

FINAL
BA 290N-2, ME290P-1, INFOSYS 290P-4 and DSID125
Managing the New Product Development Process: Design Theory and Methods
Professors Alice M. Agogino, Sara Beckman and Leslie Speer
Fall 2007

GENERAL INFORMATION

Faculty:

Alice M. Agogino, Department of Mechanical Engineering, 5136 Etcheverry Hall, (510) 642-6450,
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Teaching Assistants:

Jonathan (Jono) Hey, Mechanical Engineering and the Berkeley Institute of Design, jono@berkeley.edu,
(510) 499 2628

Class Meetings and Office Hours:

MW, 9:30 - 11:00 a.m., 220 Cheit Hall

Office Hours (Beckman): M 12:30 – 2:00 p.m. or by appointment, F575 Haas School of Business

Office Hours (Agogino): W 12:30-1:30 p.m., F549 Haas School; W 2:00-4:00 p.m. 5136 Etcheverry Hall, or by appointment

Office hours (Speer): MW 12:30-3:00 p.m. in Art 231 or by appointment

Course Objectives:

This course is part of the Management of Technology program at the University of California, Berkeley. It is considered an operationally focused course, as it aims to develop the interdisciplinary skills required for successful product development in today's competitive marketplace. Engineering, iSchool and Business students from Berkeley and Industrial Design students from San Jose State University (SJSU) join forces on small product development teams to step through the new product development process in detail, learning about the available tools and techniques to execute each process step along the way. Each student brings his or her own disciplinary perspective to the team effort, and must learn to synthesize that perspective with those of the other students in the group to develop a sound, marketable product. Students can expect to depart the semester understanding new product development processes as well as useful tools, techniques and organizational structures that support new product development practice. Although the course focuses on the application of these principles to new product development, they are more broadly applicable to innovation in general – of products, services, organizations, business strategies and governmental policies.

Expectations:

This is a three-unit graduate course. Accordingly, we have designed the course to demand approximately 12 hours per week of your time. We expect that each student will prepare for and attend all of the class sessions and will participate fully on a project team. This is particularly critical, as a number of the class sessions are “labs” during which we expect you to work with your team on your development project. We have tried to smooth the workload for the course so that it will remain relatively constant throughout the semester, and all requirements are clearly spelled out in this syllabus so that you can readily plan ahead.

Academic Integrity:

We encourage full group and class collaboration on all aspects of this course. It is almost impossible to share too much information in product development. We do expect that all team members will contribute substantially to the project efforts, although some students will choose to devote themselves to the projects

beyond what is required for the course. Students will be asked to critique and contribute to the development projects of others in the class in a cooperative, supportive environment, and will be asked to submit critiques of their own group and group members during the course of the semester.

Reading Materials:

The primary reading material for the class is the textbook Product Design and Development (Fourth Edition) written by Karl Ulrich and Steve Eppinger. This book is a very basic text that provides a step by step view of how new product development processes are to be conducted. It is essential for the course, as it provides explicit instructions for each step of the process that your team will complete. (The Fourth Edition has just been released. We will let you know what changes have been made since the Third Edition in case you wish to get a used book.) Supplemental required course reading materials are available from a combination of Study.Net (www.study.net) and the course website (<https://bspace.berkeley.edu/>). On Study.Net, look for the course titled University of California, Berkeley -- MBA 290N-1: Managing the New Product Development Process (Fall 2007).

Grading:

Your course grade will be determined as follows:

- 20% on the quality of your preparation for and participation in class discussions
- 20% on the quality of your individual assignment solutions
- 10% for your final design journal and individual lessons learned
- 30% on the quality of your team's work on project-related assignments and deliverables
- 20% on the quality of your team's final project presentation and deliverables

During the semester, we will periodically ask for individual assessments of the contributions made by members of your team to the team project. These assessments will not be considered in preparing your final team grade.

Class Preparation and Participation:

Reading assignments and questions to guide your thinking about these assignments are given in the class schedule for each class session. We expect you to come to class prepared to discuss the readings and the suggested questions. In any given class session, a handful of students may be called upon specifically to speak to the readings and questions about them. If you have prepared according to the syllabus, you will have no problem responding when called upon. Your individual class participation grade will be based upon your in-class remarks during discussions and will be judged by the faculty.

Individual Assignments:

We have periodically assigned individual exercises to have you play around with some of the concepts we are teaching. The syllabus makes clear which of these are to be turned in. The others are intended simply to prepare you for class discussion.

ALL INDIVIDUAL ASSIGNMENTS ARE TO BE SUBMITTED VIA THE bSPACE ASSIGNMENTS TAB UNDER THE APPROPRIATE HEADING PRIOR TO THE START OF CLASS ON THE DAY THEY ARE DUE. ALWAYS BRING ONE COPY OF YOUR HOMEWORK TO CLASS, AS WE WILL FREQUENTLY ASK YOU TO SHARE YOUR RESULTS.

Website Use:

We will make extensive use of the course Web site to both communicate information to you and to converse with you about your homework and your projects. You will find the course listed on <http://bspace.berkeley.edu/>. Once you have formed your project groups, we will set up group pages on which we expect you to store your working documents for your project. The faculty will review the group pages regularly to provide feedback on your work. We will use bSpace rather than Catalyst (the MBA system) as Catalyst does not support group projects, nor does it allow access to non-Berkeley students. bSpace is a far more flexible system for our purposes.

PROJECT BACKGROUND AND GENERAL INFORMATION

New Product Development Project:

The goal of this exercise is to learn principles and methodologies of product development in a realistic context. Most product development professionals work under tremendous time pressure and do not have an opportunity to reflect on the development process. In this course, the stress level will be low enough to allow time to experiment and learn. You will be asked to form project teams of 4 to 6 students, including a mix of Engineering, Business and iSchool students from UCB and Industrial Design students from SJSU. You will have opportunities during the first two weeks of class to scope out the possible projects and get to know potential teammates.

PROJECT BACKGROUND

Your challenge in the project portion of this course is to design a new product (a physical product, piece of software or service), test it on a consumer group, and produce an early prototype version of it. The goal of this exercise is to learn principles and methodologies of product development in a realistic context.

