SUSTAINABLE APPROACHES TO SYSTEM IMPROVEMENT

Time and Place: Room 1080 Grainger, TR, 1:00-2:15
Course number: 12705

SYLLABUS

Mark P. Finster
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Course Purpose and Content
The course discusses cutting-edge approaches organizations engage to embed sustainable practices into their behavior and their systems. We present, critique and integrate several sustainability perspectives, including scientific, social, environmental and promotional viewpoints. Approaches include methodology that addresses quality, productivity, cost, lean, profit, brand image, quick response, customer satisfaction and retention, value creation, stakeholder satisfaction, theory of constraints, supply chain management, marketing, management, accounting, base of the pyramid, triple bottom line, engineering, operations and health care.

Organizations face rising prices, increasing demand and dwindling supplies of both renewable biomass and nonrenewable fossil fuels, metals and minerals. Deterioration of natural capital, climate, forests, oceans/fish, biodiversity, air, soils, the ozone layer, waste management, chemical build-up and desertification all pose significant human threats and tighten both market requirements and regulations. Furthermore, daily one billion people face hunger while 4.5 billion make less than ten dollars and are mostly ignored by modern economic systems. Sustainability approaches include (1) sourcing resources renewably and through reuse to maintain and restore natural capital and biodiversity, while dramatically reducing material, energy and water flows from natural sources, (2) managing all outputs to maintain their value throughout and beyond their lifecycle, ensuring that all outputs are entirely consumed safely, without increasing concentrations in the natural world, and (3) extending value creation principles to all stakeholders, including those at the base of the pyramid and those living in the future. Sustainability benefits include innovative services and products, new markets and increased market share, dramatic cost reduction, improved employee productivity, satisfaction and retention, reduced risk, and enhanced creativity through innovative conceptualization, collaboration and learning.

Systems typically involve multiple stakeholders with different and conflicting objectives, several organizational functions and than one level of management. This course addresses sustainable value-creation approaches that seek to improve multiple system performance objectives in order to satisfy both stakeholder and customer groups, including those at the base of the pyramid. Sustainable value-creation involves a strategic system-wide perspective as well as a focus on individual customer and stakeholder segments. System-wide approaches include both breakthrough and incremental improvement, analytical techniques for analyzing and changing operations, supply and customer chains, sustainability principles and analysis, data-based participatory decision making, creativity techniques for innovative design of processes and systems, and methodology for employee involvement and empowerment. Pedagogy also addresses supportive organizational structures and policy issues.

The course discusses embedding sustainable improvement into the generative processes of mission-central complex systems in a variety of contexts, industries and ownership structures by engaging and strengthening a wide range of improvement approaches. Application includes
• integration, development and improvement of multiple performance objectives including sustainability, profitability, market growth, agility and response time, quality, cost reduction, brand image, safety, quality of work, customer satisfaction and value creation.

• several approaches to finding leverage and developing strategy, including sociological methods such as social network analysis and communication theory, economic methods such as lean and cost-value analysis, scientific and system stratification approaches, theory of constraints and bottleneck analysis, flow and organizational structure analysis, sustainability principles and methods and their integration into mission-central activities, statistical analysis and systems thinking.

• different organizational and job functions including leadership, human resource management, engineering, supply-chain management, marketing, sales, accounting, finance, production, and customer service

• varied industries such as service, manufacturing, health care, government, retail, banking, real estate, insurance, education and publishing

• a variety of ownership structures, both public and private, profit and not-for-profit

Contacting the professor
You may reach Professor Mark Finster at:

Office: 4250D Grainger Hall Office hours: T, Th: 11:00 – 12:45
Email: mfinster@wisc.edu and by appointment

Biographical sketch
Mark P. Finster serves in the Graduate School of Business and the College of Engineering at the University of Wisconsin-Madison, and is a contributing member in the Gaylord Nelson Institute for Environmental Studies, the Center for Quality and Productivity Improvement, the Energy Institute, the Consortium for Global Electronic Commerce, and the Center for Quick-Response Manufacturing. He also serves on the executive boards of the Center for Operations and Technology Management, the Global Studies program, and Manufacturing Systems Engineering.

Professor Finster has received the Gaumnitz Distinguished Faculty Award and the Mabel W. Chipman Excellence in Teaching Award and has helped improve the management systems of more than 150 businesses, government agencies, and nonprofit organizations from four continents.

Professor Finster received his Ph.D. from the University of Michigan and has served as a professor at Cornell and Johns Hopkins Universities. He is a five-time National Science Foundation (NSF) Scholar and chaired the NSF session that established a national research program in organizational excellence. He also served on several editorial boards, and on the Board of Directors at Home Savings Bank.
Teaching and research interests include sustainable approaches to strategy, design and improvement of complex systems, health care, profit, education, small businesses, government and non-government, value, resilience, agility, brand, market share and position, response time, quality, productivity, customer and stakeholder satisfaction, quality in work life, environmental management, creativity and innovation, strategic breakthrough, new product and service development, system-wide performance management, quality function deployment, employee involvement and empowerment, policy management and deployment, cross-functional management, learning organizations, benchmarking, structure and organization for performance management, and service management.

