Purpose

The course seeks to provide an overview of the key issues facing technology-based firms. We will address:

- managing the challenge of technology and product obsolescence,
- market segmentation for the purposes of enterprise growth and customer needs assessment
- understanding and integrating perceived and latent customers needs into next generation designs
- validating product design features with market research methods, including conjoint analysis.
- managing the evolving complexity of systems and software
- designing new services
- organizing multifunctional teams for new product development
- leveraging technologies and skills into new markets
- understanding brand, channel, and business model issues for new market applications

You will be challenged to think "out of the box," to conceive and design products and services that can obsolete the way your company and your competitors currently do business. You will be asked to seek endorsement for your project work from executives in your corporation.

Bottom line: this course is a lot of work. Hopefully you will learn a new way of looking at innovation and business growth, and that perspective just might make a difference for your immediate and future career.

Your instructors:

This course will be taught by Marc H. Meyer and Alvin P. Lehnerd. Dr. Meyer, Matthews Distinguished University Professor, is director of the High Tech MBA, ranked amongst the country's best technology focused MBA programs by ComputerWorld and IEEE. He has also led the development of Northeastern's entrepreneurship program, now ranked #4 in the U.S. by Forbes. Dr. Meyer's research focuses on new product development. He was a cofounder of a real-time embedded systems company and has helped a number of entrepreneurs start and grow companies. He has also worked extensively in the computer, financial services, healthcare and consumer products industries for companies that include IBM, HP, P&G, and Masterfoods. You will be reading his book, The Power of Product Platforms, and during lectures, be presented with much of the material of his forthcoming book, Innovation and Corporate Growth: Developing Next Generation Products for New Market Applications. Dr. Meyer holds degrees from Harvard and MIT, and was the 2002 recipient of the Holland Award from the Industrial Research Institute.

Mr. Lehnerd is an Executive in Residence at Northeastern. He has held senior management positions at Steelcase (V.P. R&D and New Business Development), Sunbeam (President), Black and Decker (VP Operations, Manufacturing, R&D, New Business, New Ventures), and General Electric (Plant Manager). He has led a number of well-known new product successes. These include the first electronic iron, Black and Decker's power tools and the Dustbuster, and Steelcase's premium office furniture lines. Mr. Lehnerd also consults to large corporations. In Prof. Meyer's opinion, Al Lehnerd is one of the founding fathers of platform thinking. He also wrote The Power of Product Platforms.

The benefit your faculty "team" is that you will receive a variety of perspectives -- large corporations and entrepreneurial firms, or consumer products versus systems and software versus services -- all grounded in a common thought architecture of product families, product platforms, and value-rich products and services.
Now, PLEASE READ THE REST OF THIS SYLLABUS CAREFULLY FOR PROJECT WORK, CLASS QUESTIONS, and CLASS MILESTONES. THANK YOU!

Required Texts:


**Reading Package** (provided by the HT MBA administrators). Specific readings, order for, for specific classes are:

- Meyer, MH. and Friar, J., The SaveMe Software Case

**Sawtooth Software** (Conjoint Analysis). [www.sawtoothsoftware.com](http://www.sawtoothsoftware.com) -> Academic Aids. We have acquired an educational license for conjoint analysis software for your use. Conjoint is a pragmatic tool to operationalize research on how different types of users react to product features and price. You will be applying this technique on your Group Projects where it makes sense, (and on your Individual Projects if you want to do so.) Sawtooth provides tutorials on conjoint methods under the area labeled Academic Aids. Go there, and work through the materials. The educational version is just that: there is a limit on to 4 attributes and 50 respondents.
Grading components:

- **Class preparation and classroom participation** are important for doing well in this class. That means good listening and good feedback to your classmates, as well as being prepared to present your own materials in a concise, professional manner. Following the study group questions that we have developed for each class. You may be called upon to show your company’s market segmentation, organization of R&D, and its processes for new product development. Attendance, participation, and the quick assignments comprise 20% of your final grade.

