BUS-X-573
Sustainable Operations
Spring 2010

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Course Text

- Course pack with cases and readings available from bookstore.

Course Description

There is increasing pressure on businesses to pay more attention to the environmental and resource consequences of the raw materials they source, processes they deploy, and products and services they offer. Communities are demanding higher standards of air, water, and soil quality. Global warming is constantly on the news. European, Chinese, Japanese, and American legislation on product take-back and e-waste also create challenges and possible opportunities for manufacturers. Successful and visionary firms understand the need to focus on the triple bottom line of sustainability: profit, people and planet. Operations is at the core to any sustainable enterprise. This course addresses sustainable operations in three modules. In the first module, we examine improvements on the environmental impact of current operations (eco-efficiency): environmental and take-back legislation, certifications (e.g., LEED), pollution prevention and waste reduction (including lean), 3R (reduce, reuse and recycle), environmental management systems (ISO 14000), and life cycle assessment. In the second module, we examine sustainable operations strategies, particularly sustainability in the supply chain, and environmental product differentiation. Finally, the third module addresses closed-loop systems (product stewardship), which is the ultimate goal of sustainability: design for environment (DFE), leasing, reuse and remanufacturing.

Class Procedure

Sustainability is not a "mature" discipline (as, say, supply chain management), and therefore there are really no textbooks. Although there are some frameworks (which we will cover in class), we make extensive use of "best practices" by leading companies that are focused on maximizing the triple bottom line (3P: profit, people, and planet). As a result, the class will rely significantly on cases, although there will be lectures. It is *imperative* that you read the case and/or reading assigned for the day, and prepare

for the discussion using the questions that are assigned at the end of the syllabus. There is no need to turn in a written report with the answers to these questions (except for the written report of a single case, see below), but you should be prepared to answer them in class. Given the large number of cases, your participation grade is 30% of your total grade, and I will be calling on students regularly.

Deliverables and Grading

There will be three primary deliverables for this class, all of them to be done in teams of 3 students. Students should form their own teams, and inform me of the team composition by the end of week 1. If you don't have a team by the end of week 1, please let me know and I will assign you a team.

The first deliverable is a write-up of the "Wal-Mart's Sustainability Strategy" case. Please answer the questions assigned to the case at the end of this syllabus. The write-up should have a maximum of 1,200 words plus exhibits. Please use double spacing, 12-point font.

The second and third deliverables are related. One is your written project report (see more detail below), and the other is a 15-min PowerPoint presentation related to your project. The group project will showcase your learning in the course, and will provide an opportunity to "customize" the course to your own interests and needs. Each team should pick a specific firm, and provide a briefing regarding the firm's current actions and opportunities in sustainability. A good guideline for such a briefing would be a full-fledged (i.e., several pages) Business Week or Fortune article. You could pick a moderate to large firm in any industry, say at least $25 million in annual revenue, and use the library and the Web for information. For larger firms, focusing on a single line of business should help you to focus your report. Alternatively, you could pick another firm of any size whose specific strategy involves an aspect of sustainable operations discussed in class, for example, a recycling firm, a remanufacturing firm, a collector, a clean energy firm.

The written project report is to be a maximum of 2,500 words (again, please use double-spaced pages, 12-point font), plus any exhibits. You will find that the report length is not your main challenge—the main challenge is to write a thoughtful, insightful report on existing practices and opportunities in sustainability. Issues that need to be addressed in the group's presentation and report include:

- Which aspects of sustainability should most concern the managers of this firm?
- How are they dealing with these (and what has been right or wrong) relative to competitors?
- What are the strengths and weaknesses of the chosen managerial philosophy, approach or systems?
- How might the firm improve its implementation of sustainable development over the short- and long-term?
- Comment on certification: ISO, LEED, etc., if and how the firm is impacted by take-back legislation, if the firm uses LCA in their products.

I will also judge your report on how you relate to class concepts, including using the appropriate terminology used in class. You will present the highlights of your project to class, in a 15-minute

presentation, including questions (so, that means, a 12 minute presentation, 2 minutes for questions, and 1 minute for transition between teams).

Deadlines:

- Copy of case report: 4/21
- Copy of PowerPoint presentation emailed to me: 5/3 before class
- Written project report (hard copy AND electronic submission): 5/5

Composition of Grading:

- Class participation: 30%
- Case write-up: 20%
- Presentation: 20%
- Project write-up: 30%

Regarding class participation, I consider meaningful contributions to class discussion to include any comments, questions, or analyses which *advance the general class understanding* of the case, concept or issue, the major problems, key factors to consider, and appropriate decisions or plans of action that could be undertaken. I reward contributions that start us off productively, shape our discussion usefully, help us change direction when needed, provoke useful debate, and summarize the comments of others. I try to ignore repetition of other students' comments and basic facts of the case (unless specifically requested). Both quantity, and more importantly, quality are important. Keep in mind, however, that I cannot judge quality without some quantity as well.

