

Carleton University

Technology Innovation Management (TIM)

TTMG5101 Integrated Product Development Winter 2012

INSTRUCTOR

Professor Steven Muegge
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OFFICE HOURS

The instructor is available through email at any time. Office hours can be arranged by appointment.

TIME AND PLACE

4359 Mackenzie Building (ME4359) and online (details below), Fridays, 6pm – 9pm.

COURSE OBJECTIVES

TTMG5101 examines how to profitably develop products fast in large and small technology businesses, and prepares students to undertake thesis and project research related to product development. Topics covered with the course include problem definition, hypothesis formation, methods to collect and examine data, and the identification of insights relevant to academics and practitioners.

Key research questions addressed include the following:

- (1) What do you need to know and do to successfully lead fast-to-market product teams?
- (2) What are the exemplary practices that are available to reduce product development cycle time?
- (3) What issues are key to fast-to-market product development?

TARGET AUDIENCE

The course addresses the needs of graduate students in the Technology Innovation Management (TIM) program – both the thesis option (M.A.Sc.) and project option (M.Eng.). Students should have previously completed TTMG5001 (Management Principles for Engineers), TTMG5002 (Telecommunications Technology), and be familiar with (1) how to access the scholarly literature in the TIM domain, (2) how to conduct a TIM literature review, and (3) articles on product development and technical entrepreneurship that were previously assigned in TTMG5001.

BENEFITS

Students will benefit from

- (1) understanding the research literature on fast-to-market product development,
- (2) developing skills in making, assessing and communicating recommendations on how to reduce cycle-time so as to introduce products profitably, and
- (3) understanding the role of open environments, communities, platforms, and business ecosystems in fast-to-market product development.

CLASS SESSIONS

Class sessions will be conducted as a combination of interactive discussions, lectures, student presentations, and workshops. Students located in Ottawa are normally expected to be physically present in the classroom. Students located outside of Ottawa will participate online.

There will be assigned readings and/or tasks for each weekly class session.

During the student group presentation sessions, groups will make short presentations on their assignments (maximum 10 minutes). Each group decides who presents what and the order. Before 5 pm the day prior to when presentations are due, each group will distribute to all members of the class the slides to be presented the next day. No exceptions. Presentations will be followed by clarification questions and discussions that involve the entire class.

An excellent group presentation is no more than 10 minutes long, and concise, crisp and insightful.

Classes are delivered both in-class and online. To join online, go to the Technology Innovation Management conference server, type your name in the "Full Name" field, select room "TTMG 5101" with password "student", and click "Join". The TIM conference server is here: <http://present.carleton.ca>

For the audio portion of the online class, call 613-366-1985 (local) or 866-964-7085 (toll-free) from a telephone and enter conference room 85101 on the telephone keypad when prompted. Alternatively, you can click the headphones icon in the web conference for a VoIP connection through your computer (often lower audio quality); if you use a VoIP connection, it is essential that you wear a high-quality headset. Detailed instructions and video tutorials on joining and using the online classroom are available from the BigBlueButton website: <http://www.bigbluebutton.org/content/videos>

Course material will be made available on the Moodle learning content management system here: <http://cms.sce.carleton.ca>.

You should visit Moodle frequently throughout the course. The instructor aims to make a version of the slides available before every class, however, they may be updated as a result of in-class discussion. Please check for updates after class. Contact the instructor if you need a Moodle account.

EVALUATION

Students are required to attend all classes, complete the assigned reading prior to each class, complete two course assignments, actively participate in class discussions and other tasks assigned by the instructor, and write a final examination.

To determine the course grade, these components will be weighted as follows:

- 20% Class participation (individual)
- 30% Assignment 1 (group)
- 20% Assignment 2 (group)
- 30% Final examination (individual)

Assignments submitted late and presentations not made will receive a grade of zero.

Class participation

Students are expected to actively contribute to the learning environment of the course. Participation will be evaluated in terms of frequency and quality of contribution to class discussions, written summaries of assigned articles (more information below), constructive feedback provided on the work of classmates, and other contributions to the learning environment.

Students will prepare and share brief (100- to 250-word) written summaries of two assigned articles. Each summary will identify three insights relevant to managers and three insights relevant to academics. Summaries will be shared prior to the class for which the article is assigned. Assignment of who will summarize which articles will occur collaboratively early in the course (in session 2). There will be no summaries assigned for session 1 or session 2: the first summaries will be due for session 3.

Assignment 1: IPD in an era of open innovation

This is a group assignment. Groups can have up to three members.

