

**THE SMEAL COLLEGE OF BUSINESS
PENNSYLVANIA STATE UNIVERSITY**

**MKTG 542. NEW PRODUCT DEVELOPMENT (NPD)
Fall, 2009 (12:45-2:45, T&R, 125 Business Building)**

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OBJECTIVES

Understand the process and major challenges in NPD.

This course introduces you to critical steps and tools in NPD, as well as the key NPD challenges faced by senior managements, e.g., how to optimize a firm's new product portfolio.

Develop a new iPhone application concept

This course also provides you with an opportunity to try out the NPD process. A roadmap and a range of tools will be discussed in lectures, which you can use in developing your new product concept. Details are suggested in Appendix 2. This year, we will use iPhone as the platform.

Study Why New Products Fail

Identifying the losers before others do is a critical objective in NP and requires substantial knowledge, skill, and guts. This course will offer you an opportunity to practice this.

COURSE MATERIAL

Primary Textbook (Available at online bookstores such as BN.com or Amazon.com)

- Design and Marketing of New Products, G. Urban and J. Hauser, 1993, Prentice-Hall, Inc. **(U&H)**

Other Helpful Sources

- Product Design and Development, K. Ulrich and S. Eppinger, 4th ed. 2007, McGraw-Hill Companies – a very accessible textbook.
- Patent It Yourself, D. Pressman, 14th ed. 2009, Nolo, Berkeley, CA 94710.

Lecture Notes and (optional) Readings

- Lecture slides will be made available to you before each class.
- Readings can be downloaded from course website (<http://teaching.planetding.org>).

SUPPORT

The best time to meet is during my office hours, before and after each class, and if needed, by appointment. In general, email is the best way to get hold of me, and voicemail is the worst.

If you need help on patent search, please contact Kevin R. Harwell, Business Librarian. Google now has patent search capability. Alternatively, you can search the USPTO database on its website, and Google Patent search.

For filing patent on the USPTO website, full technical support is available through the Patent Electronic Business Center (EBC) at 866-217-9197 from 6 a.m. to 12 Midnight Eastern Time, Monday – Friday. Limited assistance is available at all other times through Electronic Business Support (EBS) at 1 800 786-9199 or 571-272-1000. They are generally very helpful.

Smeal RIIT group will provide technical feedbacks as you develop your iPhone app concepts. Mike Hofherr (mbh153@psu.edu), Manager of Information Technology, will manage the project and is the point person for you.

COURSE STRUCTURE

We have three types of classes: (1) Lectures, (2) aNPF (anticipating/analyzing New Product Failure) case presentation and discussion, and (3) Project presentation and team meetings.

Reading material (listed in this syllabus) and material in U&H are background readings intended to support the classroom learning, they provide more in-depth exposition of the relevant topics.

TEAMS

The class will be divided into teams. As a team, you will complete all tasks related to the project and aNPF case. Each team should have **three to four individuals**.

You can form your own team before the end of day on 10/22/09 (and please email me the team members as soon as you do). I will randomly assign remaining students into teams on 10/23/09 (after the add/drop period ends). I have several suggestions, but it's up to you to decide who you want to work with:

- You probably want to work with people you are comfortable with (among other reasons, you will generate and own something potentially valuable together).
- You may want to organize a team with balanced expertise (e.g., business versus technical).
- I encourage you to form multinational teams. This is both beneficial to your learning experience and helpful to the new product you will develop.
- Ideally at least one person in your team should have iPhone or easy access to iPhone

As a courtesy to your colleagues, I recommend you do NOT join a team if you might drop the course. Stay as a free agent instead.

PROJECT

Platform – iPhone app

- This year we will develop new product concepts in the form of new iPhone app
- iPhone has a well defined hardware and software capability
- Most of us like it
- The probability of you turning your idea into a real product is high
 - Rentacoder.com

Process

- I have provided a roadmap as Appendix 2. You don't have to follow it to the letter, but you should probably cover most of the steps described there, if not all, in your project.
- Going through the process is part of the learning
- You should check with our RIIT group contact as you develop your project on technical feasibility

The quality of your project has two components:

- The quality of your final concept
 - Does it have the potential to be a big commercial success?
- Due diligence in your development
 - Did you do a good job going through the various steps in NP?