Text, Readings and Schedule
This course will use the text:
Finster, Mark P., 2012. Sustainable Approaches to System Improvement.

Each chapter and a companion power point presentation will be available weekly for electronic download from the course website at Learn@UW.

Schedule
The table describes the schedule and reading assignments. The schedule and material will be adjusted to reflect the interests of the class.

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<tr>
<th>Weeks</th>
<th>Topics</th>
<th>Chapter Assignment</th>
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<tr>
<td>1 - 2</td>
<td>Evolution of management, management archetypes, first second, third and fourth generation approaches to improvement</td>
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<tr>
<td>2 - 5</td>
<td>Fifth generation management and sustainability, organizational risks and opportunities; economic, political and scientific pressures for sustainability; sustainability concepts, definitions and metrics; challenges and opportunities related to resource limitations and concentration buildup, inverse innovation at the base of the pyramid</td>
<td>2</td>
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<td>5 - 6</td>
<td>Key concepts: Long term thinking, flow management, customer and stakeholder value creation, continual improvement, inclusion, empowerment and involvement, system thinking and sustainability, organizing for change, knowledge management, learning systems and the scientific method, study of variation</td>
<td>3</td>
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<td>7 - 8</td>
<td>Improvement projects, approaches and processes; accelerated improvement, six sigma, reengineering, phased improvement, complex system improvement, green building design</td>
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<tr>
<td>9</td>
<td>Selecting issues for improvement, green purchasing, team processes and networks, teamwork, tools for involvement, consensus building and group decision making, discounting, appreciative inquiry, stages of team growth, case: sustainable development in Africa</td>
<td>5</td>
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<td>10 - 11</td>
<td>Objective formulation: contextual analysis - strategic, environmental &amp; system considerations, metrics, critical stakeholders, outputs, processes and boundaries, market and customer analysis: understanding customer and stakeholder perspectives, prioritizing customer and stakeholder segments &amp; their needs, methods for understanding wants and needs such as purpose &amp; use analysis, interviews, focus groups, surveys, motivational &amp; promotional plans, quantification of benefits, mission statements &amp; charters, forcefield analysis</td>
<td>6</td>
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<td>12 - 13</td>
<td>Finding system leverage, manipulation &amp; consensus points; systems analysis: communication and sociological approaches, social networks, stratification approaches, Pareto analysis, double stratification, energy and construction analysis, flow and structure approaches (reengineering); theory of constraints and bottleneck analysis, cost value approaches such as activity based accounting, cost of poor quality and value engineering; systems schools of thought, data collection, aggregating, structuring, sharing and synthesizing causal relationships data-based cause and effect analysis, experimentation</td>
<td>7</td>
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<td>14 - 15</td>
<td>Systems analysis: sustainability approaches, visioning, The Natural Step, substitution and dematerialization, design of consumable/ degradable outputs, supply chains and customer chains, mechanical versus biological organizational models, natural and technical cycle design, industrial symbiosis, closed loop and open loop systems, biomimicry, designing services versus products, integration into uniquely local environments</td>
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Grades
Three activities determine course grades.

- Weekly homework: 50%
- Application papers: 40%
- Class participation: 10%

The course web page at Learn@UW provides weekly homework that address topics covered during the week. Retrieve these from the web site and return via email to mfinster@wisc.edu.

Submit application papers at the end of the sixth and 14th weeks. An application paper may address any topic of interest to the student as long as it connects to course material. It may or may not involve an organization, a project, web research, or readings of a course topic in greater depth. It may be an individual or a group effort. Each paper has a limit of six SINGLE-SPACED pages of written text. Charts, graphs, tables and images do not count as text.

Class participation includes attendance. After two absences, one percent per absence will be subtracted from the student’s final grade.

Teams
At your option, you may work in teams when writing your application papers. Teams and team members may change from one paper to the next. Submit six pages of text per team member. So a team of two will submit about 12 pages of written text. Graphs, charts, tables and images do not count as text.

Electronic Devices
School of Business policy prevents use of electronic devices during class. If you have a special need for an electronic device, please contact the professor.

References
There are both required readings from the text and background references to support optional readings. The text provides a bibliography for further background readings.

Optional readings provide more detailed information that supplements course material. Many of these articles may be downloaded from the course web site at Learn@UW.

Background references include

**On Sustainability**


Diamond, Jared, 2008. *What’s your consumption factor?*


Everard, Dr Mark, Dr Caroline Gervais and Dr Conor Linstead, 2002. Towards the sustainable use of material resources: An evaluation using the natural step framework, *The Natural Step, June*.


ISO 14001 Environmental Management System Self Assessment Checklist


McDonough, William, Michael Braungart, Paul T. Anastas and Julie B. Zimmerman, 2003. Applying the principles of green engineering to cradle to cradle design, Environmental Science and Technology, December.
Salazar, Dennis, 2008. Sustainable Packaging, the Housewares Show, the 5 Stages of Grief


**On Improvement Approaches**


