

**Module 1: The Innovation Challenge**

[01] 10:05AM Thu, Sep 9, Hawes Hall 201

[02] 11:40AM Thu, Sep 9, Hawes Hall 201

**TOPIC**

Innovation & Uncertainty

**MATERIALS**

The Fate of the Vasa (605-026)



[MIPD Introduction](#)

**ASSIGNMENT**

In today's class we will journey back in time to the 1600's (feel free to dress appropriately). The case describes a project to build the most expensive, powerful and elaborate naval warship of its time. Upon launch, this magnificent vessel sailed less than 1400 yards before heeling over (a nautical term) and sinking to the bottom of Stockholm harbor. Our quest is to resolve a puzzle that has intrigued historians since the ship was rediscovered in 1956: Why did the Vasa meet such a fate? We will then attempt to understand whether history might have been written differently: Could this fate have been avoided, and if so, how?

I expect every student attending class to read today's case - after all, it is only six pages long. After our discussion, I will give an overview of the course, describing its overall structure, the main themes it develops and the variety of contexts that we will examine.

See you in class...

[01] 10:05AM Fri, Sep 10, Hawes Hall 201

[02] 11:40AM Fri, Sep 10, Hawes Hall 201

## TOPIC

Innovation & Uncertainty

## MATERIALS



Hewlett-Packard: The Flight of the Kittyhawk (697060)

## ASSIGNMENT

The case describes an attempt by Hewlett-Packard's Disc-Memory Division to develop and introduce a revolutionary 1.3inch disk drive - the smallest ever developed:

1. What mistakes did HP make in executing the Kittyhawk project? What did they do well?
2. What uncertainties did the team face? How did it attempt to resolve them?
3. Was this a tale of bad luck or poor judgement?
4. How would you prevent this outcome from happening again?

[01] 10:05AM Thu, Sep 16, Hawes Hall 201

[02] 11:40AM Thu, Sep 16, Hawes Hall 201

## TOPIC

Innovation & Uncertainty

## MATERIALS

 [Virgin.com \(601041\)](#)

 [Virgin.com Poll](#)

## ASSIGNMENT

The case describes Virgin's approach to building its dot.com business, and the development of one of its ventures - Virgin Cars. Please answer the following questions:

1. What explains Virgin's success as a company?
2. How does Virgin identify opportunities for innovation? What capabilities does it leverage to exploit these opportunities?
3. What should McCallum do about the .com business (you should specifically address the issues on the design of its information systems, incentive systems, and control systems)?

Please take the class poll.

[01] 10:05AM Fri, Sep 17, Hawes Hall 201

[02] 11:40AM Fri, Sep 17, Hawes Hall 201

## TOPIC

Innovation & Uncertainty

## ASSIGNMENT

Please come to class in a jovial mood. We will have some entertaining guests...

Also, please ensure you complete the class poll.

## End of Module 1: The Innovation Challenge

**Module 2: Building Capabilities for Innovation**

[01] 10:05AM Thu, Sep 23, Hawes Hall 201

[02] 11:40AM Thu, Sep 23, Hawes Hall 201

**TOPIC**

Managing Uncertainty via Flexibility

**MATERIALS**

 Activision: The 'Kelly Slater's Pro Surfer' Project (605020)  
*Spangler distribution*

 "Gaming Goes to Hollywood." The Economist, March 27, 2004. (Optional)

 [Activision Poll](#)

 [MIPD Module 1 Wrap](#)

**ASSIGNMENT**

The case describes Activision's game development process, and the history of the firm's "Kelly Slater's Pro Surfer" (KSPS) project. In June 2002, this project has reached the "Alpha" review stage, at which point a decision must be made as to when to launch the game. Activision's "Green Light" committee, which reviews the progress of all game development projects, is considering two alternatives: A September 2002 launch; or a March 2003 launch. Consider the following questions:

1. What are the competitive dynamics of the gaming industry in 2002? What does Activision have to do well to compete effectively in this industry?
2. Evaluate Activision's "Green Light" process for game development. What are its strengths/weaknesses?
3. When should Activision launch the "Kelly Slater's Pro Surfer" game? September 2002 or March 2003? Be prepared to share your reasoning AND your analysis in class.

Please answer the class poll. The poll will shut at 9.00am.