- **AN INDIVIDUAL PROJECT. Get Yourself a Promotion. 50% of your grade.** The term project is an application of the key concepts presented and discussed in the class regarding the identification and integration and new markets with new technologies for new or renewed lines of products or services, or the revitalization of existing product lines. **Most students use this project as a way to get their superiors to listen to a well-conceived, well-researched plan to grow their particular business unit or service function – and ask them for the job of executing the plan!** Get a project identified soon! The paper is due on the 6th Class!

- **A GROUP PROJECT. New Technologies, Disruptive Solutions. 30% of your grade.** We will divide the class into teams to study disruptive technologies and emerging disruptive solutions. These projects and teams will be developed in class with the help of your instructor. **A Powerpoint presentation and executive memorandum on your findings is due on the 7th and final class meeting.** Any team laggards that come to the attention of the professor will be penalized a full Grade Point in their final grade. The professors will provide contacts in industry to help you with your research. Many of these will be HighTech MBA alums.
Guiding Questions for Your Individual Project (READ CAREFULLY)

The purpose of the individual project is to create a plan that can help you get a promotion when the plan is presented and endorsed by your senior management. Any one who gets promoted during the semester as a result of project work has a super leg up on getting an "A" in the class.

As you think about your term, please consider the following questions.

1. **A Next Generation Product Architecture and the Product Line based on that Architecture**: Can you design a next generation architecture that employs new technologies? What are the benefits of that architecture relative to your company's current offerings? What are the new products that could be based on that architecture?

2. **Product or Process Platform Development**: Are there opportunities to dramatically improve efficiency or costs by sharing subsystems and processes between product or service lines that do not share much at the present time? Is there an opportunity to bring substantial efficiency to your product development or product testing processes?

3. **Business Planning for a Specific New Market Application**: Are there emerging markets, or unserved niches within existing markets, that might be potentially addressed by current or newly emerging technology? Can you grow revenue? Can you conceive of a product or service line, a go to market strategy, a team and organization strategy, and an investment package needed for a successful outcome?

Any one of these three questions is the basis of a term project. You must also consider who is the **sponsoring executive** that would be most interested in your project. How can you attain access to that executive to “sponsor” your term project?

The **IDEAL PROJECT IS ONE THAT CAN LEAD TO INCREASED RESPONSIBILITIES AND PROMOTION IN THE COMING THREE to EIGHTEEN MONTHS.**

Planning or thinking “templates” are provided on the Professor's Web site. Look at them, use them! Go to marchmeyer.com, enter the teaching section, go to our Innovation Course, and hit the Templates button. They are in Spreadsheet format, so you can adjust them easily. Don’t use all the templates, but just those that help you think about your project. Model your project with those templates that make sense for you, and then write the text! **A style guide for the projects is also available on the Professor's Web site and also accompanies this syllabus.**

We want the report to be of strategic value to your corporation, something that you would be proud to present to your executive management team. **All reports will be treated as confidential material.** See the Individual Project Guide.

Guiding Questions for the Group Project (ALSO READ CAREFULLY)

The focus of the group project is for teams to develop a plan to use new technologies in their respective industries to create and market a new line of disruptive products or services. The disruptive nature of the project can be either in the product, in the manufacturing process, or in the go-to-market infrastructure. The project is titled: New Technologies, Disruptive Solutions.

Examples of a disruptive solutions based on new technologies include gene therapies, micro-encapsulation, fuel cells, medical products, chemical sniffers for bioterrorist threats, new storage applications, or technology convergence on mobile devices.

Student teams must apply the management frameworks for market segmentation, user needs, architecture, and product line roadmapping. They must also consider implications for marketing and business models. These projects must be more than technologies of the future – think **businesses of the future.** See the Group Project Guide.
# Class Schedule

