeed</i> | |
| South African Green Economy Model (SAGEM) | 2384 |
| <i>Josephine Musango, Alan Brent, Andrea Bassi</i> | |
| System Dynamics Model of Residential and Commercial Lighting Markets | 2408 |
| <i>Robert Nachtrieb</i> | |
| A System Dynamics Model of Salt Reduction at a National Level | 2437 |
| <i>Nobuo Nishi</i> | |
| Fuzzy Systems Perspectives on Cognition, Economics and Machines in Organizations | 2448 |
| <i>Farley Nobre, Romeu Telma</i> | |

| | |
|---|------|
| Electricity Market Coupling: Latin America vs. Europe | 2462 |
| <i>Camila Ochoa, Ann Van Ackere</i> | |
| Policy in Adaptive Financial Markets—The Use of Systemic Risk Early Warning Tools | 2490 |
| <i>Mikhail Oet, Dieter Gramlich, Stephen Ong</i> | |
| A System Dynamics-based Model of the Socio-technical Systems of Household Energy and Carbon Emissions | 2542 |
| <i>Michael Oladokun, Ibrahim Motawa, Phillip Banfill</i> | |
| A System Dynamics Approach to the Expansion of Liquefaction Capacity in the LNG Industry | 2553 |
| <i>Yris Olaya, Sebastian Osorio</i> | |
| Evaluation of Alternative Dynamic Behavior Representations for Automated Model Output Classification and Clustering | 2575 |
| <i>Nisa Onsel, Emre Onsel, Gönenç Yucel</i> | |
| Bayesian Parameter Estimation of System Dynamics Models Using Markov Chain Monte Carlo Methods: An Informal Introduction | 2595 |
| <i>Nathaniel Osgood, Juxin Liu</i> | |
| Equivalent System Dynamics Model for Reliability Assessment | 2614 |
| <i>Juan Osorio, Marcela Narvaez</i> | |
| Complexity-Based Gaming Approach to Improve Learning from Simulation Games | 2615 |
| <i>Onur Ozgun, Yaman Barlas</i> | |
| Flood Damage in Bangkok: Disaster Or An Opportunity for Creative Destruction | 2640 |
| <i>Sarun Paisarnsrisomsuk, Khalid Saeed, Peerapas Thongsawas, Pitchaya Wiratchotisatian</i> | |

VOLUME 4

| | |
|--|------|
| Perception is More Than Time Delays | 2670 |
| <i>Ozge Pala, Etienne Rouwette</i> | |
| The Shift to Land Value Taxation: A Tale of a Different Future | 2671 |
| <i>George Papachristos, Christos Vasilopoulos</i> | |
| A System Dynamics Approach on Green Car Diffusion Strategy and the Korean Case | 2682 |
| <i>Kyungbae Park</i> | |
| Empirical Study of Design-Construction Feedbacks in Building Construction Projects | 2696 |
| <i>Kiavash Parvan, Hazhir Rahmandad, Ali Haghani</i> | |
| The Marijuana Market in Mexico: A System Dynamics Perspective | 2728 |
| <i>Gloria Perez Salazar</i> | |
| An Overview of the Biomass Scenario Model | 2754 |
| <i>Steve Peterson, Brian Bush, Emily Newes, Danny Inman, David Hsu, Laura Vimmerstedt, Dana Stright</i> | |
| Cycles in Casualty: An Examination of Profit Cycles in the Insurance Industry | 2833 |
| <i>Kawika Pierson</i> | |
| Re-Scaling the Parents as Teachers Program in Missouri | 2869 |
| <i>Madeleine Polk, Mary McMiller, Josh Jennemann, Xiao Zhu</i> | |
| Developing Capacity for Systems Thinking in Schools | 2893 |
| <i>Madeleine Polk</i> | |
| Model-based Policing to Fight High Impact Crime | 2917 |
| <i>Erik Pruyt, Marleen Ribbens</i> | |