Each group of students will

- (1) select a product development practice associated with fast-to-market product development,
- (2) review the research literature on that practice, including the theory and evidence for relationships with other product development constructs, contingencies and contextual factors, and mediating variables, and the strengths and weaknesses of the extant literature,
- (3) discuss the practice in the context of open innovation, and
- (4) prepare a set of recommendations regarding interesting research questions and outline a research program that could be undertaken to answer those questions.

The specific deliverables for assignment 1 are (1) an in-class presentation delivered in session 11, and (2) a written report delivered on the same day as the final exam.

Assignment 2: Product opportunity

This is a group assignment. Groups can have up to three members.

Each group of students will

- (1) describe a product opportunity (i.e., a “job-to-be-done” and a user scenario),
- (2) refine the product opportunity to a value opportunity (identifying stakeholders, stakeholder value propositions, and general product attributes),
- (3) outline a plan of action to effectively engage stakeholders to refine and strengthen the product opportunity and value opportunity, and
- (4) prepare a set of recommendations for fast-to-market product development.

The specific deliverables for assignment 2 are (1) an in-class presentation delivered in session 12, and (2) a written report delivered on the same day as the final presentation.

Style guides for presentations and written reports will be provided in class. Two interactive assignment workshops in session 6 (assignment 1) and session 8 (assignment 2) will help students identify appropriate topics and iteratively improve their work.

Final exam

The final exam will be a take-home examination, posted on the last day of class and due one week later, to be delivered to the instructor as specified in class. The final exam is an individual effort.

PAUL MENTON CENTRE

Students with disabilities requiring academic accommodations in this course are encouraged to contact a coordinator at the Paul Menton Centre (PMC) for Students with Disabilities to complete the necessary letters of accommodation. After registering with PMC, make an appointment to meet and discuss your needs with your instructor at least two weeks prior to requiring accommodation for assignments or presentations. This is necessary in order to ensure sufficient time to make the necessary arrangements.

PLAGIARISM

Plagiarism, including copying and handing in for credit someone else's work, is a serious instructional offense that will not be tolerated. Please refer to the section on instructional offenses in the Graduate Calendar for additional information. Plagiarism is against the TIM culture. A case of plagiarism will be referred to the Chair of the department and the Carleton University Ethics Committee. The instructor will not deal with the matter directly. The University has clear processes to deal with students who are suspected of plagiarism.

CALENDAR (tentative) – changes may be announced during the term

	Date	Topic	Assigned Reading	Notes
1	Friday January 6	Introductions	TTMG5101 course syllabus.	
2	January 13	IPD and product development decisions	Schilling & Hill (2008), Gerwin & Barrowman (2002), Krishnan & Ulrich (2001), Durisin et al. (2010).	
3	January 20	IPD practices	Cooper (1999), Clark & Wheelwright (1992), Dougherty (1992), Barczak et al. (2009).	
4	January 27	Flexibility	Brown & Eisenhardt (1997), MacCormack & Verganti (2003), Highsmith (2004), Cusumano et al. (2009), Lee & Xia (2010)	
5	February 3	Open innovation and business models	Chesbrough & Rosenbloom (2002), Chesbrough & Appleyard (2007), West & Bogers (2011), Schweitzer et al. (2011).	
6	February 10	Assignment 1 workshop		Presentations
7	February 17	Product concepts and users	Christensen et al. (2007), Callahan & Lasry (2004), Eisenberg (2011), Hopkins et al. (2011).	
	February 24	Winter break (February 20-24): no classes at Carleton this week.		
8	March 2	Assignment 2 workshop		Presentations
9	March 9	Architecture, platforms, ecosystems, communities.	Laseter & Kerber (2008), Baldwin & Clark (2006), West & O'Mahony (2008), Snow et al. (2011).	
10	March 16	Special topics	To be announced	
11	March 23	Assignment 1 presentations.		
12	March 31	Assignment 2 presentations. Assignment 2 report is due. Final exam distributed.		
	April 10	Final exam due.		

REQUIRED READING

Additional readings may be assigned during the term.

To access the required journal articles in electronic form, go to the Carleton University Library Catalogue (<http://catalogue.library.carleton.ca>), enter the name of the journal (not the article) in the "Title" field, select "E-Journals" from the pull-down menu, and click "Search". When the catalogue entry for the journal is displayed, click the link below "Connect to Web Resource", and then enter your student card barcode number and PIN when prompted.

Session 2: IPD and product development decisions

Schilling, M., & Hill, C. 1998. Managing the new product development process: Strategic imperatives. *Academy of Management Executive*, 12(3): 67-81.