<table>
<thead>
<tr>
<th>Class</th>
<th>Discussion Points</th>
<th>Readings &amp; Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Strategy &amp; Technology</strong></td>
<td><strong>The Enterprise Growth Framework</strong></td>
<td>Leavitt - Marketing Myopia</td>
</tr>
<tr>
<td><strong>9/24 PM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td> </td>
<td></td>
<td>Abbernathy and Wayne – Limits of Learning Curve</td>
</tr>
<tr>
<td> </td>
<td></td>
<td>Bower and Christensen - Disruptive Technologies</td>
</tr>
<tr>
<td> </td>
<td></td>
<td>Finklestein, Why Smart Execs Fail, Chapter 3</td>
</tr>
<tr>
<td> </td>
<td><strong>Set up Group Projects Based on Industry Verticals, and the Enterprise Growth Framework. Establish Team Roles.</strong></td>
<td>See Study Questions for Class 1.</td>
</tr>
<tr>
<td> </td>
<td><strong>Identify the Executive With Whom You Wish to Network had have sponsor your work.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>2. Managing Markets</strong></td>
<td><strong>The Market Segmentation Framework</strong></td>
<td>Moore, Crossing the Chasm</td>
</tr>
<tr>
<td><strong>10/8 AM</strong></td>
<td><strong>Segmentation By Users and Uses, User Needs, Competitive Analysis</strong></td>
<td>See Study Questions for Class 2</td>
</tr>
<tr>
<td> </td>
<td></td>
<td>Make Your Contacts with Management. Present them your personal project idea</td>
</tr>
<tr>
<td> </td>
<td></td>
<td>Winch Case</td>
</tr>
<tr>
<td><strong>10/22 PM</strong></td>
<td><strong>Latent Needs: Mousetraps, Services</strong></td>
<td>Marc Gobe, Emotional Branding, Chapters 1, 2, 3</td>
</tr>
<tr>
<td> </td>
<td></td>
<td>Aaker, “Should You Take Your Brand to Where the Action Is?” HBR 97501</td>
</tr>
<tr>
<td> </td>
<td></td>
<td>See Study Questions for Class 3</td>
</tr>
<tr>
<td><strong>4. Managing Architecture</strong></td>
<td><strong>The Modularity Framework</strong></td>
<td>Meyer &amp; Lehnerd, 1, 2, 3, 4</td>
</tr>
<tr>
<td><strong>11/5 AM</strong></td>
<td><strong>The Diaper Case: In Class Exercise</strong></td>
<td>Meyer and Webb, Mass Customization for Software</td>
</tr>
<tr>
<td><strong>Hand-in 1st Assignment</strong></td>
<td></td>
<td>Meyer &amp; Detore, “Product Development for Services”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Study Questions for Class 4</td>
</tr>
<tr>
<td><strong>5. Managing Organization</strong></td>
<td><strong>The Organization Framework</strong></td>
<td>Meyer &amp; Lehnerd, Chapter 5</td>
</tr>
<tr>
<td><strong>11/19 PM</strong></td>
<td><strong>SAVEME SOFTWARE Case</strong></td>
<td>Wheelwright and Clark, “Organizing and Leading Heavyweight Development Teams”, Chapter 8</td>
</tr>
<tr>
<td><strong>Hand-in 2nd Assignment</strong></td>
<td><strong>The Problem of Continuous Learning</strong></td>
<td>Meyer, Anzani, Walsh, 2 articles on IBM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>See Study Questions for Class 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Work on your Individual and Group Papers!</td>
</tr>
</tbody>
</table>
### 6. Innovative Business Modeling

<table>
<thead>
<tr>
<th>Hand-in Paper</th>
<th>12/3 AM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Business Challenges of New Market Applications</strong></td>
<td></td>
</tr>
<tr>
<td>• <strong>Products:</strong> Medical Tools</td>
<td></td>
</tr>
<tr>
<td>• <strong>Services:</strong> LincolnRe</td>
<td></td>
</tr>
<tr>
<td>• <strong>Upselling:</strong> MealBone</td>
<td></td>
</tr>
<tr>
<td>Developing New Brands</td>
<td></td>
</tr>
<tr>
<td>Developing Realistic Business Models</td>
<td></td>
</tr>
</tbody>
</table>