[01] 10:05AM Fri, Sep 24, Hawes Hall 201

[02] 11:40AM Fri, Sep 24, Hawes Hall 201

## TOPIC

Managing Uncertainty via Flexibility

## MATERIALS



Product Development at Dell Computer Corporation (699010)



Cooper, Robert. "Stage-Gate Systems: A New Tool for Managing New Products." *Business Horizons*, May-June 1990.

## ASSIGNMENT

Over the last few years, Dell Computer Corporation has created much value for its shareholders but not without going through some tough times. The case describes how Dell redesigned its product development process after experiencing a major product setback and a significant decline in firm profits in 1993.

1. What are the competitive dynamics of the computer industry in 1993? What about the portable computer segment?
2. What does Dell have to do well to compete in this industry?
3. Why has Dell introduced the new 18-month development process? What are they trying to fix?
4. Which battery option should Holliday's team select? Go with the proven NiHi battery? Or the new LiOn battery technology? Or should they defer the decision to later stages?

[01] 10:05AM Wed, Sep 29, Hawes Hall 201

[02] 11:40AM Wed, Sep 29, Hawes Hall 201

## TOPIC

Managing Uncertainty via Flexibility

## MATERIALS

 Microsoft Office 2000 (600097)

 [Microsoft Office 2000](#)

## ASSIGNMENT

Important Note: Microsoft Office 2000 is a multimedia case, comprising both text and video clips. The video clips contain important insights not replicated in the text.

The case describes the history of Microsoft Office and the development of Office 2000. At the end of this project, Steven Sinofsky, Vice President for Office, must establish the direction for the next generation product. His task is complicated by conflicting messages about the priorities for the next release, as well as complaints from his developers about the effectiveness of the overall development process. Please consider the following questions:

1. What is your assessment of the Office 2000 project? What criteria would you use to judge this project?
2. Critique the *process* through which Office 2000 was developed. Specifically:
  - How did the team resolve uncertainty in the early stages of development?
  - What role do *Milestones* and *Daily Builds* play in development?
3. How has Microsoft's approach to development changed over the last ten years? Why has it changed?
4. What should Sinofsky do? Be specific in your recommendations.

NB: For the purposes of any analysis, you can assume that 500 developers were employed on the Office 2000 project.

[01] 10:05AM Thu, Sep 30, Hawes Hall 201

[02] 11:40AM Thu, Sep 30, Hawes Hall 201

## TOPIC

Experimentation & Rehearsal

## MATERIALS



Team New Zealand (A) (697040)

## ASSIGNMENT

This case revolves around the design and development of Team New Zealand's yacht for the 1995 competition, which was to be held in San Diego. Traditionally, the design of yachts for the America's Cup have been driven by the use of experienced designers and the construction of several small-scale prototypes. For 1995 however, significant advances in computer-aided design programs and hardware speed had enabled many syndicates for the first time to make use of simulation in their development process. The case discusses the benefits and challenges associated with these different experimentation methods, and the manner in which they are both integrated with the experiences of the lead designer and crew. Please consider the following questions:

1. Which yacht construction strategy should Team New Zealand follow? Why? How much improvement would you expect from each?
2. Evaluate how Team New Zealand has set up its syndicate and the way it is running product development. What are the strengths and weaknesses of its program?

[01] 10:05AM Wed, Oct 6, Hawes Hall 201

[02] 11:40AM Wed, Oct 6, Hawes Hall 201

## TOPIC

Experimentation & Rehearsal

## MATERIALS



Bank of America (A) (603022)

## ASSIGNMENT

The case describes Bank of America's attempt at service innovation via the use of experimentation. Please answer the following questions:

1. How would you characterize Bank of America's system for developing new services?
2. What role does experimentation play? How do companies maximize their learning from experimentation?
3. Compare Bank of America's process to other product development cases we have studied? What are the unique challenges of developing a new service?
4. Decision: Should Butler and Brady accept ten additional bank branches into its experimentation portfolio? Why?

[01] 10:05AM Thu, Oct 7, Hawes Hall 201

[02] 11:40AM Thu, Oct 7, Hawes Hall 201

## TOPIC

Experimentation & Rehearsal

## MATERIALS

 People's Light and Theatre Company, The (600055)

 Slatkin, Leonard. "Inauthentic Beethoven, but Authentically So." New York Times, February 15, 2004.