Academic Integrity Code and Special Needs

Each assignment (case and course project) should present the statement "I have neither given nor received unauthorized aid on this deliverable," along with the signature of all the students in the team.

Any student with special needs should bring this to the attention of the instructor as soon as possible, but not later than the second week of class.

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Schedule: BUS-X-573

Nr	Date	Topic	Readings
1	3/22	- Introduction	Lecture: Introduction_sustainability.pptx
Part I: Eco-efficiency			
2	3/24	- Environmental and take-back legislation	Lecture: Environmental_legislation.pptx -Case: The European Recycling Platform: Promoting Competition in E-Waste Recycling
3	3/29	- Lean management - Pollution prevention and waste reduction	Lecture: Lean_management.pptx - Case: Wausau Equipment Company: A Lean Journey (A) - Mini-case: Nike: Moving Down the Sustainability Track Through Chemical Substitution and Waste Reduction
4	3/31	- Environmental management systems (EMS); ISO 14000	Lecture: EMS_ISO14000_LEED.pptx - Case: Benziger Family Winery: EMS Development and Implementation
5	4/5	- Certifications: LEED - Life Cycle Assessment (LCA)	- Case: Genzyme Center (A) Lecture: Life_cycle_assessment.pptx - Smith, V., G. Keoleian. 2004. The Value of Remanufactured Engines. Journal of Industrial Ecology 8(1), 193-221.
Part II: Eco-effectiveness: closing the loop			
6	4/7	- Product and market development	Lecture: Leasing.pptx - Case: Interface's Evergreen Service Agreement
7	4/12	- Design for environment - Cradle-to-cradle design	Lecture: Design_for_environment.pptx Case: Cradle-to-Cradle Design at Herman Miller: Moving Toward Environmental Sustainability
8	4/14	- Remanufacturing	Lecture: Remanufacturing.pptx - Souza, G. 2008. Remanufacturing in Closed-Loop Supply Chains. *Production and Inventory Management Journal* 45(1), 56-65.
9	4/19	- Recycling and Reuse	- Case: The ReUse People: Turning Scrap into Sales
Part III: Building a Sustainable Operations Strategy			
10	4/21	- Sustainability in the supply chain I	- Case: Walmart's Sustainability Strategy
11	4/26	- Sustainability in the supply chain II - Environmental product differentiation	- Case: Nestle's Nescafe Partners's Blend: The Fairtrade Decision (A)
12	4/28	- Building a sustainable operations strategy in a developing country	- Case: Empowering the Bottom of the Pyramid via Product Stewardship: Tetra Pak Entrepreneurial Networks in Brazil - Case: Wal-Mart China: Sustainable Operations Strategy
13	5/3	Group presentations / TBA	

14	5/5	Group presentations	Final project report due

Case Assignment Questions:

Case: The European Recycling Platform: Promoting Competition in E-Waste Recycling

1. What were the deficiencies of the national consortium model for recycling, such as the Green Dot System?
2. What were the driving values of the ERP model? In what ways did they address the deficiencies of the national consortium / Green Dot model?
3. Should ERP expand its scope?

Case: Wausau Equipment Company: A Lean Journey (A)

1. From an operations management perspective, what exactly is lean manufacturing? What does it accomplish? What is different and what is similar in lean to six sigma and total quality management? What are the main "tools" of lean manufacturing?
2. Why was Wausau's corporate culture at odds with the lean philosophy? Why would you expect significant resistance from managers and employees?
3. Why is lean manufacturing a step towards sustainability?
4. Do you believe lean can be implemented in services? Why or why not?

Case: Benziger Family Winery: EMS Development and Implementation

1. In general, what are the costs and benefits of developing an EMS? How would the costs and benefits differ if the EMS is ISO 14001 certified?
2. Did it make sense for Benziger to develop a formal EMS at all, let alone one that might be ISO14001 certified? Explain.
3. What are the potential benefits to Benziger Family Winery of ISO 14001 certification? Should Benziger pursue ISO14001 certification? If so, how soon?
4. What are the major EMS implementation issues at this point for Benziger? What should be the next steps in implementing the EMS?