| Doing More with Models: Illustration of a SD Approach for Exploring Deeply Uncertain Issues, Analyzing Models, and Designing Adaptive Robust Policies | 2918 |
| <i>Erik Pruyt, Jan Kwakkel, Caner Hamarat</i> | |
| Small SD Models for BIG ISSUES - The Book | 2941 |
| <i>Erik Pruyt</i> | |
| Anticipating Future of Android: Role of Quality Gatekeeping | 2971 |
| <i>Abhinay Puvvala, Rahul Roy</i> | |
| Study of Information Spreading on Micro-blogging based on SEIR Model | 2988 |
| <i>Ying Qian, Nan Zhang, Shengxin Chen, Jianguo Jia</i> | |
| System Dynamics Based Simulation for Airport Revenue Analysis | 2997 |
| <i>Jing Qin, Doina Olaru</i> | |
| System Dynamics and Stock Markets | 3020 |
| <i>Martin Rafferty</i> | |
| Modelling the Raw Water Demand of a Dry-Cooled, Coal-Fired Power Plant: A System Dynamics Approach | 3042 |
| <i>Akashnie Raghu, Nalini Pillay</i> | |
| Estimation of Unknown Parameters in Dynamic Models Using the Method of Simulated Moments (MSM) | 3063 |
| <i>Hazhir Rahmandad, Mohammad Jalali, Hamed Ghodduzi</i> | |
| Supply-Chain Transparency and Governance Systems: Market Penetration of the I-Choose System | 3070 |
| <i>Weijia Ran, Holly Jarman, Luis Luna-Reyes, Jing Zhang, Deborah Andersen, Giri Tayi, Djoko Sayogo, Joanne Luciano, David Andersen</i> | |
| 2052 – A Global Forecast for the next Forty Years Using a Mix of Models | 3093 |
| <i>Jorgen Randers</i> | |
| Effects of Aging Resources on Firm and Industry Dynamics | 3123 |
| <i>Scott Rockart</i> | |
| A System Dynamics Study of Uranium and the Nuclear Fuel Cycle | 3124 |
| <i>Matthew Rooney, William Nuttall, Nikolas Kazantzis</i> | |

| | |
|--|------|
| Abstract System Dynamics and its Application to Corporate Governance Analysis | 3144 |
| <i>Bertrand Rossert</i> | |
| Adapting ‘Agility’ to Healthcare Service Delivery | 3154 |
| <i>Tom Rust, Khalid Saeed, Isa Bar-On, Oleg Pavlov</i> | |
| Simulation of Transitions Towards Emission-Free Urban Transport | 3202 |
| <i>Sampsa Ruutu, Heidi Auvinen, Anu Tuominen, Toni Ahlqvist, Juha Oksanen</i> | |
| Employment-Centred Stabilisation Policy Propelling the Economy to “Escape Velocity” | 3224 |
| <i>Alexander Ryzhenkov</i> | |
| Modeling and Comparing a Startup Dynamics in the US and Egypt | 3254 |
| <i>Fady M. Saad</i> | |
| Three Slices of Jay Forrester’s General Theory of Economic Behavior: An Interpretation | 3298 |
| <i>Khalid Saeed</i> | |
| A Risk-based Evaluation of Policies for Sustainable Water System Design in the Kingdom of Saudi Arabia | 3329 |
| <i>Vivek Sakhrani, Ahmad Alabdulkareem, Adnan Alsaati, Anas Alfaris, Noelle Selin, Olivier De Weck</i> | |
| Knowledge Analysis in Coupled Social-ecological Systems | 3343 |
| <i>Maria Saldarriaga, Birgit Kopainsky, Stephen Alessi</i> | |
| Freight Vehicle Circulation Restriction Policy in an Emerging Country Metropolitan Area: Undesired Impacts | 3370 |
| <i>Lars Sanches, Orlando Lima, Janaina Pinto</i> | |
| Case Study: Scenario and Risk Analysis in the Pulp Industry using System Dynamics and Monte Carlo Simulation | 3383 |