Guidelines for successful projects are as follows:

- There should be a demonstrable market for your product. One good way to verify a market need is to perform a competitive review and identify existing products that try to meet the need. Your product need not be a variant of an existing product, but the market need addressed by your product should be clearly evident. The product does not have to have a tremendous economic potential, but should at least be an attractive opportunity for a small firm.
- If you choose a physical hardware product (rather than a software user interface design or service), the product should have a high likelihood of containing fewer than 10 parts. Although you cannot anticipate the design details, it is easy to anticipate that an electric drill will have more than 10 parts and a garlic press fewer than 10.
- You should be confident of being able to build a reasonable prototype of the product. If you choose to make a hardware product, you must have access to prototyping capabilities such as machining processes and the skill sets to run them. In some cases a combination of a non-functioning “appearance” type model and a rough mechanical or electrical “working” prototype may be acceptable.
 - Your SJSU team member should have access to shop facilities and, in many cases, has his or her own equipment.
 - If a UCB member of your team is interested in using the UCB Mechanical Engineering student shop, you need to go through safety training in the early part of the semester. Gordon Long is the Senior Lab Mechanician in charge of the student machine shop. You will need to visit him in 1166 Etchevery Hall or call him at 642-3314 to make an appointment. The qualification training is for education and safety purposes. It consists of three 1-hour sessions and a final 1-2 hour session on an actual hands-on application.
 - For insurance and liability reasons, UCB students are not allowed to use the shop facilities at SJSU and the SJSU students are not allowed to use the shop facilities at UCB.
 - For software user interface products, you should have access to proficiency in Web design tools or other software prototyping tools.
- The product should require no basic technological breakthroughs. We do not have time to deal with large technological uncertainties. In fact, we are more concerned that you have a specific market need in mind for your project than that you attempt to develop new technologies.
- You should have access to more than five potential users of the product (more than 20 would be nice.) You will need to talk with them or observe them when you launch your product and visit them with your product mock-ups or prototypes.
- Save any highly proprietary ideas for another context, as we will be open in discussing the projects in class and do not wish to be constrained by proprietary information.
- The most successful projects tend to have at least one team member with strong personal interest in the target market.
- Most products are really not very well designed. (See, for example, the badly designed products documented at www.baddesigns.com.) Thus, if you pick almost any product that satisfies the general guidelines in this list, you will likely be able to develop a product that is superior to everything currently on the market.

Projects adhering to these guidelines will have the greatest probability of success.

PROJECT ASSIGNMENTS

Project assignments are intended to pace the development process for your product. There is virtually no slack in this schedule and so assignments must be completed on or before the scheduled due date in order to maintain the project schedule. All project assignments are clearly spelled out in the class syllabus. There are two types of assignments: review assignments that suggest that you complete certain deliverables by certain lab dates and formal project deliverables that are due at peer reviews. Please post the items to be reviewed on bSpace and have them available for us to review at the labs.

All project deliverables (except the project proposal and the sketchbook/journal) are to be completed as a team. Please deliver all assignments according to the following format:

- Submit all project assignments and deliverables electronically. Unlike individual assignments that are to be submitted through the assignments tab on bSpace on the due date for the assignment, Project Assignments and Deliverables should be posted to *your group's page* on the class Web site where they will be visible to all members of your group as well as all faculty members (and coaches if you choose to include them on your site).
- Maintain a history of your project deliverables on your group Web site so that the faculty can review your progress over time, not just your most recent output. You should save formal project deliverables as well as interim documents on the site.
- Be concise. We like assignments that are 2-5 pages in length when possible. The exception to this guideline is concept sketches where one concept per page is preferred.
- **With each project deliverable, please provide a short (less than one page) description of the process your group adopted in completing the assignment and reflections on its effectiveness.** You should also comment on any lessons learned related to team dynamics or project management. (Individuals may choose to print copies of these reflections to include in their journals.)
- Please develop a naming scheme for the things you post to your group website that makes obvious what those things are. In particular, you should name the links to the files that are intended for faculty review by using as the first word of the name the letters DEL (short for deliverable). Follow DEL with an indication of what the document is. For example, when you submit your mission statement for faculty review, name the link DELmissionstmt.

Journal

Each individual in the class is **required** to maintain a design journal throughout the semester, to be turned in at the final project presentation, Friday, December 14th. It counts 10% towards your individual grade. The journal will be returned at the beginning of Spring Semester. This journal should include your individual thinking (both imagery and words) pertaining to your project. Think of it as a diary of sorts. You may sketch pictures, paste in pictures or business cards, write words, create mindmaps, or choose any other approach that works for you to capture your ideas, thoughts, and reflections about your product and your project. The journal should be used both to **capture ideas** about the product itself as you move through the process, but also to **document thoughts, reflections and insights** on the process of product development, group dynamics, project process, etc. Inventors use journals as it helps to document when they came up with an original idea (useful in the patenting process); engineers do this to work out complex technical details; and designers do this to generate lots of ideas (as ideas feed off of one another); project managers use journals as a management tool to generate "lessons learned" and "best practices" to help run future product development projects more effectively. You can tailor your journal to your own working style and your unique role within your project team. There are copies of exemplary design journals on the bSpace website if you would like to see what one might look like. Only the faculty will see these journals; no one else will see them unless you choose to share. Your design journal will count towards your individual assignments grade.

Working with Your Design Coach

We are privileged to offer you the opportunity to collaborate with some of the leading experts in product development from prominent firms in the Bay Area. Each team will be assigned a "design coach" who will mentor you throughout the product development process. The design coach is tasked with giving you a practitioner's viewpoint and advice on all aspects of your product and product development progress.

Given the coaches' many years of experience in product development and coaching design teams for this course, you will find their input invaluable.

We recommend that you contact your design coach immediately after he or she is assigned to your team. We recommend that you designate one team member as the contact person. You should plan on having at least two to three meetings with your coach. We recommend meetings at three of the major milestones: mission statement formation, synthesis of customer and user needs/concept generation, design review or first pass prototype development and assessment. Meetings are typically 60-90 minutes long. You should coordinate the meeting logistics with your coach to suit your team's schedule and your coach's availability. You should prepare an agenda for the meeting ahead of time and share the agenda with your coach. At the meeting, we suggest that you not only brief your coach on your progress to date using your deliverables, design journals, and prototypes, but also come prepared with a specific objective. For example, you might brainstorm concepts or review your prototypes. Bring lots of questions and use the coaches' time wisely. Note that this does not mean that you have to have everything completed or answered before you go. In fact, the coaches can be most helpful when you are struggling with a choice or direction.

After each meeting, your team should *submit to the group's bSpace page minutes of the meeting and a summary of key learning from the meeting*. You may wish to share this with your coach, also.