## ASSIGNMENT

The case describes the operations of a theatre company in Pennsylvania. Please consider the following questions:

1. Identify and characterize the process by which PLT creates and delivers a play.
2. What are the differences and similarities between the PLT process vs. stage gate (e.g., Dell, Activision) and milestone (e.g., Microsoft) style processes?
3. What is the purpose of rehearsal? How does this activity differ from experimentation, prototyping, simulation, or production manufacturing runs?
4. Compare and contrast the experimentation approaches used by Team New Zealand, Bank of America and PLT. What drives the difference between them?

[01] 10:05AM Fri, Oct 8, Hawes Hall 201

[02] 11:40AM Fri, Oct 8, Hawes Hall 201

## TOPIC

Innovation & Organizational Design

## MATERIALS



The Rise and Fall of Iridium (N9-601-040)

## ASSIGNMENT

The case describes the history of Iridium, the world's first mobile satellite service provider, which began service in 1998 and filed for bankruptcy one year later.

1. Who was to blame for Iridium's failure? Justify your choice of fall-guy.
2. Evaluate Iridium's system design and its organizational structure.
3. At what point could you have known this project would fail? Why wasn't it stopped?
4. What lessons does Iridium provide for how large complex projects should be managed?

[01] 10:05AM Thu, Oct 14, Hawes Hall 201

[02] 11:40AM Thu, Oct 14, Hawes Hall 201

## TOPIC

Innovation & Organizational Design

## MATERIALS



Space Data Corporation (602121)



[Space Data Video - Please Watch \(10mins\)!](#)



[Space Data Corp. Poll](#)

## ASSIGNMENT

The case describes the evolution of Space Data Corporation, a firm that is developing a communications platform with the power to provide complete national coverage for paging, messaging, voice and other wireless applications. In September 2001, Space Data's founders are faced with some difficult choices with regard to their future direction.

1. Critique Space Data's progress to date in developing their venture. Contrast its approach to that of Iridium. What insights do you draw from this comparison?
2. Evaluate Space Data's flight testing program. You should focus your detailed analysis on **Exhibit 13**, which describes each test in detail. In your analysis, consider:
  - What is the overall logic of the approach they are taking?
  - How have they responded to the information generated in each test?
  - Are they ready to fly now? If not, what tests should be run next?
3. Which application (paging, voice, or telemetry) should Space Data focus on? Why?

Please answer the class poll.

[01] 10:05AM Fri, Oct 15, Hawes Hall 201

[02] 11:40AM Fri, Oct 15, Hawes Hall 201

## TOPIC

Innovation & Organizational Design

## MATERIALS

 Handspring (N9-801-112)

 [Handspring Slides](#)

 [Venture Design Slides](#)

## ASSIGNMENT

The case highlights how Jeff Hawkins and Donna Dubinsky founded two handheld computing companies - 6 years apart. In our discussions, we will focus on assessing Handspring's venture design - you need not address the IPO pricing issue.

1. Why did Hawkins and Dubinsky leave Palm? What did they achieve by moving to a start-up?

2. Evaluate the choices Handspring made in:

- Engineering and product design
- Manufacturing and logistics strategy
- Marketing and channel strategy

## End of Module 2: Building Capabilities for Innovation

**Module 4: Designing Innovation Networks**

[01] 10:05AM Thu, Oct 21, Hawes Hall 201

[02] 11:40AM Thu, Oct 21, Hawes Hall 201

**TOPIC**

Innovation, Uncertainty and Firm Boundaries

**MATERIALS**

 [Nucleon, Inc. \(692041\)](#)

 [Nucleon Poll](#)

 [Nucleon Slides](#)

**ASSIGNMENT**

Nucleon is a small biotechnology company whose first potential product is about to enter clinical testing. Before Nucleon can begin clinical trials, however, its management must decide how and where to manufacture the product. Three options are being contemplated: 1) build an in-house pilot plant, 2) contract production to a third-party, 3) license the development, manufacturing, and marketing rights to a corporate partner.

