ISM 80C: Homework #3 (mostly review for Midterm)
Due on Thursday, 7 May 2009 (also see note below)

Midterm Exam: Tuesday 5 May 2009, 12 Noon – 1:30 PM (90 minutes)

Note “Incentive” for early homework completion: If you turn in a properly structured and executed homework set on Tuesday, May 5 at the start of the Midterm, you can earn up to 10 bonus points on the Midterm. The number of bonus points you receive is proportional to your score on this homework.

Reading: (1) “Five Forces/Competitive Strategy” handout and “Economic/Financial Analysis of Product Development” handout; (2) Startup, Chapters 2-6.

Problems:
1. Conceptual Product Design for a robotic vacuum cleaner (estimated time: 2 hours)
   • Describe a step-wise (i.e., Step 1. ...; Step 2. ...; etc.) procedure for designing a product concept starting from customer needs all the way to a feasible concept.
   • Apply this approach to develop 1-2 feasible concepts for an indoor mobile robot that could be used for cleaning/vacuuming floors and carpets.
   • Draw specific conclusions regarding your robotic vacuum cleaner product concepts, as well as general conclusions about what you personally learned from performing this problem.

2. Market Strategy for the robotic cleaner (estimated time: 2 hours)
   • Describe a step-wise approach for (a) sizing market for any product (in the USA in 2007), i.e., estimating the total market size (units sold and revenue), the % growth of the market, and the market share (revenue and %) of the major players.
   • Apply this approach to the conventional vacuum cleaner market and to the robotic vacuum cleaner market.
   • Draw specific conclusions about the vacuum cleaner market, and general conclusions about the execution of your stepwise approach.
   • How would you segment the vacuum cleaner market (units, revenue, % growth) using an appropriate matrix? Estimate the revenue in each segment (or element) of the matrix. If you are a new player, which of these segments would you target, and why?
   • How would you design the “marketing mix” for the new robotic vacuum cleaner designed in Problem 1: product (a clear definition of the customer needs that the specific product will satisfy as well as how the product is differentiated from other products), placement (how you plan to distribute/sell the product), promotion (advertising, PR, sales promotion, etc.), and price.

3. Business/Competitive Strategy for the mobile robot. (estimated time: 1 hour)
   Follow the same process as in Problems 1 and 2 to develop a business strategy for the robotic cleaner product concept developed in Problem 1: first describe (step-wise) the general approach for developing the business strategy for a generic product, then apply this approach to the robot cleaner, and then draw conclusions.

4. Financial Analysis. (estimated time: 30 minutes)
   Describe the general approach for developing a financial analysis for a product. What is the fundamental financial principle that governs investments and cash flows?