ISM 105/205, MOT I, Homework 7: Product Platform Strategy and Economic Analysis of Product Development

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Reading: “Apple/Intel Product Platform” class handout; U&E, PDD, 4th Edition, Chapters 8 (Testing), 12 (Prototyping), 9 (Product Architecture), and 15 (Product Development Economics); (ISM 205 students should also read the chapter on “Robust Design” in the U&E text.)

Homework Problems (Due Thursday, 2 December 2010):

The following guidelines apply: (1) create/implement an overall plan/schedule; (2) use the structured problem-solving approach on each problem. Also, explain everything you do.

1. Intel and Apple Product Platform and Product Lines
Read the class handout on Apple’s and Intel’s product platform and product lines. Create an appropriate table or diagram (or both) to summarize Apple and Intel’s product platform/product line strategy, or lack thereof. Fill your table with the appropriate information regarding Apple and Intel. Draw relevant conclusions about each company’s product (platform) strategy. Relate/connect your present analysis of Intel’s product (platform) strategy to previous analyses of Intel (performed in earlier homework sets). If you were in-charge of Apple’s product strategy during the time-period 1976-1999, what would you do differently?

2. Product Platform/Product Line Strategy for an indoor mobile robot (continued from Homework # 6, Problem # 2)
Develop a simple product platform and product lines based on a well-defined (and product-specific) product (platform) strategy for the indoor mobile robot designed in the previous homework set. This mobile robot should be capable of performing moving indoors, climbing stairs, and performing useful tasks like cleaning.

3. Financial Modeling for Technology Development (NPV Analysis):
Using Excel, first setup and then reproduce the “base-case” financial analysis in the “Product Development Economics” chapter of the text. Then do the following:

• Perform sensitivity analyses with respect to development cost, development time, unit manufacturing cost, and sales volume.
• Provide at least one specific trade-off law, e.g., tradeoff between development cost and NPV.
• If manufacturing cost increases to $500/unit, what sales volume would be required to yield the same NPV? What actions would be necessary to increase the sales volume?

4. Project Management at Cisco:
Read and/or watch the Cisco Project Management presentation by Jose Solorio, Ben Rus, and Alireza Ataei (ISM 101, Fall 2010 website). Then answer the following questions (your answers must be presented in a properly designed/structured table):

• What are the two main project management methodologies used at Cisco? Briefly describe each methodology, including the pros and cons for each, and also indicate the type of projects for which each method is best suited.
• Relate these two methodologies to the project management and prototyping methods discussed in class and in the U&E text.

5. (ISM 205 only) Robust Design, Design of Experiments:
Complete the analysis of the Chemical Vapor Deposition problem that was developed in the lecture. Carefully set up the problem, define the quality measure, etc. What are the optimum experimental settings for minimizing number of defects?
Project Phase III (due Tuesday, November 23):
• Read the instructions for the Final Report given below. This should help you in the preparation of the Phase III report, as well as in making the task of creating the final report more efficient.
• Develop a comprehensive project plan (Activities Matrix, GANTT, PERT, CPM) for the remaining weeks of your project. The major remaining activities are: product platform/line strategy, economic/financial analysis, failure modes and effects analysis, and (for ISM 205) robust design. (In addition, you may choose to include some supporting “pieces” such as a prototyping strategy, concurrent engineering, design for manufacturability and producibility.)
• Implement your plan for Phase III, which should also include any backlog (e.g., conceptual design) from Phase II. The Phase III Project Report is due on Tuesday, November 23, and the Final Project Report is due either on Thursday, December 2, or on Thursday, December 9 (by 5 PM).
• Meet with and provide the instructor with a comprehensive project update (including a table showing all work done up to the present, and clearly indicating each individual team member’s contributions, as well as proposed future work) on Tuesday, 11/23.

Project Presentation: Each group will make a very short 5-6 minute presentation (using no more than 6 slides, including title slide) of their project on Tuesday, November 30.

Final Project Report: The completed project report is due either on Thursday, December 2, or (if you need more time) Thursday, December 9 (by 5 PM). To this end perform the following:
• Create a clear, well-structured, and well-written “end-to-end” complete and correct project report that could be understood, used, and/or implemented by a third-party (e.g., a senior management review group, another project group, an UCSC SOE awards committee, business plan competition committee). Make sure to name your company and your product.
• Include a Table of Contents.
• The report should be broken up into numbered sections with captions (e.g., Section 3.5: House of Quality…..).
• The front-end of the report should have two components. First, create a useful 1-page executive summary. Then, create a 3-5 page cross-referenced description (of the actual contents of the report) which includes (1) a “function-structure” diagram for the report, showing how all the parts (e.g., competitive landscape, HOQ, conceptual design) are connected to each other, and (2) a paragraph (or two) which references this function structure to explain “how the report should be used”.
• The different sections of the report should have brief but clear explanations of the work done, with all figures and tables clearly cross-referenced to the text. Each section should have a clear set of conclusions.
• The sections of the report should be connected to each other to tell a coherent story.
• End the report with an overall set of conclusions and guidelines, and with a detailed statement of the next steps (or future work).