Deliverables

- Present your project to the class on a poster.
 - You can find various guidelines on how to prepare a poster on the web.
- An extended executive summary (5 pages, single space, not including tables, figures, references, appendices).
 - You should include data collected as appendices (or summary of the data)

Best Project

- We will select the best project based on the poster presentation. Anyone who come to the poster presentation will be allowed to vote (and I might invite some guests).
- The RIIT group will develop the prototype based on the winning project (contingent on their capability)
- 20 bonus points

aNPF – ANTICIPATING/ANALYZING NEW PRODUCT FAILURE

While we can learn a lot from success stories, it is equally informative, and much more interesting, to study an ongoing case that is doomed to fail, especially such case is identified and analyzed by you!

To do this, as a team, you need to identify a product/service soon to be launched or recently launched. There are only two requirements for this product/service:

- The received wisdom (media, external reviews, senior managers, R&D people, etc) believes it will be a success, or have a large chance of being successful
- You disagree, you think it will most likely fail (or unless they adopt your recommendations)

What you need to do

- Demonstrate to the class (think of us as Board of Directors) why the received wisdom is wrong and why this product/service should be pulled/stopped.
- Your argument can be based on various aspects (and you don't need to have all of them), for example,
 - Key assumptions about consumers are wrong (WTP, benefit identified, preferences in general, etc)
 - Logic used by the firm in reaching their conclusion is flawed
 - Wrong marketing plan (wrong segmentation, incorrect segments targeted, and/or wrong positioning, inferior placement (channel), pricing...)
 - Lack of strategic consideration (how current and future competitors will act)
- You need to have quantitative analysis, using either secondary data or/and collecting your own (preference) data, to support your conclusion.

The quality of your aNPF case has two components (think Platform Diving):

- Degree of Difficulty
 - The difficulty is represented by how hard it is to demonstrate the product/service will fail. A product that everybody thinks will succeed is more difficult than one that some key weaknesses have already been identified.
- Analysis
 - This is, given the case you have selected, how well you have done in analyzing the case. For example, a lower score for analysis will be assigned if you miss key points (and your classmates identify them).

When your team will present:

- Randomly determined at the end of Week 1.

Deliverables

- Present your case to the class and try to convince the class that you are right, and the received wisdom is wrong. Each team will have 50 minutes. You should prepare Powerpoint based presentation for 35 minutes, with 15 minutes for questions (which could be during your presentation). This in general means you should have a minimum of 20 slides, but no more than 40. Send me a copy of the Powerpoint the day before your presentation.
- An extended executive summary (5 pages, single space, not including tables, figures, references, appendices), due the day before your presentation.

Best aNPF Case

- We will vote for the best case presented and analyzed
- The students in the winning team will each receive a DVD copy of my favorite movie that is related to NP
- 20 bonus points

EVALUATION OF aNPF PRESENTED BY OTHER TEAMS

The ability to provide constructive evaluations is a critical skill in NPD. So I want you to evaluate the evaluators. Here is what you need to do:

- Take notes during each aNPF presentation
- Write your evaluation after class and submit to me
- The evaluation should be 1 page long (single space) and include the following components
 - A brief summary of the case (one short paragraph)
 - Evidences/analysis they presented that have helped convince you the product/service will indeed fail (bullet points)
 - Evidences/analysis they presented that you don't think are helpful (bullet points)
 - The half-baked (deficient analysis, such as unrealistic assumption)
 - The really bad (errors in analysis, such as incorrect logic)
 - Key evidences/analysis the team missed that could have been used to support their conclusion– including the ones brought up by audience during class (bullet points)
 - Rate the Degree of Difficulty of the case, pick one from the following
 - *Really Easy, Easy, OK, Difficult, Very Difficult*
 - Rate the analysis of the case (given the case) – that is, whether they were able to convincingly argue against the received wisdom and sway you to believe the product will indeed fail (one bullet point).

Grades:

- 30 points each
- You can write evaluations for up to seven cases (obviously, you cannot write one for your own). Only the six best evaluations will be counted towards your final grade.

Email me the evaluations by the end of Sunday, for the aNPF cases presented in that week.

GRADING

There is no exam. Your grade depends on team-based work and individual-based work.