Working with Your Team

For some of you, this will be your first experience in working on a collaborative, cross-functional team. Others of you will feel that you are old hands at this. Our experience is that many of you have worked on *group* projects in the past, but not necessarily as a *team*. We hope that through this course you will learn to differentiate the two. While there is no definitive evidence that increasing the level of functional integration is truly a guarantee for enhancing the performance of new products, studies have found that 97% of companies have used cross-functional teams at one point. Thus, it is critical to understand the nature of these types of teams. Part of the learning in this course is to assess patterns of cooperation and team dynamics and to reflect on both the behavioral and organizational challenges your team faces. While teams vary from semester to semester, we find that good organizational practices always benefit the entire team. Here are a few suggestions:

1. Commit to a regular meeting time. You should also set up modes of electronic communication for when you cannot meet together. We suggest that you all set up Skype accounts that can be used to include an individual who can't be at a meeting or lab in person or for conference meetings. Be sure to structure the meetings with an agenda, a time limit, and action items for which individuals are responsible. Do a wrap up at the end of each meeting so that everyone is on the same page. This will make the meeting productive and ensure concrete action items for future meetings
2. Please use the team bSpace e-mail alias to communicate with your team. It will also archive and thread your e-mails so that you can review past conversations. Store shared documents on the group page on the website.
3. Work together, not separately. Get to know each other's strengths, e.g., who knows PowerPoint, who's the CAD guru, who's good at running meetings, who's good at eliciting feedback from customers, etc. You will find that, unlike group work, you cannot just split up the work and staple it together when you next meet. There are many decisions you must make as a team.
4. Attempt as much open communication as possible. Discuss the means by which you wish to resolve problems as a group, and what escalation process you will use if problems persist. Decide, for example, when you want to involve the faculty or your design coaches in helping you resolve problems.
5. Use your mission statement to create a shared vision among the team members that will allow you to stay focused and on target.
6. Have fun!

BA 290N-2, ME 290P-1, INFOSYS 290P-4 and DSID125
Managing the New Product Development Process: Design Theory and Methods
Class Outline and Assignment Schedule
 Professors Sara Beckman, Alice M. Agogino and Leslie Speer
 Fall 2007

DAY	DATE	TOPIC
1 M	8/27	Introduction to New Product Development (NPD) Ch. 1: Introduction Read: " The Innovation Backlash " StudyNet Reading: "The Why, What and How of Management Innovation" StudyNet Reading: "Connect and Develop: Inside Proctor & Gamble's New Model for Innovation"
2 W	8/29	Introduction to NPD: The Role of Design Ch. 10: Industrial Design Read: " No Accounting for Design " Read: " Can you measure design's value? " Read: "Innovation as a Learning Process: Embedding Design Thinking" (bSpace/Catalyst) <i>Individual Assignment Due: Bring a good or bad design to class</i>
3 M	9/3	LABOR DAY HOLIDAY
4 W	9/5	Introduction to NPD: A Design Exercise Read: "Delta Design Exercise – The Design Task" (bSpace/Catalyst) <i>Individual Assignment: Prepare to play Delta Design Exercise role</i> <i>Individual Assignment: Reflect on Delta Design experience</i>
5 M	9/10 SJSU ¹	Project: Proposal Presentation and Voting <i>Individual Assignment Due: List of 20 "bugs"</i> <i>Individual Assignment Due: Project proposal</i> <i>Project Preferences due today by 5 p.m.</i>
6 W	9/12 SJSU	Project: Organization and Launch Ch. 2: Development Processes and Organizations Read: " The Trouble with Teamwork " Guest speaker: Jane Creech, Strategic Business Systems <i>Individual Assignment Due: MBTI Personality Test Results and Cognitive Style Survey</i>
7 M	9/17	Project: Project Management Ch. 16: Managing Projects StudyNet Reading: "Innovation at the Speed of Information" <i>Individual Assignment Due: Reflect on Delta Design experience</i>
8 W	9/19	Concept Development: Customer and User Needs Assessment Ch. 4: Identifying Customer Needs StudyNet Reading: Design Research (pp. 20-80) Guest Speaker: Michael Barry, Principal, PointForward <i>Individual Assignment Due: Customer and user needs interview</i>
9 M	9/24	Concept Development: Context and Planning Ch. 3: Product Planning StudyNet Case: Linking Strategy and Innovation – Materials Technology Corp.
10 W	9/26	LAB: Mission Statement Review and Customer/User Needs Assessment Planning <i>Project Deliverables Reviewed: Mission Statement and Customer/User Needs Assessment Plan</i>
11 M	10/1 SJSU	PEER REVIEW PRESENTATION: MISSION STATEMENT AND CUSTOMER NEEDS ASSESSMENT PLAN Read: "The Critique" (bSpace/Catalyst)

¹ Note: The "SJSU" designation here means that Industrial Design students from San Jose State University will be joining us for the class at UC Berkeley.

		<i>Project Deliverable Due: Mission Statement and Customer/User Needs Assessment Plan</i>
12 W	10/3	Concept Development: Frameworks for Understanding Customer Needs StudyNet Reading: "Get Inside the Lives of Your Customers" StudyNet Reading: "Spark Innovation through Empathic Design"
13 M	10/8	Concept Development: Translating the Voice of the Customer Ch. 5: Product Specifications StudyNet Reading: "Turn Customer Input into Innovation"
14 W	10/10	Concept Development: Concept Generation Ch. 6: Concept Generation Read: " Creative Thinking Techniques "
15 M	10/15	Concept Development: Concept Selection Ch. 7: Concept Selection <i>Individual Assignment: Assessment of competitive products using concept selection matrices</i>
16 W	10/17	LAB: Concept Generation <i>Project Deliverables Reviewed: Concept Sketches</i>
17 M	10/22	Testing and Refinement: Concept Testing Overview Ch. 8: Concept Testing Ch. 12: Prototyping Tour of Etcheverry Prototyping Labs
18 W	10/24	LAB: Concept Selection and Testing Plan <i>Project Deliverable Reviewed: Concept specifications and drawings, concept testing plan</i>
19 M	10/29 SJSU	PEER REVIEW STUDIO: CONCEPT DESIGN REVIEW <i>Project Deliverables Due: Updated mission statement and customer and user needs analysis, concept generation sketches (at least three final product direction renderings) and concept selection matrices</i>
20 W	10/31	Testing and Refinement: Building Prototypes and Using Computer Aided Design Tools Ch. 13: Robust Design StudyNet Reading: "Boost your Marketing ROI with Experimental Design" StudyNet Case: Team New Zealand (A)
21 M	11/5	LAB: Finalize Financial Models and Product Testing <i>Project Deliverables Reviewed: Final product specifications and drawings</i>
22 W	11/7	DfX: Design for Manufacturing and Cost Ch. 11: Design for Manufacturing Ch. 15: Product Development Economics
23 M	11/12	VETERANS' DAY HOLIDAY
24 W	11/14	LAB: Prototype Development and Testing <i>Project Deliverables Reviewed: Early prototypes</i>
25 M	11/19	DfX: Design for Environment Read: Natural Capitalism - The Next Industrial Revolution, Chapter 1 Read: Cradle to Grave – How Products Impact Natural Systems Read: " The Cradle to Cradle Alternative " For the optional Friday lab, read: EIO-LCA Tutorial
26 W	11/21	LAB: Final Prototype Development, Testing and Refinement, Financial Analysis <i>Project Deliverables Reviewed: Financial analysis, results of product concept testing</i>
27 M	11/26	DfX: Design for Flexibility using Product Architecture Ch. 9: Product Architecture Read: Mass Customization - Who? – What Dell, Nike & Others Have in Store for You http://www.core77.com/reactor/mass_customization.html bSpace Reading: "Best Practices - Mass Customization and Build-to-Order Manufacturing"?
28 W	11/28 SJSU	PEER REVIEW STUDIO: CONCEPT PROTOTYPE AND DESIGN REVIEW TRADESHOW <i>Project Deliverables Due: Updated customer needs, concept generation sketches and renderings, concept selection matrices, product specs and drawings, "proof-of-concept" prototypes, financial analysis</i>