### 7. Market Research Projects

<table>
<thead>
<tr>
<th>Team Presentations of Group Projects</th>
<th>12/17 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The Power Tower Framework:</strong></td>
<td></td>
</tr>
<tr>
<td>Integrating the Elements for Growth</td>
<td></td>
</tr>
</tbody>
</table>

**Individual Project Papers Due**

**Group Projects Due & Presented**

Meyer & Lehnerd, Chap 9

Email any questions on assignments, deliverables, and study questions to: mhm@neu.edu
Study Questions:

Class 1: Strategy and Technology

- **Leavitt**: Look at your industry as it has progressed over the past twenty years and identify when your company or others have lost competitive advantage due to the reasons/causes identified by Leavitt. In other words, are there times, including the present moment, when you management team has viewed its market too narrowly? How has that limited the scope of technological innovation as well as targets for revenue growth?

- **Abernathy and Wayne**: In a similar line of questioning, has there been a time, including the present moment, when your company's manufacturing or production process has become a barrier to product and process innovation because it was so fine-tuned to volume production of the then current generation architecture?

- **Bower and Christensen**: Have there been times, including the present moment, when your management has failed to identify and provide solutions for new emerging customers needs and markets because it was too focused on its traditional mainstream users?

- **Finklestein**: Why did Motorola’s management ignore the invasion of digital technology into the cell phone industry? Who in your industry has acted the same way? Has your company ever missed the boat?

Class #2: Managing Markets:

- **Moore**: Is your company presently facing difficulties in its "growth" product lines in terms of the various "chasms" identified by Moore (in the Technology Life Cycle Model)?

- **Draw a segmentation on how your company traditionally segments its markets. Then, draw a segmentation (the same or different) that shows a novel approach, and new areas in which to leverage the companies technologies and services.** Download and print the market segmentation template as a starting point.
Class #3: User Centered Design
MARKET SEGMENTATION ASSIGNMENT DUE

• Leonard and Rayport: Empathic Design. A classic article. Read, enjoy, and think about how to apply this to your own business opportunities.

• Aaker: Branding: How does your company think about, and manage its brands? Do your company’s products tend to live up to its brand message? Has your company tried to address a new set of users that require a different brand communications message? Have these efforts succeeded, or did the company try to pitch the same message to a new set of users who needed to hear something quite different?

• Gobe: Emotional Branding. This shows the differences between consumers of different ages and ethnicities. Take your own personal favorite consumer product, and then be prepared to tell us how it would have to be redesigned to suit someone who is very different than you!

• Conjoint method: download the software, read on-line instruction at www.sawtoothsoftware.com, and design a simple study related to your group project, run it on yourselves, print out the results, and hand it in.

Class #4: Managing Technology and Architecture:
HAND IN USER CASE SCENARIO and PERCEIVED LATENT NEEDS Templates Applied to a Major Product Line in your Company

• Meyer & Lehnerd: These readings work through cases, frameworks, and the processes of composite design and modularization for products, systems, and information services. Try to apply them to a core product line in your business!

• Meyer and Webb: Ditto for Software, with the addition of layering technology. For those of you in software, I bet that you have stories to tell. For those of you not in software, architecture, layering, and 3rd parties are “what it is all about.”

• Meyer & DeTore: Product Development for Services: This is the application of composite design and latent needs to services. If you presently work in a services business, or if you manage an internal service at your company, how do the concepts in this paper apply to you? Can you draw a new composite design chart for the next generation of that service?
Class #5: Managing Organization:

- **Organization Readings**: The IBM articles collectively describe one of the greatest turnarounds in modern industrial history. As you read it, look at the multifunctional nature of the renewal: market focus, user needs, technology and architecture, organization, and branding.

- **Meyer and Lehnerd**: How does the "Charter" presented in Chapter 5 of our Book apply to your Individual Project? How does the Comic Picture at the end of Chapter 5 apply to your company?

- **Wheelwright and Clark**: We think dedicated, heavyweight teams are essential for new market applications. Has that been the experience in your company? Be prepared to talk about this. Also, in many companies, bold new projects become death marches of sorts, so that the heavy weight teams are exhausted by the time of product launch. Unfortunately, this is precisely the time when rapid market learning has to begin. What measures, in terms of staffing and resource allocation make sense to keep a new product on the right track?