Team Based Grade	700	
Project		
Overall Quality		300
Poster Presentation		50
Extended Executive Summary		50
aNPF		
Overall Quality		200
Oral Presentation		50
Extended Executive Summary		50
Individual Based Grade	300	
Attendance and Participation		120
Evaluation of aNPF (best 6, each 30)		180

TOTAL		1000

Team Self-Evaluation

Please email me directly if you feel someone on your team is not doing his/her share of work (or any other problems). The team grade for a given team member may be adjusted downward based on these feedbacks, at my discretion.

You don't need to email me if there is no problem in your team.

Attendance and Participation

Absence is accepted with standard excuses (e.g., job interview, sick), but you need to email me in advance (unless it's impossible). You will lose 20 points for each unexcused absence. Since you have to be physically in class to participate (and evaluate the aNPF presentations), even excused absence may affect your participation grade. Simple air-time does not count.

Laptop Policy

Laptops should only be used for class related activities, mostly taking notes. It may be a good idea to use it especially for aNPF case (save your time later in preparing evaluation)

ETHICS

We subscribe to the Smeal professional standards. Please arrive on time and I promise to end each class on time. Please maintain a professional atmosphere in class, including, but not limited to, making only respectful comments, refraining from non-course related activities, and avoiding disrupting class (side conversation, cell phone sound, etc).

It is expected that each student should contribute substantially to every team assignment.

HONOR CODE

We, the Smeal College of Business Community, aspire to the highest ethical standards and will hold each other accountable to them. We will not engage in any action that is improper or that creates the appearance of impropriety in our academic lives, and we intend to hold to this standard in our future careers.

ACADEMIC INTEGRITY STATEMENT

Please include the following statements in all written assignments (project, aNPF and evaluations) to be handed in. You will lose 10% of the grade for an assignment if this is not included.

ACADEMIC INTEGRITY

I/We _____ affirm that I/We have neither given, utilized, received, nor witnessed unauthorized aid on this deliverable and have completed this work honestly and according to the professor's guidelines.

DELIVERABLES AND DEADLINES

Project (Team-Based, one copy from each team):

- Submit the general topic/idea (email me) before the end of the day on 11/3. You are free to change your idea later, as long as you keep me posted.
- Name your Extended Executive Summary as **542_NameofYourTeam_Project_NameofCase**
- Written Extended Executive Summary due before the end of the day on 12/3, submit via email, with subject line as **542, Name of your team, Project, Name of your project**

aNPF Case (Team-Based, one copy from each team):



- Submit the topic (email me) at least one week before presentation
- Written Extended Executive Summary and PowerPoint Slides (for presentation) due the day before your presentation
- Name your files as **542_NameofYourTeam_aNPF_NameofCase**
- Submit both to me in one email, with subject line as **542, Name of your team, aNPF, Name of your case**

aNPF Evaluation (Individual-Based):

- Due 11:59pm of the Sunday following the presentation (late submission will be accepted with penalty)
- Name your file as **542_YourName_Evaluation_NameofCase**
- Submit via email, with subject line as **542, Your Name, Evaluation, Name of Case You are Evaluating**

Remember to include Academic Integrity Pledge in all Written Submissions (worth 10% of the grade for each assignment)

MASTER SCHEDULE

CLASS	DAY	DATE	LECTURE/CASE	CASE/LECTURE**	PROJECT*
1	Tues	10/20	Introduction – Lock, Toothbrush, and other Fun Stuff		Form Team
2	Thurs	10/22	Pipeline and Portfolio Management		Finalize Team aNPF Sequence
3	Tues	10/27	No Regular Class Team Meetings with Me		
4	Thurs	10/29	iPhone app Technical Overview (RIIT Group) Market and Needs Identification		
5	Tues	11/3	Qualitative Research Jennifer C. Coupland	 aNPF Team Mercury	Project Idea Due
6	Thurs	11/5	Incentive Aligned Preference Measurement Methods	 aNPF Team Venus	
7	Tues	11/10	Benefit Segmentation, Positioning and Targeting	 aNPF Team Mars	
8	Thurs	11/12	Idea Generation, Selection, and Patent Application	 aNPF Team Jupiter	
9	Tues	11/17	Testing and Launch	 aNPF Team Saturn	
10	Thurs	11/19	No Regular Class Team Meetings with Me		
11	Tues	12/1	 aNPF Team Uranus	 aNPF Team Neptune	
12	Thurs	12/3	Disadoption, Social Network	 aNPF Team Europa	Project Executive Summary Due
13	Tues	12/8	Project Poster Presentation Selection of Best Project and best aNPF		

* Due before the end of the day indicated on the left.