29 M	12/3	Supporting NPD: Intellectual Property Management Ch. 14: Patents and Intellectual Property Read: " The New Instant Companies " (http://money.cnn.com/magazines/business2/business2_archive/2005/06/01/8263450/index.htm) Guest speaker: To be confirmed
30 W	12/5	Class Summary: Other Things You Can Do With This Process bSpace Reading: "If Managers Thought Like Designers" Guest speaker: Arnold Wasserman, The Idea Factory
31 M	12/10	Class Summary: Capturing Lessons Learned StudyNet Reading: Learning from Projects – Note on Conducting a Postmortem Analysis <i>Individual Deliverable: Lessons learned</i>
Fri.	12/14 SJSU	FINAL EXAM: PRODUCT PRESENTATIONS AND JUDGING (3:00 – 6:00 P.M.) WELLS FARGO ROOM (HAAS SCHOOL OF BUSINESS) <i>Final Project Deliverables: Summary CD (see details)</i> <i>Individual Deliverables: Journal/sketchbook/diary and team evaluations</i>

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Managing the New Product Development Process: Design Theory and Methods
Detailed Class Syllabus
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Fall 2007

Required Textbook: Product Design and Development (Fourth Edition), Karl T. Ulrich and Steven P. Eppinger. In the outline below, CHAPTER X always refers to the readings from the text. The book is available from the campus bookstore, Amazon.com, and other sources. The Third Edition of the book is just fine; very few changes were made in it for the Fourth Edition.

Required Online Course Reader: Contains cases and supplemental readings. Changed slightly from last year. Course readers are available through a combination of Study.Net and the course website, bSpace. StudyNet provides all of the Harvard cases and readings. You can either order a reader to be printed and sent to you, or you can download the cases/readings as you need them and print them on your own. Students will be connected to Study.Net through Catalyst. See instructions for getting onto Study.Net at the very end of this document.

Class 1: Introduction to New Product Development (NPD)
Monday, August 27th

Read Ch. 1: Introduction

Read: "[The Innovation Backlash](#)"

(http://www.businessweek.com/innovate/content/feb2007/id20070212_728732.htm?chan=search)

Read: "The Why, What and How of Management Innovation" (StudyNet)

Read: "Connect and Develop: Inside Proctor & Gamble's New Model for Innovation" (StudyNet)

We will cover course logistics and requirements and then develop the motivation and framework for the course. Come to class prepared to discuss why new product development is such a critical process to manage and what the key activities in new product development entail.

Class 2: Introduction to NPD – The Role of Design
Wednesday, August 29th

Ch. 10: Industrial Design

Read: "[No Accounting for Design](#)" (http://www.fastcompany.com/magazine/112/open_next-essay.html)

Read: "[Can you measure design's value?](#)"

(http://www.businessweek.com/innovate/content/mar2007/id20070321_775013.htm?chan=search)

Read: "Innovation as a Learning Process: Embedding Design Thinking" (bSpace/Catalyst)

Throughout the semester, you will work closely with Industrial Design students from San Jose State University. They will bring a set of skills and perspectives to your teams that may be new to you. In this class we'll explore the topic of design, and the design process. Please come prepared to discuss the value of design to an organization and your understanding of what "design thinking" entails.

INDIVIDUAL ASSIGNMENT DUE: *Please bring to class an example of a product or packaging that represents for you good or bad design. Be prepared to discuss briefly why you feel the design is good or bad, and what the company did to achieve this. Either bring the physical object or a photograph of it to class to share with others.*

Class 3: LABOR DAY HOLIDAY
Monday, September 3rd

Class 4: Introduction to NPD – A Design Exercise

Wednesday, September 5th

Read DELTA DESIGN EXERCISE – THE DESIGN TASK and prepare the role assignment you were given. Make sure that you thoroughly understand the role you are to play. If you do not, please ask questions of your trainer to clarify your position. Prepare any materials you believe you will need to play the role. **DO NOT discuss** the other three roles with others in the class. On the day of class, come to the classroom for your room assignment, go straight to that room and convene your team as quickly as possible, as you will find that 1 1/2 hours is quite short for accomplishing this work.

Please note that the following assignment will be due on Wednesday, September 17th. You may wish to complete it while the experience is still fresh in your mind:

Comment [SLB1]: The assignment was meant to go along with this note to warn people about the assignment and get them to reflect while the experience was fresh.

Class 5: Project Proposal Presentation and Voting Monday, September 10th

INDIVIDUAL ASSIGNMENT DUE:

List of 20 “bugs”—submit to the assignment tab designated for “20 bugs” on bSpace

List of Twenty “Bugs”

We are all capable of identifying market needs and thus generating ideas for new products, in part by noticing the deficiencies in the products we use in everyday life. To prove to yourself that you can identify market needs, generate a list of at least 20 “bugs.” Designers at the product design firm IDEO use “bug lists” to record their observations of products and situations where products failed to meet the actual conditions of use. This list should include any observation or annoyance that comes to your mind. Note that we are looking for a list of “bugs” (e.g., my vegetable peeler hurts my hand when I peel potatoes) rather than a list of product solutions (e.g., a vegetable peeler with a soft handle). In other words, you don’t have to invent a solution to a problem you see – just state the problem.

INDIVIDUAL ASSIGNMENTS DUE:

Single project proposal (submit to class website by 5 p.m. on Sunday 9/9)

Project preferences (submit to class website by 5 p.m. on 9/10)

Overview

Following is the process we will use to generate the project ideas for this semester’s teams, document those ideas, present them to the class, identify individual project preferences and finally form project teams. Each student is to develop a project proposal. This proposal may be based on one of the bugs on the “bug list” or may be based on a market need that interests the student. The proposal should be based on a **market need, not on a proposed solution**. We encourage students who want to do something to benefit the local community. Last year, for example, teams worked on protective clothing for farm workers who handle pesticides, on emergency water supply providing, protection for pediatric poisoning, etc. Remember, however, that you must be able to visit members of your target customer group, observe them and interact with them.