| <i>Erico Santos, Gustavo Galli, Taly Nahmias, Rodrigo Stenra, Julianne Archipavas</i> | |
| Simulating Government Policies for the Ethanol Market in Brazil | 3393 |
| <i>Erico Santos</i> | |
| Exploring the Mutual Benefits of Collaboration with Concept Mapping – Preliminary Results and Some Puzzles | 3408 |
| <i>Martin Schaffernicht, Bärbel Furstenau</i> | |
| Absent Or Distant? On the Use of Indirect Causal Links and Chains of Causal Links to Compare Mental Models of Dynamic Systems | 3430 |
| <i>Martin Schaffernicht, Stefan Groesser</i> | |
| Learning Objectives for Successive Development Stages of System Dynamics Competency | 3453 |
| <i>Martin Schaffernicht, Stefan Groesser</i> | |
| Participatory Modeling in Environmental Systems: Learning from the System Dynamics Tradition | 3463 |
| <i>Laura Schmitt Olabisi</i> | |
| Effects of Illustrations, Specific Contexts, and Instructions: Further Attempts to Improve Stock–Flow Task Performance | 3471 |
| <i>Marcus Schwarz, Saskia Epperlein, Friederike Brockhaus, Peter Sedlmeier</i> | |
| Evaluating Long-term Impact of Qualitative System Dynamics Workshops on Participant Mental Models | 3503 |
| <i>Rodney Scott, Robert Cavana, Donald Cameron</i> | |
| Visual Integration with Stock-flow Models: How Far Can Intuition Carry Us? | 3515 |
| <i>Peter Sedlmeier, Friederike Brockhaus, Marcus Schwarz</i> | |
| Poultry Supply Chain: A System Approach | 3530 |
| <i>Mohammad Shamsuddoha, Mohammed Quaddus, Desmond Klass</i> | |
| A Model-based Study and Policy Analysis of Domestic Violence and Sexual Harassment Against Women and Children | 3547 |
| <i>Mahtab Sharifi, Irene George, Erik Pruyt</i> | |

VOLUME 5

| | |
|---|------|
| Eco-Eco-System Dynamics | 3572 |
| <i>John Shilling</i> | |
| An Analysis of Mental Process within Construction Workforces for Project-level Safety Management | 3589 |
| <i>Mingyu Shin, Hyun-Soo Lee, Moonseo Park, Seulbi Lee</i> | |
| A System Dynamics Approach to Assess the Impact of Policy Changes in the Icelandic Demersal Fishery | 3604 |
| <i>Sigríður Sigurðardóttir, Jónas Vioarsson, Sveinn Margeirsson</i> | |
| Extending Opinion Polls through the Combination of Analytical and Simulation Models | 3614 |
| <i>Bruce Skarin, Robert McCormack, Ian Yohai</i> | |
| Third Generation University Strategic Planning Model Development | 3621 |
| <i>Valerijs Skribans, Amis Lektuers, Yuri Merkurjev</i> | |
| Organisational Flexibility : A Simulation Model | 3628 |
| <i>Amaia Sopelana, Martin Kunc</i> | |
| A Dynamic Analysis of Socio-Technical Transition towards Bio-Economy | 3659 |
| <i>Tomi Sorasalmi, Riitta Nieminen-Sundell, Peter Ylen</i> | |
| A System Dynamics Approach to Enhance Tourism Service Delivery Performance through Value Co-Creation | 3680 |
| <i>Mona Soufivand, Enzo Bivona, Marco Alessi</i> | |
| The Capability Trap and Implementation of Evidence-based Practice in Child Protective Services | 3705 |
| <i>Mary Jo Stahlschmidt</i> | |
| When Your Goals Do Not Address Your Concerns: Lessons Learned from a Mediated Model to Support Regional Planning in Wellington | 3706 |