** aNPF topic due 1 week before presentation, Powerpoint and Exe. Sum. due the day before.

(OPTIONAL) READING LIST (DOWNLOAD FROM COURSE WEBSITE)

- R1. Press Release on ITB, Penn State University, 2003
- R2. Staples lets customers do the design. Fortune, April 18, 2005. p48.
- R3. Ding, Min, Shtaerman; Alexander, Scannell; Esther B., Almeida; Ian A. and Romano,J, Interactive Toothbrush Game, US Patent Application 20060040246.
- R4. Basche, T. and M. E. Pennell. 2003. Customizable combination locking system using textual combinations. US Patent 6,621,405.
- R5. Why P&G Smile is So Bright, Business Week, August 1, 2002
- R6. Get a patent, WSJ, May 9, 2005.
- R7. Urban and Hauser, 2004, Listening In to Find Unmet Customer Needs and Solutions, Journal of Marketing, 68, 72-78.
- R8. The Carriage Trade, WSJ, October 21, 2004
- R9. Toubia, 2005. Idea Generation, Creativity, and Incentives, Marketing Science
- R10. Ding M. and Eliashberg, J. 2002, Structuring the New Product Development Pipeline, Management Science , 48(3), 343-363
- R11. Template for Provisional Patent Application.
- R12. Urban, Weinberg, and Hauser. 1996. Premarket Forecasting of Really New Products, Journal of Marketing, 60, pp. 47-60
- R13. Dahan E. and J. Hauser. 2001. The Virtual Customer, Journal of Product Innovation Management, 19, 5, 332-54.
- R14. Hauser, J. R. and V. R. Rao. 2004. Conjoint Analysis, Related Modeling, and Application. in Market Research and Modeling: Progress and Prospects: A Tribute to Paul Green. Y. Wind and P. E. Green, Eds., Kluwer Academic Publishers: 141-168.
- R15. Ding, M. 2007. An Incentive Aligned Mechanism for Conjoint Analysis. Journal of Marketing Research.
- R16. Ding, M. et al. Teaching Agents to Buy.
- R17. Ding, M. TOP 10 LIST OF SUBOPTIMAL NPD.
- R18. Ding, M. 2007. A Theory of Intraperson Games. Journal of Marketing.

APPENDIX 1. RELEVANT PSU POLICIES

Academic Integrity: According to the Penn State Principles and University Code of Conduct: Academic integrity is a basic guiding principle for all academic activity at Penn State University, allowing the pursuit of scholarly activity in an open, honest, and responsible manner. According to the University's Code of Conduct, you must neither engage in nor tolerate academic dishonesty. This includes, but is not limited to cheating, plagiarism, fabrication of information or citations, facilitating acts of academic dishonesty by others, unauthorized possession of examinations, submitting work of another person, or work previously used in another course without informing the instructor, or tampering with the academic work of other students.

Any violation of academic integrity will be investigated, and where warranted, punitive action will be taken. For every incident when a penalty of any kind is assessed, a report must be filed, using the *pdf* form at this URL: <https://intranet.smeal.psu.edu/smeal/integrity/index.html> This form is used for both undergraduate and graduate courses. This report must be signed by both the instructor and the student, and then submitted to the Associate Dean for Undergraduate Programs in 202 Business Building.

Affirmative Action & Sexual Harassment:

The Pennsylvania State University is committed to a policy where all persons shall have equal access to programs, facilities, admission, and employment without regard to personal characteristics not related to ability, performance, or qualifications as determined by University policy or by Commonwealth or Federal authorities. Penn State does not discriminate against any person because of age, ancestry, color, disability or handicap, national origin, race, religious creed, gender, sexual orientation, or veteran status. Direct all inquiries to the Affirmative Action Office, 328 Boucke Building.

