

MOT 6106: Processes of Technological Innovation

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COURSE OVERVIEW:

Welcome to the course on Innovation Processes! In today's rapidly evolving world, the ability to innovate is critical for the success and growth of organizations. This course is designed to equip you with essential knowledge and skills to navigate the complex landscape of innovation. From collaborative idea generation to effective idea selection, managing product portfolios, terminating unfeasible ideas, and creating prototypes – we will delve into each crucial aspect of the innovation journey.

Innovation is not a luxury; it's a necessity. As industries become more competitive, the ability to generate fresh ideas and, arguably more importantly, the capacity to turn these ideas into successful innovations can determine the fate of large companies and startups alike. By understanding the processes behind collaborative idea generation, effective idea selection, and strategic portfolio management, you'll be better prepared to drive innovation within your organization and allocate resources more effectively within and outside the organization.

Whether you're a seasoned professional seeking to enhance your innovation skills or someone new to the field, this course offers valuable insights applicable across industries. Join us to explore methodologies for identifying promising ideas, making informed choices about which concepts to pursue, managing resources efficiently, recognizing when to pivot or terminate projects, and creating tangible prototypes.

Each class session will involve a combination of mini-case discussions, in-class exercises and simulations, and model-based analyses of the innovation process. It is vital that you come ready to actively engage in the activities and share your experiences and perspectives with others in the classroom!

The rest of the syllabus outlines the topics we intend to cover in each session. However, we may take detours from this outline if expanding the scope or depth will be valuable for the class.

COURSE SCHEDULE

Session I: Generating Ideas

In this session, we will look at how you can generate meaningful ideas. We will do an in-class exercise to generate and discuss ideas.

In-class Team Exercise: Innovation and Design Challenges

Required readings!

- a) Griffin A., and Hauser J. R. 1993. "The Voice of the Customer", Marketing Science, pp. 1-27
- b) Lynn G. S., J. G. Morone, and A. S. Paulson, "Marketing and Discontinuous Innovation: The Probe-and-Learn Process" California Management Review

Optional readings:

- a) Rayport J. F. and Leonard-Barton D. "Spark Innovation Through Empathic Design" Harvard Business Review November-December 1997, 75 (6), 102-113
- b) Jon Kolko. "Design Thinking Comes of Age" Harvard Business Review September 2015, 93 (9), 66-71

Session II: Managing uncertainty in Innovation and Product Development

The goal of this session is to dig into the nature of uncertainty in innovation and identify strategies to deal with and embrace the risks.

Case Study: Dragonfly: The Development of the Uninhabited Aerial Vehicle

Preparation Questions:

- a) Would you advise Bob Lake to pursue the RFP?
- b) What are the PM challenges in Dragonfly?

Readings:

- a) Ramachandran, K. A Brief Introduction to Project Planning and Management. The Critical Path Method

Optional Readings:

- b) Adler P., Mandelbaum A., Nguyen V. And Schwerer E. "Getting the Most out of Your Product Development Process," Harvard Business Review March-April 1996;
- c) DeMeyer A., C. H. Loch, and M. T. Pich "Managing Project Uncertainty: From Variation to Chaos", Sloan Management Review, 43 (2), Winter 2002, 60-67
- d) Dahan and Mendelson. An Extreme-Value Model of Concept Testing. Management Science, 2001.

Session III: Testing and Learning in Product Development

In this session, we will explore frameworks to understanding how to test ideas.

¹ The optional readings are also accessible through the Georgia Tech's library databases.

Case Study: Product Development at Dell

Preparation Questions:

- a) Which battery option should Holliday's team select? NiHi or LiOn?
- b) Or should they defer the decision until later? What are the pros and cons?

Case Study: America's Cup in 2013: Oracle Team USA vs. Emirates Team New Zealand (A)

Preparation Questions:

- a) Should Oracle Team USA keep refining its current technology called "skimming", or should it pivot towards "foiling" (flying)?
- b) What are the pros and cons of the two approaches?

Readings:

- a) Wang, Rahmani, Ramachandran. Advising Entrepreneurs: Optimal Recommendation of Alternatives

Session IV: Growth, Risk and Innovation

In this session, we will learn how to select projects with growth and long-term learning considerations.

In-Class Team Exercise: The Product Development Challenge

Case Study: Innovation at Cooper Lighting 2.0

Preparation Questions:

- a) What prompted Cooper to create a new NPD process? What are most important features of the new NPD process?
- b) How does Cooper measure success in NPD? What are your thoughts?
- c) What are Cooper's current issues? How can they solve them?

Case Study: Amylin Pharmaceuticals: Innovation Driven Growth

Preparation Questions:

- a) Should Amylin remain a Diabetes company? Or, should Amylin develop a drug for obesity?
- b) How important is "growth" for Amylin? What kinds of risks does Amylin face with respect to its product development strategy?

Readings:

- b) Bhaskaran, Erzurumlu, Ramachandran. Sequential Innovation by Start-Ups: Balancing Survival and Profitability, M&SOM 2021
- c) Sosa M. E., Eppinger S. D., and Rowles C. M. "Are Your Engineers Talking to One Another When They Should?" Harvard Business Review November 2007

PERFORMANCE EVALUATION:

The course grade will be based on the following elements:

| Item | Weight |
|--|-------------|
| Classroom: Readiness and Leadership | 40% |
| Classroom Participation – Exercises | 10% |
| Virtual Session (Team) | 25% |
| Final: Paper or Case Report (Individual) | 25% |
| Total | 100% |

CLASS PARTICIPATION AND INDIVIDUAL NORMS:

Since each faculty member has somewhat different expectations I should clarify a few common issues at the outset:

1. Please try to let me know in advance if you must miss a class. If you do miss a class, please find out from a classmate what additional assignments might have been made, and what handouts you may have missed.
2. Preparation for class is critical. That is particularly important on the days when your group is leading the discussion. Since I frequently call on individuals whose hands are not raised, you should let me know before class if an emergency has made it impossible for you to be prepared adequately for that class.
3. For purposes of general class preparation, group work is acceptable and encouraged. However, at no time should notes or papers from other courses where these materials might have been taught be used.
4. The easiest and most reliable way to contact me is by sending an email. To ensure that your email receives my immediate attention, please use a meaningful subject line with reference to the course number/title.

VIRTUAL SESSION (TEAM)

Project scope: each team is required to analyze a new service/product project initiative that you are currently undergoing within the organization of one of the team members. You should aim to analyze the performance of the particular project from several angles that we will cover in class such as: (i) Novelty of business model? (ii) Potential risks and risk mitigation plans? (iii) Process structural and execution challenges? (iv) Stakeholder alignment and conflict? Finally, your team should try to conclude with some proposals for corrective/improvement action.

Deliverable details:

- (i) Summarize the situation, your main findings, and how ideas from the class apply to the situation in 5 slides.
- (ii) Present an “anonymized” version of this for sharing with class. This will be posted on the class page.
- (iii) **Deadline:** last day of class

Team structure: I propose we use the team structures already predetermined in the program. In the last day of classes I will distribute a peer assessment report to ensure that team members evaluate their peers' contribution to the project.

FINAL EXAM (INDIVIDUAL)

Instructions will be provided through canvas.