| <i>Hendrik Stouten, Marjan Van Den Belt, Vicky Forgie</i> | |
| Fearless Use of System Dynamics in Education – How You Can Make a Difference! | 3725 |
| <i>Lees Stuntz, George Richardson, Peter Hovmand, Anne Lavigne, Paul Newton</i> | |

| | |
|--|------|
| Impact of Flexibility on Risk Management in an Indian Pharmaceutical Manufacturer – A System Dynamics Approach | 3726 |
| <i>Sushil Sushil, Arnab Mitra</i> | |
| Do People Possess a Global and Ordinal Understanding of Accumulation? An Experimental Study | 3752 |
| <i>Mihaela Tabacaru, Helen Fischer</i> | |
| Dynamic Modelling of User Satisfaction: the Case of the Bangkok Mass Transit System (BTS) | 3767 |
| <i>Worapong Tangkitsiri, Stephen Ogunlana, Adekunle Oyegoke, Michael Oladokun</i> | |
| Teaching Top-down Modeling to Bottom-up Thinkers: A Report from the Initial Phase of a Collaborative Watershed-modeling Project | 3776 |
| <i>Melanie Thornton, Liz Allen, Allyson Beall</i> | |
| System Dynamics Endogenous Mental Models | 3790 |
| <i>Warren Tignor</i> | |
| Assessing Future Carbon Emissions from Fossil Fuels of China | 3810 |
| <i>Hefeng Tong, Weishuang Qu, John Shilling</i> | |
| A Shock to the System: How can Land Value Taxation change the Face of Cities? | 3820 |
| <i>Georgios Tsaples, Erik Pruyt, András Kovari, Christos Vasilopoulos</i> | |
| Epidemiology of Cytomegalovirus | 3836 |
| <i>George Tsaples, Meropi Nassikas</i> | |
| Dynamics of Consumerism and Credit Card Debt under the Influence of Advertising | 3852 |
| <i>Ozlem Turan, Dolunay Ugur, Yaman Barlas</i> | |
| An Investigation into Land Use Changes and Consequences in the Northern Great Plains Using Systems Thinking and Dynamics | 3868 |
| <i>Ben Turner, Luis Tedeschi, Roger Gates, Tim Nichols, Melissa Wuellner, Barry Dunn</i> | |
| Integrating Economics and System Dynamics Approaches for Modeling an Ecological-Economic System | 3898 |
| <i>Takuro Uehara, Yoko Nagase, Wayne Wakeland</i> | |
| On Component Based Modeling Approach using System Dynamics for The Financial System (With a Case Study of Keen-Minsky Model) | 3917 |
| <i>Ginanjar Utama</i> | |
| Solution-oriented Systems Thinking Archetypes; Examples of the Manawatu River, New Zealand | 3947 |
| <i>Marjan Van Den Belt, Vicky Forgie, Mike Scott, Anna Frampton, Ahmad Obeidat</i> | |
| The Eye of the Beholder: Exploring the Dynamics of Regional Differences in Cataract Treatment | 3967 |
| <i>Bert Van Nistelrooij, Etienne Rouwette, Jac Vennix, Ilse Verstijnen</i> | |
| Legalization of Cannabis in the USA: A System Dynamics Approach to Drug Policy | 3968 |
| <i>Rick Van Stavereen, Andrew Thompson</i> | |
| Stress-Testing Banks under Deep Uncertainty | 3996 |
| <i>Christos Vasilopoulos, Erik Pruyt, Tushith Islam</i> | |
| Implications of The Rate of Organizational Learning on Value Capture in the Digital Economy | 4020 |
| <i>Mona Vernon</i> | |
| Exploring Retailer’s Ordering Decisions under Delays | 4047 |
| <i>Sebastian Villa, Paulo Goncalves, Santiago Arango</i> | |
| A System Dynamics Examination of the “Spirit of Capitalism” | 4080 |