Americans with Disabilities Act:

The Smeal College of Business Administration welcomes persons with disabilities to all of its classes, programs, and events. If you need accommodations, or have questions about access to buildings where Smeal College activities are held, please contact us in advance of your participation or visit. If you need assistance during a class, program, or event, please contact the member of our staff or faculty in charge. Access to Marketing courses should be arranged by contacting the Department of Marketing Office: (814) 865 - 1869.

An Invitation to Students with Learning Disabilities:

It is Penn State's policy to not discriminate against qualified students with documented disabilities in its educational programs. If you have a disability-related need for modifications in your testing or learning situation, your instructor should be notified during the first week of classes so that your needs can be accommodated. You will be asked to present documentation from the Office of Disability Services (located in 116 Boucke Building; (814) 863-1807) that describes the nature of your disability and the recommended remedy. You may refer to the Nondiscrimination Policy in the *Student Guide to University Policies and Rules*.

H1N1 (swine flu) Policy

According to CDC guidelines, if anyone has the symptoms associated with the flu, it is best if s/he does not come into contact with others for 7 days after the symptoms begin or until that person is symptom-free for 24 hours, whichever is longer. Please follow prudent procedures throughout the semester, such as, (1) Covering your nose and mouth with a tissue when coughing or sneezing, and discarding the tissue in the trash afterwards, (2) Washing hands often with soap and water, especially after coughing or sneezing, and 3) not touching eyes, nose, or mouth as much as possible. In compliance with Pennsylvania Department of Health and Centers for Disease Control recommendations, students should NOT attend class or any public gatherings while ill with influenza. It is very important that individuals avoid spreading the flu to others. Students with the flu do not need to provide a physician's certification of illness. However, ill students should inform their teachers (via email/phone) as soon as possible.

APPENDIX 2. A SUGGESTED ROADMAP OF NEW PRODUCT DEVELOPMENT PROJECT

WHAT IS A GOOD NEW PRODUCT

The project is meant as an exercise to help you appreciate the new product development process. Creating something at the end with substantial financial potential would be even better.

SOME DOS AND DON'TS ON SELECTING AN OPPORTUNITY

First of all, this should be a realistic project. It should be real in the sense that you should have some familiarity with the potential customers of the product, based on your professional background, personal life, or hobbies. Furthermore, you should have access to a pool of potential customers.

It should be real such that your team will be able to provide enough details such that skilled engineers (workers) in your field of invention will be able to produce your invention by reading your description.

There should be a sizable market for your product. The market does not have to be huge, but it must be attractive enough. Your invention should ideally also have strong intellectual property. It should ideally not rely on other patents (otherwise you need to license these patents before you can practice your own invention), broad, and unlikely been circumvented by future patents.

If you have a "once in a lifetime idea", you may want to keep it to yourself and select an alternative market for the project.

SAMPLE NEW PRODUCTS

Some products developed at previous classes I taught (MKTG542 at Smeal and 15.828 at Sloan (MIT)):

- Interactive Toothbrush
- Picture Lock
- Split-Cell Phone
- Multi-functional Showerhead
- Rotating Powerstrip

QUANTITATIVE VERSUS QUALITATIVE APPROACHES

I will highlight a few quantitative tools in class that are very useful in product development. Due to time constraint, you are not required to employ quantitative approaches in developing your new product for this course. On the other hand, if you are interested in doing such analysis (which means you also need to collect more data than stated in this Appendix), please see me.

INTELLECTUAL PROPERTY RIGHTS

Each team will be able to retain the rights to any inventions you develop in this course. Teams should meet early and discuss how to distribute any economic rewards arising from the intellectual property you create.

PART 1. IDENTIFY THE MARKET AND UNDERSTAND THE CUSTOMERS

You need to first identify ONE potential market to enter. This market must be reasonably focused (e.g., *help children learn reading* is appropriate, but *game* is too broad and not appropriate). Once the team agrees upon the market, you need to listen to the voice of the customers in your chosen market, learn their needs, and ascertain which segments you want to target.

Step 1. Focus Group OR Interview

Conduct focus groups (**2 groups, each with 5 individuals**) OR interviews (**individually, 10 total**) in order to listen to the voice of customers, in particular, with regard to their experience and (unmet) needs in this market.