Case: Genzyme Center (A)

1. What are the main components of a LEED certification, that is, what does it take to have a building LEED certified?
2. Should Genzyme go for the Platinum LEED certification? Why or why not?
3. If Genzyme decides to go for the Platinum LEED certification, which aspects of the project should it prioritize to achieve the necessary 52 points? Should it aim for more than 52 points? Why or why not?

Case: Interface's Evergreen Services Agreement

1. What is rationale for "licensing products of service"? What are the organizational requirements to support such an offer?
2. What is Anderson's vision for the Evergreen Services Agreement? What is your assessment of the business model? Why are potential customers interested by this proposal?
3. Why is Interface finding it difficult to sell Evergreen Services Agreements? What is your assessment of the negotiations with University of Texas at Houston? Why did they break down? Under what circumstances might they succeed?
4. What do you think Hendrix should do?

Case: Cradle-to-Cradle Design at Herman Miller: Moving Toward Environmental Sustainability

1. Do you think Herman Miller should use PVC or TPU in the Mirra Chair arm pad?
2. Why is the PVC vs. TPU decision so difficult for the company to resolve?
3. What are the elements of C2C? How does C2C differ from traditional business approaches to environmental issues?
4. What process and organizational changes did Herman Miller make to implement C2C? What resources were required?

Case: The ReUse People: Turning Scrap into Sales

1. Should TRP expand by hiring its own deconstruction crews and operating its own warehouses, or should it train and certify other demolition contractors and become the leading authority on deconstruction? What differences are there, both from TRP's perspective and from their customers' perspective?
2. Looking at TRP's financial statements, what are the most significant challenges you see to their day-to-day operations? How about for their expansion plans?
3. If you were in Ted Reiff's situation, what else would you be concerned about?

Case: Nestle's Nescafe Partners' Blend: The Fairtrade Decision (A)

1. Is Fairtrade an attractive segment for Nescafé and Nestlé as a whole? Why or why not?
2. If you were Nestlé's Chief Executive Officer (CEO), would you launch the product line? If so, would you launch it with or without the Fairtrade mark?

Case: Wal-Mart China: Sustainable Operations Strategy

1. Why do customers patronize Wal-Mart China stores? What does sustainability mean to them and how important is it?
2. How should sustainability be incorporated in vendor selection and evaluation? How could vendors be encouraged to participate in Wal-Mart China's sustainability initiatives?
3. What are the distinguishing features of Wal-Mart China's distribution system? How does it achieve relatively high availability with similar levels of stock (weeks' cover) to other companies??

4. How can Wal-Mart improve sustainability in its distribution and retail operations (consider "reduce, reuse and recycle," as well as innovation)?
5. How should Wal-Mart China relate to the government and employees in advancing sustainability?

Case: Empowering the Bottom of the Pyramid via Product Stewardship: Tetra Pak Entrepreneurial Networks in Brazil

1. Explain how TetraPak's efforts in Brazil towards improving recycling of their aseptic package is sustainable in each of the 3P's of sustainability: profit, people, planet.
2. What is meant in the title of the case by "empowering the bottom of the pyramid"?
3. Why does such a recycling program work so well in a country such as Brazil? Why are recycling rates for aseptic package so much higher (25%) than worldwide averages (15%)? Can its success be replicated in a country such as the United States?

<u>Assignment Case: Wal-Mart's Sustainability Strategy</u>. Your team write-up should directly answer the following questions. No need to provide an introduction or executive summary.

1. Given the fact that Wal-Mart's customers generally are unwilling to pay a premium for environmentally friendly products, how is the company deriving business value from its sustainability strategy, or, if not, how can it ensure that it does?
2. Imagine that you are Andy Reuben or Tyler Elm, evaluating the progress of the electronics, seafood, and textiles networks. Which networks have been most successful? What factors explain the successes (or lack of successes) of these networks?
3. How is Wal-Mart motivating its suppliers to share information about and continuously reduce the environmental impacts of products and processes? How can the company stimulate the development of breakthrough innovations?
4. Propose one new "game changer" or "innovation project" not described in the case (or in the Wal-Mart China case), for any of the networks. To support your proposal, outline the environmental benefits, the profit opportunity for Wal-Mart, the greatest challenges to implementation, and how Wal-Mart could overcome them. Please be prepared to present your project in 2 minutes to the class (please email me *<u>a single ppt slide</u>* of your project before class).
5. As evidenced in Exhibit 12, Wal-Mart's sustainability strategy has generally been very profitable. However, two initiatives described in the case benefit the society and the environment, but apparently decrease Wal-Mart's profits. Identify those two initiatives, and imagine that you are their internal champion. How would you justify pursuing those initiatives?