| <i>John Voyer, Herbert Smoluk</i> | |
| The Utilization of System Dynamics in Concluding Policies for Greater Cairo Sustainable Development | 4088 |
| <i>Khaled Wahba, Naglaa Fahmy</i> | |
| Modeling Opioid Addiction Treatment Policies Using System Dynamics | 4118 |
| <i>Wayne Wakeland, Alexandra Nielsen</i> | |
| Systemic Analysis in Legislating: Modeling the “Cash for Clunkers” Stimulus | 4136 |
| <i>Tao Wang, Chester Labeledz</i> | |
| Teaching Policy Design, Using a Case Study of Unintended Consequences when the EU Regulates Hospital Doctors’ Hours | 4160 |
| <i>David Wheat, Aklilu Tadesse, Mang Li, Glenn Lewis</i> | |
| The Top 7 Myths About System Dynamics | 4185 |
| <i>J. Chris White, Robert Sholtes</i> | |
| Dynamic Drivers of Successful Social Impact Bonds | 4186 |
| <i>Robert White, David Ford</i> | |
| The Dynamics of Indonesian’s Currency Crisis in 1997 | 4210 |
| <i>Gunawan Wicaksono</i> | |
| Large System Transformation within Healthcare Organizations Utilizing Lean Deployment Strategies | 4240 |
| <i>Heather Woodward-Hagg, Isa Bar-On</i> | |
| If the Hillock Does Not Survive, the Community Does Not Survive: Insights from the SD Winter Institute in Andhra Pradesh | 4262 |
| <i>Zhu Xiao, Masha Serdyukova, Rachel Binstock</i> | |
| Modeling the Nuclear Fuel Cycle: Agent Based | 4283 |
| <i>Abdellatif Yacout</i> | |
| Developing "System Dynamics-based" Flexible Strategy Game-card: Exploring Performance of the Indian Telecom Service Providers | 4284 |
| <i>Neetu Yadav, Sushil Sushil</i> | |
| Exchange Rates and Deindustrialization: Japanese Experiences | 4303 |
| <i>Takayuki Yamashita</i> | |

| | |
|---|------|
| A Case Study of the Value-driven Feedback System for Quality Culture Improvements in the Project-based Organizations | 4317 |
| <i>Min-Ren Yan, Hsin-Ke Lu, Yi-Hsiu Cheng</i> | |
| Control Formulations for a Stock Management Problem with a Delay in Measuring and Reporting | 4318 |
| <i>Hakan Yasarcan, Taner Bilgic</i> | |
| Facilitating Diffusion of Innovations Through Niche Management Strategies | 4319 |
| <i>Gönenç Yuçel</i> | |
| Exploration of the Effects of Open Innovation Policies on National Innovation Systems through System Dynamics Simulation: Applying the Results to Cambodia | 4343 |
| <i>Jinhyo Yun, Dong Kyu Won, Byung Yong Hwang, Wooyoung Jung, Dong-Hwan Kim</i> | |
| Strategies for University Growth: A System Dynamics Analysis of Organizational Change | 4367 |
| <i>Raafat Zaini, Michael Radzicki, Khalid Saeed, Oleg Pavlov, Allen Hoffman, Kristin Tichenor</i> | |
| Simulation for Assessing the Liberalization of Biofuels | 4402 |
| <i>Isaac Dyner, Carlos J. Franco, Sebastian Zapata</i> | |
| Determinants of Requirements Process Improvement Success | 4427 |
| <i>Aminah Zawedde, Ddembe Williams</i> | |
| Integrated Water Resources Management Incorporating Water Quality, Energy Consumption and Ecological Requirement | 4443 |
| <i>Yilin Zhuang, Qiong Zhang</i> | |
| Monetary Incentives as a Fix that Fails with Reciprocal Employees | 4454 |
| <i>Nicole Zimmermann</i> | |
| Author Index | |