Individual Project Proposal

Your one-page proposals should include:

- A brief, descriptive project title (2-4 words)
- Your name, phone number, e-mail, and school/department affiliation
- A description of the market opportunity you have identified. Your description may include any of the following: Documentation of the market opportunity, shortcomings of existing competitive products, and/or definition of the target market and its size. Your written descriptions should be supported by at least one photographic image.

Example:

Market Opportunity – coping with long checkout lines in grocery stores

Photograph: woman standing in line, looking very bored or impatient

- Please do not present *product ideas* at this point. Our strict focus in this phase of the course is on the *market opportunity* – the unfilled need or unsolved problem – and not on solution concepts.

Class Presentation

Come to class prepared to give a VERY SHORT (i.e., one minute), yet convincing, presentation of your project proposal. Your presentation should include:

- Your name and school/department affiliation
- A verbal and visual demonstration of the product opportunity you have described in your proposal. Given that the audience will be able to read your written proposal at their leisure (after class), you might spend your time explaining the richness of the market opportunity or demonstrating existing competitive products.
- Any special skills or assets you have (marketing expertise, access to a multimedia computer, user interface design expertise). Any special skills or assets you need to complement yours in developing this market opportunity.

Submitting Preferences

By 5 p.m. on Monday, September 10th you must decide on your project preferences. You should list the FOUR projects on which you would most like to work in order of preference. If you would like to work with a particular group of classmates, recalling that your group must contain engineering, MBA and industrial design CCA students please submit their names as well. Submit your preferences via the Web site, following instructions available there. We will process your preferences and assign teams. You will be notified of team assignments no later than Wednesday, September 12th. There is a good chance we will ask you to vote a second time after we have eliminated some of the projects in the first round, so stay tuned.

Class 6: Project Organization and Launch Wednesday, September 12th

Read Ch. 2: Development Processes and Organizations

Read: “[The Trouble with Teamwork](#)”

(<http://www.leadertoleader.org/knowledgecenter/L2L/summer2003/lencioni.html>)

Guest speaker: Jane Creech, Strategic Business Systems

During this class session, we will talk about team dynamics and interactions as being critical to new product development success. What does the paper say about using information from tests such as the Myers-Briggs test? What roles does the paper suggest that the course faculty should play in your projects? What role should your coaches play?

INDIVIDUAL ASSIGNMENT DUE: Complete the Myers-Briggs test available on the Web. (Students may use the prior results of having taken the test if available.)

- The **Jung Typology Test** and information about it are available at www.humanmetrics.com. Read the background on the test and then take and score it.
- After you have the results of your test, go to the SurveyMonkey website listed on bSpace (and Catalyst) and complete the survey there. Bring your answers to class to use in a team launch exercise.
- If you want additional information on how to interpret the results of the test, you may refer to the document “Introduction to Type in Organizations” which is available on reserve in the Haas library. You can also purchase the paper from www.mbti.com if you are interested.

Class 7: Project: Project Management Monday, September 17th

Read CHAPTER 16: MANAGING PROJECTS and INNOVATION AT THE SPEED OF INFORMATION. We’ll debrief your Delta Design exercises and introduce some basic tools for managing new product development projects. How would the tools presented in the readings have helped you in your Delta Design exercise?

Did you experience any of the feedback loops described in the *Innovation at the Speed of Information* article?

INDIVIDUAL ASSIGNMENT DUE: Write a one-page paper with your reflections on the Delta Design Exercise. What did you notice about the design process itself? What did you notice about the dynamics on your team? What would you change were you to go through the design exercise again? Place your paper in the assignment box on bSpace under "Delta Design".

Class 8: Concept Development – Customer and User Needs Assessment Wednesday, September 19th

Read CHAPTER 4: IDENTIFYING CUSTOMER NEEDS and read DESIGN RESEARCH (STUDY.NET) at in preparation for class discussion. We will have a guest speaker, Michael Barry, from the design firm PointForward (www.pointforward.com) who will talk about user needs understanding, and in particular the role of ethnographic research in understanding customer needs.

INDIVIDUAL ASSIGNMENT DUE: Choose a product that competes with or serves a similar purpose to the one your project team is developing. Interview a potential or current user of the product about what they like and dislike about the product. This interview can be done very informally in 5-10 minutes. Record what your interviewee says and interpret the data in terms of customer needs as described in Chapter 4. Pay particular attention to the guidelines provided for translating customer statements into needs statements. Prepare a one-page summary of what you have learned about the interview process. Submit both the record and interpretation of customer needs and your page of lessons learned to the drop box.

Class 9: Concept Development – Context and Planning Monday, September 24th

Read CHAPTER 3: PRODUCT PLANNING and prepare the LINKING STRATEGY AND INNOVATION -- MATERIALS TECHNOLOGY CORPORATION case for class discussion. One of the critical activities that a firm undertakes is planning its product portfolio. This plan in turn drives the definition of the individual product development projects and the firm's investment in them. In this session, we will use the Materials Technology Corporation case to explore product portfolio planning.

Materials Technology Corporation (MTC) is a start-up company in advanced materials that has been extraordinarily successful in its technology development and has devised a compelling strategy that attracted tens of millions of dollars in investment capital. The company is struggling, however, because it doesn't have a rigorous mechanism for linking its strategy to its new product development process. We'll explore the current process and develop a set of recommendations for how the company might proceed from here. (NOTE: The blank column heading in Exhibit 4 should read Estimated Total FTE Months Remaining on the Project.)

1. What is the strategic direction, i.e., business model, of MTC? Is this strategic direction consistent with its product development strategy?
2. Is the set of projects proposed by Bob Block the right set of projects for MTC? How should MTC prioritize this set of projects?
3. What was the project planning process at MTC? Was this project planning process successful for all the project types that MTC undertook?

Class 10: LAB—Mission Statement Review and Customer/User Needs Assessment Planning Wednesday, September 26th

PROJECT DELIVERABLES DUE: Submit your Mission Statement and Customer/User Needs Plan. As with all project assignments, include a short discussion of the process you used, lessons learned, and any observations you have about your team. Submit this to your group's page.

This is the first “lab” session we will have during the semester. These are times that we are setting aside for work on your product development projects. We expect that you will use this time to meet in your groups, and to interact with the faculty and/or your coaches. As the Industrial Design students are from the South Bay, and the logistics of getting teams together (physically) for all the Labs may be difficult, we ask that everyone get a free Skype account to facilitate “virtual” team meetings as needed for these labs. The following activities should be done *prior* to the lab.

Prepare a Mission Statement (as shown in chapter 3). Use this assignment to refine the definition of your project and to agree as a team about what your objectives are. We will review your Mission Statement and guide you in any refinements that we believe will lead you to a better outcome at the end of the semester.