1. What are your recommendations regarding the manufacturing of CRP-1 for Phase I and Phase II clinical trials? What are your recommendations regarding manufacturing for Phase III clinical trials and commercialization?
2. What is the value of CRP-I to Nucleon using your chosen strategy for phases I/II/III (i.e., what is the NPV of the project)?
3. What is your recommendation regarding Nucleon's long-term manufacturing strategy? What should this company look like in ten years (e.g., an R&D boutique with pilot scale manufacturing capabilities, or an integrated manufacturing enterprise)?

**End of Module 4: Designing Innovation Networks**

**Module 2: Building Capabilities for Innovation**

[01] 10:05AM Fri, Oct 22, Hawes Hall 201

[02] 11:40AM Fri, Oct 22, Hawes Hall 201

**TOPIC**

Program & Portfolio Management

**MATERIALS**

 Mission to Mars (A) (N9-603-083)

 Kerr, Richard. "Failed CONTOUR Comet Mission Melted Itself Down." Science Magazine, October 24, 2003. (Optional)

 [Mars Slides](#)

**ASSIGNMENT**

The case describes the history of the "Faster, Better, Cheaper" initiative at NASA, through the lens of the program for Mars Exploration. Firouz Naderi, newly-appointed Mars Program Manager, is faced with some tough decisions in spring 2000 after the failure of two successive missions.

1. What is your evaluation of the Faster, Better, Cheaper initiative? What were its aims? What did it do well?
2. Are smaller missions more or less risky than larger missions? What does the data suggest (e.g., in Exhibits 7 and 8)?
3. What should NASA do with respect to the 2001 Mars missions? Why?
4. How should Naderi re-construct the Mars Program? Be specific about the changes he must make. (You may wish to think about what it means to run a "Program").

NB: Exhibits provide data which are often useful for analysis. Wise is the student who remembers this...

[01] 10:05AM Wed, Oct 27, Hawes Hall 201

[02] 11:40AM Wed, Oct 27, Hawes Hall 201

## TOPIC

Program & Portfolio Management

## MATERIALS

 Le Petit Chef (602080)

 [LPC Portfolio Slide](#)

## ASSIGNMENT

Brigitte Gagné, Le Petit Chef's new director of Microwave R&D, is in the process of deciding the product development agenda for the next year. She has a pressing deadline to meet - the executive board is meeting in Paris tomorrow to review her choices.

1. What should Gagné do? Specifically, which projects should she fund and why? How should she handle the executive meeting?
2. What factors explain Le Petit Chef's poor performance? What actions would you recommend to remedy the situation?

This assignment should be completed in teams. Your team should develop a presentation of not more than 4 slides, to cover your analysis of the situation, and recommendations to Le Petit Chef's board. Email slides to amaccormack@hbs.edu by 9am on the day of class, using the file format "Section1MacCormack" (use the surname of your first listed team member). Three teams will be randomly chosen to present in class. Presentations can last a maximum of 10 minutes. I suggest having only 2 people speak.

NB: If for any reason you do not email me your slides by 9am, bring overheads to class to present.

[01] 10:05AM Thu, Oct 28, Hawes Hall 201

[02] 11:40AM Thu, Oct 28, Hawes Hall 201

## TOPIC

Program & Portfolio Management

## MATERIALS

 "The Aggregate Project Plan," Chapter 4 from *Revolutionizing Product Development*, Wheelwright & Clark, Free Press, 1992.

 Activision: The 'Kelly Slater's Pro Surfer' Project (605020)  
You received this at the beginning of the semester. It is the same Activision case.  
*Spangler distribution*

 "Managing Product Families: The Case of the Sony Walkman," Chapter 7 from *Managing Strategic Innovation*, Sanderson, S. and M. Uzumeri, Oxford University Press, 1997. (Optional)

 [Module 2 Wrap-up](#)

## ASSIGNMENT

The article describes a conceptual framework to help firms assess and manage their project portfolios. Read the article then reacquaint yourself with the Activision case. Answer the following questions:

1. What are the main principles of project portfolio management? What types of problems would you expect to find in firms that do not effectively manage their project portfolios?
2. How should we think about portfolio management at a firm like Activision? What types of frameworks or principles would help them? What are the challenges in applying portfolio management techniques in highly uncertain environments?