- **The SaveMe Software Case**: The case takes us into the depths of a typical software company that has no real market strategy (it sells to anyone and everyone), no shared architecture of platforms, a functional organization that is broken, and no structured communication processes between marketing and engineering. How would you fix the company?!

  It is best to discuss this case in your study groups.
Class #6: Innovative Business Modeling

INDIVIDUAL PAPERS DUE

- Your Individual Projects are due. One hardcopy is required. Make sure your name and contact information is on the cover pages. Try to spell your professors’ names correctly!

Class #7: Disruptive Technologies and Businesses

GROUP PROJECTS DUE

- Your Group Projects are Due. Make sure your team names are on the cover page, with contact information
Managing Innovation for Products, Systems, and Services

The Individual Project & Style Guide
10 Pages Plus Exhibits

The purpose of the individual project is integrate and apply the concepts from class to a near term project that you would like to lead at your company. Think about a project that could be accomplished within an 18 month time frame, where you would have a direct role in managing the project, (with a significant promotion and accolades for a successful result!)

The types of projects most commonly performed are:

- Creating the next generation product/service architecture that addresses unmet latent needs in your current target market.
- Leveraging an existing architecture into new, emerging markets to increase revenue.
- Creating a new architecture and or platform subsystems that can be shared across products and/or processes to reduce costs.
- Improving core processes in manufacturing or service delivery that will offer "big impact" in cost of goods or delivery cycles.

Within these types of projects are plenty of room for market innovation, organizational innovation, and process innovation. What might you do in this course that could lead to career advancement for you personally?

The format of the project is:

Executive Summary (Clearly state the purpose of the project, resources required, and actions steps)

Main Content:

2. The Next Generation Solution: Technologies, Products, Services (use architecture, subsystem scalability, and product line mapping templates where appropriate)
3. Organization Recommendations (use organization templates where appropriate)
4. Resource Recommendations (use financial templates where appropriate)

Actions Steps (time line, resources required, and your role)

The style of the project is an executive memorandum that is clear and concise, and contains exhibits that can be used in a presentation to executives.

The papers should show obviously show an understanding and application of the major frameworks presented in class.
Managing Innovation for Products, Systems, and Services
The Group Project

Business Strategies for Disruptive Technologies

12 Page PowerPoint Presentation
4 Page Executive Memorandum

The purpose of the group project is to integrate and apply the concepts from class as a multifunctional team to either a technological discontinuity or a major new market application for current industry technology. Focus on the market dimension of the opportunity as much as the technology dimensions: Market Segments, User Needs, Competitive Analysis, and Go to Market Strategies – as much as Technology and Architecture.

The hand-in will be a PowerPoint presentation, plus an Executive Memorandum that both critiques and provides suggestions with respect to the following:

1. Identify the disruptive technologies, and assess IP issues. This should be more than a cursory investigation.

2. Identify buyer and/or the end-users, and specify their needs, both perceived and latent, for products based on the technologies in (1). This should include a market segmentation framework, and a user case scenario for a primary user of the innovation, “today” and “tomorrow”. Field visits are essential.

3. A competitive benchmark on function and price, e.g. of products currently addressing these users – the current state of the target application space.

4. The product line that could emerge from the technologies show in (1) that would meet the buyers in (2). This should include an architecture for the new product line, as well as a product line roadmap.

5. The requirements for a "go to market" strategy that would best suit the innovation. This should include branding, price, and distribution channel.

6. A discussion of the implications of the disruptive technology for established business models.

Roles for Team Members:

Not everyone can do everything, or be responsible for everything. We suggest that you organize your team in accordance with the team organization principles that we discuss in class, a trial application for your group projects.

- Project facilitator and devil’s advocate
- Technology and IP diggers
- Segmentation & competitive analysis researcher
- User needs diggers and product designers
- Go to market /channel experts

Each team should divide its resources to accomplish these tasks. If someone is not working, the professor wants to hear about it well before the end of the semester!