Prepare a customer/user needs assessment plan (following the guidelines in Chapter 4) that answers the following questions: Who is your customer? How will you access your customers? What approach will you take to collecting information (e.g., interviews, observation, surveys)? What types of information will you gather? How will you document your information gathering (e.g., words, images)? Your goal is to learn new information about your customers and their needs -- information beyond your original assumptions. If you will be producing a questionnaire, include a draft with your Assessment Plan.

Class 11: PEER REVIEW PRESENTATION – MISSION STATEMENT, COMPETITIVE AND CUSTOMER/USER NEEDS ASSESSMENT PLAN
Monday, October 1st

PROJECT DELIVERABLE: Submit a digital version of your presentation your group page by 9 a.m. on 10/1. In addition, submit your hierarchical list of customer needs and the shorter list of important needs as well as your first-pass competitive analysis. If you have done a needs importance survey, submit the results of that as well. Include a short discussion of the process you used, lessons learned, and any observations you have about your team.

Your project should now have completed the following activities: Gather raw data on customer needs (through whatever means you deem most appropriate to your potential market). Generate a list of customer needs for your product and organize it hierarchically into primary, secondary and tertiary needs. Identify three or four needs that you feel are important, but latent and not addressed by current products. Create a persona or personas that represent your typical customer, or some “corner cases” who you think will cause you to think creatively about your product design. Create 10 likely use scenarios in which your customer will likely want to use your product. Note that you do not need to have designed a product yet – we are still focused on understanding customers and use environments. You do not have to have the importance survey done by now, although you should do so soon if you envision hard trade-offs among different needs.

Note that most of you will find that your Mission Statement continues to evolve throughout the product development process as you learn more about your target market and gather feedback from faculty and others. You should continue to update your Mission Statement as you gather new inputs (archiving the old ones on the Web site).

This will be the first of three peer reviews or presentations you will give on your product development project. (The second and third will be in a peer-review studio format, while the final exam will be in an internal tradeshow/group presentation format.) Plan *10 minutes MAXIMUM* for the presentation so that we can fit all projects into one class session. (We’ll split the class and conduct presentations in two rooms.)

Your presentation should cover the following: a mission statement, such as is shown in your textbook, a brief review of the means used to collect customer and user needs information, a summary of the identified customer and user needs, one of your most interesting use scenarios, a short summary of your competitive analysis and a summary of lessons learned in the process to date.

This is an opportunity to receive feedback from and give feedback to your classmates. It is also an opportunity to learn about new product development processes by observing what others have done on and learned from their projects. Come to class prepared to actively listen to your peers talk about their projects, ask them constructive questions and provide them feedback on the direction their projects are taking.

The very short paper “The Critique” was written for students at California College of the Arts to describe the critique process. Design students are accustomed to getting regular feedback on their projects -- the paper will give you a little sense as to what critiques are like.

Class 12: Concept Development – Frameworks for Understanding Customer Needs
Wednesday, October 3rd

Read GET INSIDE THE LIVES OF YOUR CUSTOMERS and SPARK INNOVATION THROUGH EMPATHIC DESIGN. Seybold describes an approach to modeling customer needs using a “customer scenario.” What are the salient elements of this method?

Class 13: Concept Development – Translating the Voice of the Customer
Monday, October 8th

Read CHAPTER 5: PRODUCT SPECIFICATIONS and TURN CUSTOMER INPUT INTO INNOVATION. Where do product specifications come from? How do specifications relate to user needs? What mechanisms can you imagine using to keep the voice of the customer alive throughout the new product development process?

Class 14: Concept Development – Concept Generation
Wednesday, October 10th

This class session will focus on brainstorming and “ideation” techniques used by new product development teams to generate product ideas from their understanding of customer wants and needs and of the available technologies. Read CHAPTER 6: CONCEPT GENERATION and CREATIVE THINKING TECHNIQUES (<http://www.virtualsalt.com/crebook2.htm>). Consider thought questions 2 and 3 at the end of Chapter 6. How do the methods of concept generation presented in these readings vary? How would you decide which to use when?

Class 15: Concept Development – Concept Selection
Monday, October 15th

Once you have generated a set of possible product concepts, you must identify the one or ones that you will actually work on. During this class session, we review methodologies for choosing from among the options. Read CHAPTER 7: CONCEPT SELECTION. The concept selection process as described in the chapter seems quite straightforward. Was it as straightforward when you applied it to actual products? What do you like and dislike about the method?

INDIVIDUAL ASSIGNMENT DUE: Chapter 7 describes concept screening and concept scoring matrices as a means of selecting among competing ideas for products you might develop. In this assignment, we ask that you apply these screening and scoring tools to assess commercially available products that address the needs you identified in your user needs analyses. Identify 3-5 products that might address the top customer needs you have identified. Prepare screening and scoring matrices to evaluate those products, identifying the best of the bunch. Is there a product that is superior to the others in meeting some of your user needs? Are there some needs that are not well satisfied by any of the products? Are there features that are good and might be used for the concepts you are considering? Submit to the assignment tab on bSpace. This is an individual exercise. However, in class we will ask you to meet with your team and compare notes. So bring a copy of your assignment to class for this class exercise. Keep a copy of your combined matrix as it could be useful as benchmarks from which to compare your new concepts.

Class 16: LAB – Concept Generation Review

Wednesday, October 17th

PROJECT DELIVERABLE DUE: Concept Sketches

A minimum of 20 concept sketches. These should be 20 different “design” solutions for a single concept direction. The generation of concepts is an important part of the product development process. The goal is to get as many ideas on the table as possible, thereby having a richer range of ideas to choose from. We recommend that each member of the group produce 10-20 concept sketches individually. The group should then review these sketches and modify, combine, or change them in order to produce a minimum of 20 concepts for this assignment. It seems like a lot, but you will be impressed by the progress on your project in a short period of time – and, all the books on innovation highlight the ability of the teams to generate a wide range of ideas.

Class 17: Testing and Refinement – Concept Testing Overview
Monday, October 22nd

Read CH. 8: CONCEPT TESTING and CH. 12 PROTOTYPING. Today, we will tour the rapid prototyping facilities in Etcheverry Hall. Please meet at the north corridor on the second floor of Etcheverry Hall. Etcheverry Hall is located on the North side of campus on Hearst Ave. just above Euclid and just below Soda Hall.

Class 18: LAB – Concept Selection and Concept Testing Plan
Wednesday, October 24th

Your team should have completed the following items, and have them available for review at this lab meeting:

Final Concept Selection

Please present your final concept sketch/rendering (with as much detail as possible), including a description of how the product will be used, who will be using it, technical/mechanical details, specific technologies that you wish to incorporate, potential materials, etc. Show the concept selection matrix (screening or scoring or both) and describe any concept testing that you used to make these choices.