Gerwin, D., & Barrowman, N. 2002. An evaluation of research on integrated product development. *Management Science*, 48(7): 938-953.

Krishnan, V., & Ulrich, K. 2001. Product development decisions: A review of the literature, *Management Science*, 47(1): 1-21.

Durisin, B., Calabretta, G., & Parmeggiani, V. 2010. The intellectual structure of product innovation research: A bibliometric study of the *Journal of Product Innovation Management*, 1984–2004. *Journal Of Product Innovation Management*, 27(3): 437-451.

Session 3: IPD practices

Cooper, R.G. 1999. The invisible success factors in product innovation. *Journal of Product Innovation Management*, 16: 115-133.

Clark, K.B., & Wheelwright, S.C. 1992. Organizing and leading 'heavyweight' development teams. *California Management Review*, Spring: 9-28.

Dougherty, D. 1992. Interpretive barriers to successful product innovation in large firms. *Organization Science*, 3(2): 179-202.

Barczak, G., Griffin, A., & Kahn, K. B. 2009. Perspective: Trends and drivers of success in NPD practices: Results of the 2003 PDMA Best Practices Study. *Journal Of Product Innovation Management*, 26(1): 3-23.

Session 4: Flexibility

Brown, S. L., & Eisenhardt, K. M. 1997. The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. *Administrative Science Quarterly*, 42(1): 1-34.

MacCormack, A., & Verganti, R. 2003. Managing the source of uncertainty: Matching process and context in software development. *Journal of Product and Innovation Management*, 20(3): 217-232.

Highsmith, J. 2004. *Agile project management: Creating innovative products*, Boston, MA: Addison Wesley, 170-181.

Available as an ebook (<http://catalogue.library.carleton.ca/record=b2918884~S9>) from the Carleton Library. We cover only the section titled "Practice: Low-cost change" in ch. 7, pp. 170-181. There is also a second edition (2009), which is revised and expanded with new material. This assigned reading is from the first edition, which covers the assigned content more concisely.

Cusumano, M. A., MacCormack, A., Kemerer, C. F., & Crandall, W. 2009. Critical decisions in software development: Updating the state of the practice. *IEEE Software*, 26(5): 84-87.

Lee, G., & Xia, W. 2010. Toward agile: An integrated analysis of quantitative and qualitative field data on software development agility. *MIS Quarterly*, 34(1): 87-114.

Session 5: Open innovation and business models

Chesbrough, H.W., & Rosenbloom, R.S. 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change*, 11(3): 529-555.

Chesbrough, H. W. & Appleyard, M.M. 2007. Open innovation and strategy. *California Management Review*, 50(1): 57-76.

West, J., & Bogers, M. 2011. Profiting from external innovation: A review of research on open innovation. Social Sciences Research Network working paper #1949520.
Available at SSRN: <http://ssrn.com/abstract=1949520>.

Schweitzer, F. M., Gassman, O., & Gaubinger, K. 2011. Open innovation and its effectiveness to embrace turbulent environments. *International Journal Of Innovation Management*, 15(6): 1191-1207.

Session 7: Product concepts and users

Christensen, C. M., Anthony, S., Berstell, G., & Nitterhouse, D. 2007. Finding the right job for your product. *Sloan Management Review*, 48(3): 38-47.

Callahan, J., & Lasry, E. 2004. The importance of customer input in the development of very new products. *R&D Management*, 34(2): 107-120.

Eisenberg, I. 2011. Lead-user research for breakthrough innovation. *Research Technology Management*, 54(1): 50-58.

Hopkins, M. M., Tidd, J., Nightingale, P., & Miller, R. 2011. Generative and degenerative interactions: Positive and negative dynamics of open, user-centric innovation in technology and engineering consultancies. *R&D Management*, 41(1): 44-60.

Session 9: Architecture, platforms, ecosystems, communities

Laseter, T., & Kerber, R. 2008. Launch and learn, *Strategy + Business*, 50(Spring): 1-6.

Baldwin, C., & Clark, K. 2006. The architecture of participation: Does code architecture mitigate free riding in the open source development model? *Management Science*, 52(7): 1116-1127.

West, J., & O'Mahony, S. 2008. The role of participation architecture in growing sponsored open source communities. *Industry and Innovation*, 15(2): 145-168.

Snow, C. C., Fjeldstad, Ø. D., Lettl, C., & Miles, R. E. 2011. Organizing continuous product development and commercialization: The collaborative community of firms model. *Journal Of Product Innovation Management*, 28(1): 3-16.

Session 10 Special topics

To be announced in class.