## End of Module 2: Building Capabilities for Innovation

**Module 3: Managing the Sources of Innovation**

[01] 10:05AM Fri, Oct 29, Hawes Hall 201

[02] 11:40AM Fri, Oct 29, Hawes Hall 201

**TOPIC**

The Sources of Innovation

This class will be led by Professor Roberto Verganti, from the Politecnico de Milano. Roberto is a leading authority on the management of design, having conducted a multi-year research study on the topic of how successful Italian firms make use of "designers" in their innovation processes. To get a flavor of the type of products and firms we are going to talk about, you may wish to visit a few websites of Italian firms that considered design leaders in their industry:

<http://www.edra.com> (home furniture)

<http://www.artemide.com/> (lighting)

<http://www.alessi.com/> (kitchenware)

**MATERIALS**

 Verganti, Roberto. "Design as Brokering of Languages: Innovation strategies in Italian firms." Design Management Journal, Summer 2003.

 "Sorry, No Beige." Apple Media Arts, Summer 1998. (Optional)

 [Apple iMac Photos](#)

 [Design Lecture Slides](#)

**ASSIGNMENT**

Note that this is a team assignment.

The reading describes how every product can be described according to two dimensions: its functionality and its meaning. Consider, for example, a Barbour Bedale winter jacket (<http://www.barbour.com>). Its functionality protects you from the rain and wind, while allowing you to carry keys and other items in your pockets. Its meaning is that of an elegant jacket whose elegance is not related to expensive fabric or stylish tailoring but by the thoughts it evokes of a noble country life, horse-riding, foxhunting, and castles in the English Countryside! In other words, every product has a message that goes beyond its pure functionality. Every product speaks with a "language" made up of "signs" (e.g., its form, texture, materials, color, name, functionality, etc.). The Barbour achieves its meaning through the choice of a waterproof fabric, saddle-fitting cut, corduroy collar, Prince-of-Whales texture, dark green color, waxy exterior coating, two-way zipper and hand-warmer pockets.

Assignment Questions:

Consider the 1st version of the Apple I-Mac, launched in 1998 (see picture in a separate file):

1. **Meaning.** What meaning/messages does the I-Mac invoke? How would you describe its peculiar personality? Try

## Syllabus for Managing Innovation and Product Development

to be as concise as possible: use only a few words or sentences.

2. **Language.** What are the signs that bring you this message? What materials, forms, functions, symbols, etc. did the designers choose through which this product speaks?

3. **Inspirations.** Find pictures of products released prior to I-Mac in other industries that used similar signs and a similar design language. In other words, products from which the I-Mac took inspiration in terms of design language. Why did you choose these products?

4. **Influences.** Find pictures of products released after I-Mac in other industries that used similar signs and a similar design language. In other words, products that took inspiration from the I-Mac in terms of design language. Why did you choose these products?

Please capture your answers/photos on no more than three slides, and email them to me (amaccormack@hbs.edu) **no later than 8:00 am on the morning of class using the file format "Section1MacCormack"**. We will ask 3 teams to share their ideas with us in class.

[01] 10:05AM Wed, Nov 10, Hawes Hall 201

[02] 11:40AM Wed, Nov 10, Hawes Hall 201

## TOPIC

The Sources of Innovation

## MATERIALS

 Innovation at 3M Corporation (A) (699012)

 [3M Slides](#)

## ASSIGNMENT

The case describes how 3M Corporation introduces and learns a new and innovative methodology called Lead User Research to understand future customer and market needs. A team from 3M's Medical-Surgical Markets Division applies the Lead User methodology to the field of surgical infection control and discovers not only new product concepts but also a potentially promising new business strategy.

1. How would you characterize 3M's traditional general system for innovation? What are its strengths and weaknesses?
2. Why does 3M need to be closer to the user? What have been the difficulties in getting closer to the user?
3. How is "Lead User Research" different from traditional market research? In what types of markets is this technique most valuable? What are its risks?
4. Can you think of examples (from your own experience or elsewhere) where users have developed important innovations?
5. What should the Medical-Surgical team recommend to management? A new line of products or a new business strategy?