Concept Testing Plan

Prepare a concept testing plan. Who will you be testing? Will it be the same or a different group from your Customer/User Needs Assessment? What is your survey format? Phone, in person, Internet? How will you communicate the concept? Sketches, mock-ups, photos, renderings, storyboard, etc.? How will you get feedback from your customers? What method will you use to interpret the results? Chapter 8 will be useful in framing your plan.

Class 19: PEER REVIEW STUDIO – Concept Design Review
Monday, October 29th

PROJECT DELIVERABLE: *Updated customer needs, concept generation sketches, three concept renderings, and concept selection matrices, product specifications and drawings, photos of concept mock-ups*

Session objectives:

- Update your classmates as to progress on your product development effort.
- Make the first “public” presentation of your “proof-of-concept ideas”
- Gather feedback from classmates on your concept design and mockups

For this session:

1. Prepare a ONE-PAGE summary of your:
 - Mission statement

- Target market
- Salient customer needs

Plan to present this one page summary briefly at the beginning of the class in 2-3 minutes. This will bring the entire class up to speed on your project before they review your work.

2. Prepare your "proof-of-concept" sketches, product renderings and early prototypes so that everyone can understand your ideas. Come to class prepared to show it in a format that is easily readable. After a 2-3 minute review at the beginning of the class, we will spend about 50 minutes in a "tradeshow" environment during which you will wander around the classroom to look at the work. You are welcome to bring portable computers to set up your images. You should plan to handle any arrangements for using computers on your own. We will assign locations in the room.

To support your concepts, you should have the following materials available. (Each team will likely have done different versions of these. Use what you have already developed.)

- Customer/user needs hierarchy
- Mapping of customer needs to specifications
- Concept sketches
- Product renderings or mockups (3D renderings, early physical or web mockups)
- Concept screening and scoring matrices
- Reason for choosing the concept(s) you have developed for today

As we will only have about 50 minutes for this session, you should plan to have group members rotate responsibility for showing the concepts so that other group members can circulate. Think about the best way to efficiently and effectively collect feedback from your classmates. You may wish to have a mini-survey available for them to complete. Remember that each student will only have about 5 minutes to spend reviewing your work; so make your presentation as succinct as possible.

From this point forward, your focus will be on developing and testing your product concept with your customer base, obtaining feedback, incorporating it into your product, and preparing intermediate and final product prototypes. You will also need to develop a plausible business model and perform a rough financial analysis of the product. All of this will be required as a deliverable in your third peer review studio on Nov. 28.

Class 20: Testing and Refinement – Building Prototypes and Using CAD Tools Wednesday, October 31st

Read CHAPTER 13: ROBUST DESIGN and BOOST YOUR MARKETING ROI WITH EXPERIMENTAL DESIGN and prepare TEAM NEW ZEALAND (A). The focus of this case is on the role of experimentation in new product development. It exposes the subtle challenges of using simulation as an experimentation tool. It also highlights issues associated with integrating knowledge gained through experimentation with knowledge gained from experience. Address the following questions as you read the case:

1. How would you evaluate Team New Zealand's use of simulation in the design process? What are its advantages and disadvantages? How did their approach to simulation differ from that used by other syndicates?
2. Which yacht construction strategy should Team New Zealand follow? Why? How much improvement would you expect from each?
3. What would you advise Team New Zealand to do: Two similar boats now, two different boats now, or one boat now and one boat later?

Class 21: LAB – Final Specifications and Prototype Planning Monday, November 5th

The work you do for this lab will depend to some extent on the type of product you are developing. All teams should document the final specifications they intend to achieve and provide any documentation needed to support these decisions (as described in Chapter 5).

Those developing physical products should prepare final product renderings, assembly drawings of the product and a bill of materials indicating whether parts will be standard purchased parts or custom fabricated. An assembly drawing shows the overall product with each part in its “assembled” position. If it is clearer, you can use an “exploded” view instead. You will also want to prepare dimensioned sketches of each piece part and photocopies of vendor literature (e.g., catalog pages) for the standard purchased components. Indicate the material and process you have selected for each part, both for your prototype and for the final production version. The parts should be designed to be as close as possible to the intended final production version as possible.

Those developing software (web-based) products will prepare an overview of the modules contained in the product, the interfaces between them, and their primary functions. Indication should be made as to whether the module functions are available in existing software (e.g., database query software) or whether they will have to be custom designed. Specifications at this stage should be relatively clear – such that a programmer could work from them to develop code.

Class 22: DfX -- Design for Manufacturing and Cost
Wednesday, November 7th

Read CHAPTER 11: DESIGN FOR MANUFACTURING. Design for manufacturing is one of the many “design fors” that a product development team must undertake. In this class session we’ll talk about the various “design for x” activities, including manufacturing. Consider thought questions 1 and 2 at the end of Chapter 11. Read CHAPTER 15: PRODUCT DEVELOPMENT ECONOMICS. Consider thought questions 1 and 2 at the end of the chapter. Be prepared to disassemble and reassemble a product in class in order to evaluate its design-for-assembly merits.

Class 23: VETERAN’S DAY HOLIDAY
Monday, November 12th

Class 24: LAB – Prototype Development and Testing
Wednesday, November 14th

PROJECT DELIVERABLE: *Updated customer needs, concept generation sketches, concept selection matrices, product specifications and drawings, intermediate concept prototypes (photographs will do), and concept testing feedback.*

The goal of this lab is to get instructor feedback on your progress to date, with a focus on your prototype development and testing plan.

Class 25: DfX – Design for Environment
Monday, November 19th

Read Natural Capitalism - [THE NEXT INDUSTRIAL REVOLUTION, CHAPTER 1](#). The chapter provides a good overview of the business case for sustainability. Visit [CRADLE TO GRAVE – HOW PRODUCTS IMPACT NATURAL SYSTEMS](#), click through each of the six stages and read the first page that pops up. Following the links on each page is encouraged but entirely optional, except for the three additional links under the “emissions” page, which you should follow. What does designing products for environmental soundness entail? How might you make tradeoffs among cost, quality, features and environmental soundness when designing a product? What is sustainable design? Scan [THE CRADLE TO CRADLE ALTERNATIVE](#) website. What is the difference between the the “cradle to grave” perspective and the “cradle to cradle” alternative? How might you redesign or manufacture your product with this perspective in mind?