Step 2. (Benefit) Segmentation and Targeting

Different people, most likely, will tell you different needs. In other situations, market is already well developed and it is not clear upfront which consumer needs you should target. In these cases, a quantitative approach of segmentation is appropriate. In other cases, the major unsatisfied needs become clear after focus group study and you can make a decision to target these needs without going through the formal steps of segmentation. *For your project, you can (1) use judgment to decide which needs you will target, then (2) identify the demographics of the target segments.*

OUTPUT I:

1. Specify the market you identified.
2. Summarize insights from the focus group and/or interviews.
3. Develop a list of common products and a list of attributes that customers generally use to describe products in this market.
4. *Organize* a list of customer needs in this market.
5. Define your target segments (based on the needs they have), justify your choice, and characterize the segments (the benefit the segments seek, their demographics, etc).

PART 2. PATENT SEARCH, CONCEPT GENERATION, AND PRELIMINARY CONCEPT SELECTION

You now have enough information about your market and target segments, and it's time to develop some specific ideas (while keeping in mind the needs/characteristics of the segment).

Step 1. Patent Search and Search for Existing Products (Apps)

To ensure you do not reinvent the wheel, this is the time you do a thorough patent search at USPTO and general search on existing products/applications.

A useful website is <http://www.pat2pdf.org>, it will give you the complete patent in PDF format if you provide the patent number (which you can obtain from USPTO). You can also use Google Patent Search for this purpose.

Step 2. Idea Generation

Equipped with the knowledge from step 1, and the customer needs (benefits) that the team intends to satisfy, the team will proceed to generate new product concepts that will meet such needs. One possibility is follows: (1) break the target product into difference components (e.g, A, B, C, D) using a criterion that is more appropriate for your product (e.g., think about the interactive toothbrush we discussed in class); (2) generate **4 alternative** sub-concepts for each of the components (e.g, A₁, A₂, A₃, A₄).

Step 3. Concept Selection

Follow the discussion on concept selection, identify the top **3 concepts** (e.g., A₁B₂C₁D₃) the team agrees are most promising from all possible combinations of the sub-concepts.

OUTPUT II:

1. A summary of patent search and web search.
2. Detailed description and sketches of the top 3 concepts, what customer needs each address, and why you choose them.

PART 3. FINAL NEW PRODUCT CONCEPT AND REFINEMENT

The goal here is to conduct marketing research and obtain customer reactions to your 3 concepts as well as competing products. This will help you to (1) identify the final concept and optimally position it (sometimes called identifying Core Benefit Proposition (CBP), see U&H), and (2) refine your new product concept. We could use several quantitative tools, e.g., conjoint analysis, to achieve this goal. For your project, however, you will use judgment instead (I will demonstrate state of the art practice of conjoint analysis in class).

Step 1. Concept Selection and Positioning

Take your final three concepts to **8-10** potential customers, and get their reactions to these concepts, relative to a set of competing products. Since your concepts target a specific unmet need (s) of one or more segments in the original market, you should only use individuals who belong to these targeted segments (you can use the same individuals from the focus group/interviews if they satisfy this criterion). Select the best concept based on the feedbacks and develop a positioning statement (CBP).

Step 2. Refinement

While a final concept should have been selected by now, there is still room for fine tuning. For example, you may want to decide what specific attribute (variations) you want to have in the final product (you should claim EVERYTHING in the patent application, but you should NOT implement everything in your product). Please refine the selected final concept based on the input from the 8-10 individuals in Step 1.

OUTPUT III:

1. The set of 3 concepts and competing products you showed to the users.
2. User responses to the concepts and competing products (8-10 users).
3. The selected final concept, its CBP, justify why you have selected it.
4. Changes made for the final concept based on user input in step 1 and why.

PART 4. DRAWINGS AND (POSSIBLY) PATENT APPLICATION

Step 1. Drawings and Prototyping

Provide detailed drawings of your invention. Please prepare several drawings of the new product you intend to build (both overall structure and how it actually works), using any drawing package of your choice. You will need these drawings in your patent application, or for presentation to potential investors, employees, and partners.

Step 2. Patent Application

You can file a provisional patent with USPTO if you believe the concept you created should be protected.

OUTPUT IV

1. Drawings