[01] 10:05AM Thu, Nov 11, Hawes Hall 201

[02] 11:40AM Thu, Nov 11, Hawes Hall 201

## TOPIC

The sources of innovation

## MATERIALS



Eli Lilly and Company: Drug Development Strategy (A) (698010)

*Classroom*



["Drug Discovery" from Chemical and Engineering News, July 26, 2004.](#)

## ASSIGNMENT

As emerging technologies offer new opportunities for increased development productivity and innovation, firms struggle with the uncertainty and integration of such technologies into their complex processes. One industry where the stakes are very high is the rapidly changing and very competitive pharmaceutical industry.

Today's case on Eli Lilly deals with these issues during the development of a new migraine drug and "racing" it to market.

1. What are some of the competitive challenges that pharmaceutical companies face in the 1990s (and beyond)? What are the resulting implications for the new drug development process?
2. How is "combinatorial chemistry" (combiChem) changing the drug discovery process? How does it affect the role of learning and experimentation? What are its risks?
3. How does combiChem technology affect the different stakeholders in the development process (e.g., traditional chemists, research scientists, senior managers)? Any suggestion for how to integrate the technology?
4. As Bianca Sharma, what would you recommend to the PTAC? Take the lead compound directly into clinicals and race it to the market? Or spend some more time refining it? Or spend a lot more time to discover a drug platform? In your analysis, pay close attention to the experts in Exhibit 10. Why is there so much disagreement?

[01] 10:05AM Fri, Nov 12, Hawes Hall 201

[02] 11:40AM Fri, Nov 12, Hawes Hall 201

## TOPIC

The Sources of Innovation

## MATERIALS

 [Dragon's Teeth Vineyards \(604069\)](#)

 [Dragon's Teeth Vineyards Poll](#)

 [Thias Chew Over Biotech Food \(Optional\)](#)

## ASSIGNMENT

The case describes some critical decisions facing Peter Degroot, CEO of a South African wine producer, Dragon's Teeth Vineyards (DTV) in the fall of 2003. Specifically, the use of genetically modified organisms (GMOs) in wine promises to revolutionize the industry, allowing producers to lower costs significantly, while improving the quality and consistency of their products. The potential risks are high however, given consumers are wary of genetically modified foods, and the industry's standards bodies disagree on their use. Consider the following questions:

1. What are the dynamics of competition in the wine industry? How will the use of GMOs change their dynamics?
2. What explains the differences in regional attitudes to GMO use in wines? Who is right?
3. Should DTV consider using GM yeasts? Should they consider using GM vines? Why?
4. Should DTV act alone, or try to lobby the industry to move forward in a coordinated manner?

Please answer the poll.

[01] 10:05AM Wed, Nov 17, Hawes Hall 201

[02] 11:40AM Wed, Nov 17, Hawes Hall 201

## TOPIC

Sources of Innovation

## MATERIALS



[Extreme Ironing Website \(Optional\)](#)

## ASSIGNMENT

We will wrap up our discussion on the "Sources of Innovation" using a team project based upon three of the innovation strategies we have discussed in class: design driven innovation, lead user innovation and technology (science/engineering) driven innovation. The approach each team should use will be posted to the course platform under "resources" in due course.

Each team should develop and present a new innovation concept (or "concepts") on the following topic: The Purpose, Activity, Meaning and Objects used in Ironing. Concepts should be feasible within a 5-year time-frame (i.e., no science fiction!).

Your presentation should last for 5-10 minutes, with a maximum of 4 slides. You can also bring to class articles, pictures, magazine clippings, people (really) and/or any other artifacts that provide support for or have influenced your proposal. But remember, your concept should, at its heart, stem from the innovation approach that your team has been assigned.

Please think about the following questions:

1. What were the chief inspirations for your selected concept proposal(s)?
2. How would you characterize the process through which you arrived at it/them?
3. Which external parties (individuals or firms) would you want to involve to confirm the merits of your proposal?

Send team slides to me ([amaccormack@hbs.edu](mailto:amaccormack@hbs.edu)) by 8am on the day of class (file format: Section2MacCormack) so I have a chance to review them. And many thanks in advance for your hard (and creative) work.