We will also hold a Friday tutorial (date TBA) on using a Life Cycle Analysis software tool. Read the [EIO-LCA Tutorial](http://www.eiolca.net/tutorial-j/tut_1.html) in preparation for this Friday Lab (http://www.eiolca.net/tutorial-j/tut_1.html)

Class 26: LAB – Finalize Financial Models and Review Product Testing
Wednesday, November 21st

Come prepared to review a draft financial model like that described in Chapter 15. Follow the guidelines provided in Chapter 15 of the book. Some questions that may guide your thinking about the costs associated with your product: How many stages do you expect your distribution process to have? What is the target price of your product? What is its target cost? Those of you developing physical products should construct a bill of material for the product that you can cost. You should be able to prepare a simple cost/price model that relates the delivery (manufacturing) cost of your product to the price that the end user will pay given specific margins at each stage of the channel. Perform a sensitivity analysis of the key economic uncertainties you face.

Often we find that students feel that they must make the product they are developing look profitable. We prefer realistic estimates! You can make any assumptions you like about how the product will come about – it can be produced and sold by a standalone company, or you can assume that it will be sold to and delivered by a larger concern. Most of you will want to assume that a fair amount of work (especially manufacturing) is outsourced.

Class 27: DfX – Design for Flexibility using Product Architecture
Monday, November 26th

Read CHAPTER 9: PRODUCT ARCHITECTURE, MASS CUSTOMIZI-WHO?, and [BEST PRACTICES – MASS CUSTOMIZATION AND BUILD-TO-ORDER MANUFACTURING](#). Complete exercise 1 or 3 at the end of Chapter 9. We will focus our discussion in this session on the definition of product architecture and the implications of product architecture decisions for product development, marketing, customers, etc. How might your product benefit from a product architecture/ platform strategy? Be prepared to discuss the relationship between product architecture and mass customization.

Class 28: PEER REVIEW STUDIO – Concept Prototype and Design Review Tradeshow
Wednesday, November 28th

PROJECT DELIVERABLE: *Updated customer needs, concept generation sketches, concept selection matrices, product specifications and drawings of final concept, and "proof of concept" prototypes*

Session objectives:

- Update your classmates as to your near final product development effort.
- Make the first “public” presentation of your “proof-of-concept” prototype
- Gather feedback from classmates on your prototype

For this session:

1. Prepare a ONE-PAGE summary of your:
 - Mission statement
 - Target market
 - Salient customer needs

Plan to present this one page summary briefly at the beginning of the class in 2-3 minutes. This will bring the entire class up to speed on your project before they review your work.

2. Prepare your "proof-of-concept" prototype. Come to class prepared to show it in a "tradeshow" environment during which your fellow students will wander around the room reviewing your work. You are welcome to bring portable computers to set up your displays. You should plan to handle any

arrangements for using computers on your own. We will assign locations in the room. Consider this a "dry run" for your final tradeshow presentation.

In addition to your "proof of concept" prototype, you should have the following materials available. (Each team will likely have done different versions of these. Use what you have already developed.)

- Customer/user needs hierarchy
- Mapping of customer needs to specifications
- Concept sketches
- Product renderings
- Concept screening and scoring matrices
- Reason for choosing the concept(s) you have developed for today
- Financial model and analysis

As with the previous peer review studio, you should plan to have group members rotate responsibility for showing the prototype so that other group members can circulate. Again, we should have about 50 minutes for this session. Think about the best way to efficiently and effectively collect feedback from your classmates. You may wish for your peers to test your final design and "proof of concept" prototype. Remember that each student will only have about 5 minutes to spend reviewing your work; so make your presentation as succinct as possible.

From this point forward, your focus will be on testing and refining your product design and prototype with your customer base, obtaining feedback, incorporating it into your product, and preparing the final product prototype.

Class 29: Supporting NPD – Intellectual Property Management
Monday, December 3rd

Read CHAPTER 14: PATENTS AND INTELLECTUAL PROPERTY and [THE NEW INSTANT COMPANIES](#). Intellectual property protection can be an important issue in new product development efforts. We'll have a guest lecturer speak with us about how to get intellectual property protection and what strategies various firms might choose. If you are interested in doing a patent search, see <http://www.patents.ibm.com/ibm.html>. "The New Instant Companies" also provides practical guidance if you think you might like to start a company around your product.

Class 30: Class Summary – Other Things You Can Do With This Process
Wednesday, December 5th

Read IF MANAGERS THOUGHT LIKE DESIGNERS. We will have a guest speaker who will talk about the process of design and how it can be applied much more widely than just to product development.

Class 31: Class Summary – Capturing Lessons Learned
Monday, December 10th

INDIVIDUAL ASSIGNMENTS: Reflect on the experience you have had working with your team in developing your product this semester. Capture 8 – 10 key lessons you have learned from the experience on post-it notes (one per post-it). *Bring those notes to class with you to share.*

Read LEARNING FROM PROJECTS – NOTE ON CONDUCTING A POSTMORTEM ANALYSIS. We will spend the last class session sharing lessons learned and synthesizing those lessons across the projects.

Final Tradeshow
Friday, December 14th, 3 – 6 p.m.

INDIVIDUAL DELIVERABLES:

- Turn in the journal you have been keeping throughout the semester. It will be returned at the beginning of the Spring semester.
- Team evaluations

Comment [SLB2]: No problem – need to get Leslie on board as well.

Comment [J3]: I think we would like to keep them if possible. Can we say – “Journals can be returned at the beginning of the Spring semester by contacting the Jono Hey”

PROJECT DELIVERABLES:

- Financial analysis
- Summary of the results of product testing and the changes to your product that you have made as a result of what you learned
- Softcopy of your presentation slides
- A photo of your final prototype. (We ask that you document your prototype in some way that will allow us to archive it with our other projects. This could mean that you take 35mm slides of your prototype, or that you take digital pictures.)

Group Presentation of Process and Prototype – Reception

The New Product Development Trade Show will take place Friday, December 14th, 2007 between 3 p.m. – 6 p.m. Attendance at the final exam IS MANDATORY. During the tradeshow, you will have the opportunity to display your product prototype to your peers, course faculty, the design coaches and a group of invited judges and guests.

Prepare a 10-minute presentation that describes your final product and the process you went through to arrive there. The presentation should be of the quality to convince a top management group to purchase the rights to your product or to fund its final development and launch. An effective presentation includes a slide presentation along with a display of the prototype. Your presentation should not only attempt to sell your prototype to the audience, but should also make clear the process you went through to develop the prototype. We suggest that you present:

- Your mission statement
- A summary of your customer/user needs analysis
- A couple of concepts you considered as alternatives to the one you developed
- A summary of your financial analysis
- A demonstration of your product prototype
- A list of the most important lessons you learned about the NPD process and teams

Please note that this event will be held in the Wells Fargo Room on the 5th floor of Cheit Hall.

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8. After selecting a material to view, a timer box will appear with the approximate download time. For large files, or slow Internet connection speeds, downloads may take longer than indicated by the timer box.
9. Links to upgrade your browser and download any required software applications are available on the Study.Net home page. Study.Net is best viewed with version 6.0 or higher of Internet Explorer or Netscape Communicator.