## End of Module 3: Managing the Sources of Innovation

**Module 4: Designing Innovation Networks**

[01] 10:05AM Thu, Nov 18, Hawes Hall 201

[02] 11:40AM Thu, Nov 18, Hawes Hall 201

**TOPIC**

Sensing & Responding to Uncertainty

**MATERIALS**

Siemens ShareNet: Building a Knowledge Network (603036)



A Network of Invention (F0404C) (Optional)



Kaihla, Paul. "The Matchmaker in the Machine." Business 2.0, Jan/Feb 2004. (Optional)

**ASSIGNMENT**

The case describes the development of ShareNet, an innovative knowledge management initiative that is used in Siemens telecommunications group(ICN). In July 2002, ShareNet's managers face some difficult decisions with regard to the future of the initiative, brought about by the downturn in the industry and the subsequent need to cut costs. Please answer the following questions:

1. What are the difficulties associated with developing knowledge management systems. Why do such efforts seldom succeed?
2. What has made ShareNet so successful? What are the biggest challenges it faces going forward? How should these be addressed?
3. Should ICN's divisions be charged to use ShareNet? Why/why not?
4. What is the Return on Investment for ShareNet? I will ask several people to share their calculations in class :-)

[01] 10:05AM Wed, Dec 1, Hawes Hall 201

[02] 11:40AM Wed, Dec 1, Hawes Hall 201

## TOPIC

Innovation, Uncertainty and Firm Boundaries

## MATERIALS



Red Hat and the Linux Revolution (600009)

## ASSIGNMENT

The case describes the evolution of the Linux operating system and open-source software in general. In August 1999, Red Hat, the leading distributor of Linux, must decide how to use the funds from its recent IPO, specifically with regard to future development efforts.

Please consider the following questions:

1. What is your assessment of open-source software? Why does it exist? What are the limits to its application?
2. Should Red Hat develop applications? If so, should these be "open source"?
3. How can Red Hat best exploit the opportunity created by open source software? What are the biggest challenges it faces?

[01] 10:05AM Thu, Dec 2, Hawes Hall 201

[02] 11:40AM Thu, Dec 2, Hawes Hall 201

## TOPIC

Innovation, Uncertainty and Firm Boundaries

## MATERIALS

 D-Wave Systems: Building a Quantum Computer (604073)

 [What is a Quantum Computer?](#)

 [How do you Build One?](#)

 [Which Technology Will Win?](#)

 [How Long Until Commercialization?](#)

 [Scientific Collaboration](#)

 Ricadela, Aaron. "Quantum's Next Leap." Information Week, May 10, 2004. (Optional)

 [Kaihla, Paul. "Quantum Leap." Business 2.0, July 14, 2004. \(Optional\)](#)

You can access the article only if you have a subscription to the magazine.

## ASSIGNMENT

The case describes a start-up to develop a quantum computer. Please answer the following questions:

1. Evaluate D-Wave's progress as a venture.
2. Why do scientists collaborate with D-Wave? What does D-Wave get in return?
3. Should D-Wave centralize its R&D activities? If not, *when* should this step be taken?
4. As CEO of D-Wave, what concerns do you have going forward? As a partner of DFJ, how do your concerns differ?

*The five video clips come from an interview with Professor Seth Lloyd at MIT, who develops theory to underpin the construction of quantum computers. In total, the clips last 20 minutes. They are meant as an aid to understanding this strange field - it is up to you whether you watch them all :-). Cheers, Alan.*

[01] 10:05AM Fri, Dec 3, Hawes Hall 201

[02] 11:40AM Fri, Dec 3, Hawes Hall 201

## TOPIC

Sensing & Responding to Uncertainty

## MATERIALS

 [Intel Outside: Building a Research "SensorNet"](#)

 [Markoff, John. "The Disco Ball of Failed Hopes and Other Tales from Inside Intel." NYT, Nov. 29, 2004. \(Optional\)](#)

 Anderson, Howard. "Why Big Companies Can't Invent." MIT Technology Review, May 2004. (Optional)  
*EC Weeks 3 on Packet*

 [Intel - Capital Website \(Optional\)](#)

 [Intel - Research Website \(Optional\)](#)

 [Intel Slides](#)

## ASSIGNMENT

The case describes the organization of Intel Research - the part of Intel responsible for "exploratory research" that is off the normal silicon roadmap that guides most of the firm's R&D efforts. Please think about the following questions:

1. What trends have brought about the demise of large industrial research facilities like Xerox Parc?
2. Evaluate Tennenhouse's approach to building an Exploratory Research organization - which parts are most important?
3. Should Intel fund projects like PlanetLab and Sensor Networks? How can they capture value from them?
4. How should Tennenhouse measure the performance of the different pieces of his organization?
5. Should Intel do anything about Quantum Computing? If so, what would you recommend?

[01] 10:05AM Wed, Dec 8, Hawes Hall 201

[02] 11:40AM Wed, Dec 8, Hawes Hall 201

## TOPIC

Sensing & Responding to Uncertainty

## MATERIALS

 [Microsoft.Net \(Abridged\) \(605025\)](#)

Please read the abridged version of the case to save yourselves six pages of reading.

 [.Net Home Page \(Optional\)](#)

 [Clip 1 - Knowledge/small business](#)

 [Clip 2 - Consumer](#)

 [Clip 3 - PC Experience](#)

 [Clip 4 - Health Care](#)

 [.NET Slides](#)

## ASSIGNMENT

**Be sure to read the revised version (dated September 2004) of the Microsoft.NET case.**

The case describes the history of Microsoft, and specifically, the evolution of its ".Net" initiative. The case is set in summer 2000, following .Net's "coming out" party - called Forum 2000. After reading the case, watch the four "user scenario" videos created for Forum 2000, and answer the following questions:

1. What is .Net? Do you think .Net represents an evolutionary or a revolutionary change for Msft?
2. How did .Net come about? What broader lessons do you think .Net provides on how major technical shifts emerge in organizations?
3. How should this initiative be managed moving forward? Be explicit about who should run it, and how it should be run. For example, would you spin it out to a separate organization? Why/why not?
4. If you were in charge, what would be your major concerns at this point?

**End of Module 4: Designing Innovation Networks****Module 5: Capstone Case Discussion**

[01] 10:05AM Thu, Dec 9, Hawes Hall 201

[02] 11:40AM Thu, Dec 9, Hawes Hall 201

**TOPIC**

Capstone Case Discussion

**MATERIALS**

Reinventing the Automobile: General Motor's AUTOmomy Project (604064)



Hakim, Danny. "A Fuel-Saving Proposal from your Automaker: Tax the Gas." New York Times, April 18, 2004.

**ASSIGNMENT**

The case describes GM's program to develop a hydrogen fuel cell powered vehicle - a fundamental technological transition which promises to transform the automobile industry. In early 2003, VP Larry Burns is faced with some critical issues regarding the future of the program, including how to resolve remaining technical uncertainties, set investment priorities and address competitive concerns.

1. What is your evaluation of GM's strategy and organization for exploring hydrogen fuel cell powered vehicles? What are the key elements of this strategy?
2. What explains the different approaches to this technology among GM's competitors (for example, in technology choices, in make/buy decisions, in levels of investment, in overall enthusiasm)?
3. Should Burns push the approach to hydrogen fuel cells embodied in AUTOmomy or something more incremental? What are the main challenges he faces with either approach? How should he handle these challenges?
4. Should the government play a role in this story? How/why?

**End of Module 5: Capstone Case Discussion**

[01] 10:05AM Fri, Dec 10, Hawes Hall 201

[02] 11:40AM Fri, Dec 10, Hawes Hall 201

## TOPIC

Course Wrap-Up

## MATERIALS



[MIPD Feedback Poll](#)



[MIPD Wrap-up Slides](#)

## ASSIGNMENT

Look back through the material we have covered this semester. Spend sixty seconds thinking about the main lessons you took away from each class. Spend five minutes arranging these lessons into broader themes. What are the key themes that emerge? What are the connections between these themes?

What organizational challenges face firms wishing to embrace uncertainty? What personal challenges face managers wishing to embrace uncertainty? How can we overcome these challenges?

How well do the themes apply to other situations/contexts? How would you apply them at a personal level?

In order for future students to benefit from your experiences and our experiments, please answer the class poll.

[01] 11:30AM Fri, Dec 10, Hawes Hall 201

[02] 1:05PM Fri, Dec 10, Hawes Hall 201

## TOPIC

Final Exam

## MATERIALS



[Exam Guidelines](#)



[Exam Template](#)

## ASSIGNMENT

Early submissions are highly encouraged!